



OPEN Global citizenship identity mediates the relationship of knowledge, cognitive, and socio-emotional skills with engagement towards global issues

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The UN Sustainable Development Goals (SDGs) provide a unified framework to address interconnected global issues, emphasizing the need for collective action across all sectors of society to achieve a sustainable future for all. In this paper, we empirically investigate how knowledge (awareness of global issues), cognitive skills (critical inquiry), and socio-emotional skills (cognitive empathy) relate to engagement towards global issues, and whether global citizenship identification mediates these relationships. Mediation analysis of data from 249 participants revealed that both awareness of global issues and cognitive empathy directly predict higher engagement levels. In contrast, no direct effect of critical inquiry was observed. Global citizenship identification significantly mediated the relationships between all three predictors and engagement: accounting for 70.7% of the effect of critical inquiry, 39.9% of the effect of awareness, and 33.6% of the effect of cognitive empathy. Our findings highlight that global citizenship identification plays a crucial role in translating knowledge and skills into active engagement. The results highlight the potential effectiveness of identity-based interventions in fostering more engaged communities and advancing efforts toward achieving the SDGs.

The UN Sustainable Development Goals (SDGs) represent a collective blueprint designed to tackle pressing global challenges, which include climate change, international conflicts, poverty, and socio-economic inequalities¹. The SDGs recognize that the issues we face today are interconnected and global in nature, transcending borders, cultures, and economic systems, and thus require a united effort². However, recent data reveals setbacks in SDG progress, underscoring the need for urgent action both, as individuals and as a collective, since these goals are not merely targets for particular nations or regions. They are a call to action for humanity, underscoring our shared responsibility to ensure a sustainable future for all³. This collective responsibility is crucial to the concept of global society—one in which the well-being of any group is intrinsically linked to the well-being of all. Thus, it is important to engage all sectors of society—including governments, institutions, businesses, civil society, and individuals—to address these global challenges⁴.

As part of the endeavor to empower individuals and communities to take action toward global issues, a number of programs have been designed under the umbrella of Global Citizenship Education (GCED, as outlined in SDG 4.7). These programs focus on developing individual skills in learners to raise awareness of global issues and promote a commitment to sustainability and collective well-being¹. The content and methodologies of such programs primarily focus on developing evidence-based knowledge about the world, as well as cognitive skills (e.g., critical thinking) and socio-emotional skills (e.g., empathy)^{5–7}. In the paragraphs below, we review research on the extent of each of these to influence individuals towards engagement with global issues.

Knowledge-based awareness about the world plays a crucial role in challenging misinformation and stereotypes, and mitigating intolerance and oversimplified portrayals of other countries, people and the global arena⁶. In this study, we focus on the notion of *awareness of global issues*, which refers to individuals' perceptions of familiarity and ability to explain complex social, environmental, economic, and political problems, such as climate change, international conflicts, human rights violations, or socio-economic inequalities⁶. Research has shown that when people inform themselves about the interconnectedness and implications of these issues on the planet,

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ecosystems, and present and future generations—human and non-human—they are likely to feel a sense of responsibility to act for the betterment of the world, and engage in helping behaviors (e.g. donating)⁸. However, this evidence is not without its inconsistencies. For example, a study found that adolescents who completed a course on social justice issues (e.g. homelessness, poverty, world hunger, humanitarian aid, and immigration) showed less support for educational equity, compared to a control group. This counterintuitive outcome was attributed to heightened fears among the students about the possibility of becoming poor or homeless, which resulted in a stronger inclination to protect their own privilege⁹.

Cognitive and socio-emotional skills improve an individual's capacity to process, understand, and adapt to complex social information and are frequently included in education programs.

Critical inquiry encompasses the active openness to new ideas, the critical evaluation of these ideas, and the adjustment of one's thinking based on compelling evidence¹⁰. This cognitive process allows for the deconstruction and reconstruction of concepts and ideas, leading to reasoned conclusions. As a result, critical inquiry enhances awareness of socio-politically motivated maneuvers (e.g., fake news) and supports rational and logical decision making¹¹. Research shows that teaching critical global consciousness can increase student understanding of global issues¹². However, while critical inquiry facilitates a deeper understanding of complex issues, it may not alone drive the engagement in responsive actions.

Empathy has been conceived of as the ability to experience an emotional response congruent with the perceived welfare of another person¹³. In particular, *cognitive empathy* involves perceiving others' perspective and emotions, recognising them and distinguishing them from one's own experiences, which can prompt positive action towards the other person or issue¹⁴. Research indicates that *cognitive empathy* is particularly effective in alleviating other's distress, more so than affective empathy, which is the ability to share others' emotions through emotional contagion¹⁵. It has been found that individuals with higher levels of empathy, particularly cognitive empathy, are more likely to engage in responsive actions addressing global issues^{16–18}. For example, a positive correlation was found between American students' empathy for Iraqi people and their support for humanitarian aid, such as providing food, medical assistance and shelter¹⁹. However, the empathetic experience is significantly influenced by perceived similarities or differences in group identity. Individuals tend to exhibit greater empathy towards those who share the same group identity compared to those from different groups^{20,21}. Also, while empathy has been associated with prosocial attitudes and behaviors, it may not necessarily translate into frequent involvement in civic life (e.g., signing petitions, joining protests, voting, volunteering)²². These actions often require additional group factors, including a sense of social responsibility among individuals²³.

While the above review shows that both knowledge and skills influence individuals to engage in activities addressing global issues, there is little empirical evidence to support it. Therefore, the first goal of this study was to empirically explore the relationship between the individual factors defined above, and engagement towards global issues.

In recent years there has also been emerging research to suggest that social identities are pivotal in shaping one's sense of responsibility and resulting actions. Individuals who perceive themselves as part of a social group often feel a collective responsibility for the group's welfare, depending on the strength of group identification, the group's size and diversity, and personal values and experiences²⁴. Here we draw attention to all-inclusive identity, also referred to as global citizenship identity.

The role of global citizenship identity

All-inclusive identities involve the sense of identifying, belonging, and caring with a group encompassing all people, either by underlining our belongingness to Humanity or to a worldwide community of global citizens. This concept has gathered increased attention in psychological research over the past decades²⁵. Some theorists propose that an all-inclusive identity is an innate trait that matures in individuals along development (as theories of personality proposed by Adler²⁶, Maslow²⁷, Allport²⁸ and Erikson²⁹). Others perceive an all-inclusive identity as developing through group membership and shared identification with others (for details, see social identity theories and models proposed by Tajfel^{30,31}, Gaertner and Dovidio³²). Research also shows that when individuals expand their view of group identity to encompass all of humanity, they not only exhibit reduced prejudice and discrimination, but also demonstrate greater empathy²⁵. Recent studies have revealed that the terms "global citizen" or "citizen of the world" are commonly used to characterize individuals influenced by various cultures, who belong to a community that extends beyond their nation or culture, who feel responsibilities toward others globally, and who are prepared to navigate in a globalized world^{33,34}. Identifying oneself as a global citizen appears to be a promising avenue for civic engagement within and across borders, as it has been associated with greater intentions to advocate for social justice⁸, involvement in activist causes like peace, human rights, and environmentalism³⁵, and increased intentions to contribute to collective goods³⁶.

The present study

While the significance of inclusive identities is recognized in both the GCED guidelines¹ and academic research^{25,37}, their explicit cultivation is often overlooked in initiatives aimed at fostering engagement towards global issues^{3–7}. This study aims to: 1) investigate how knowledge (e.g., awareness of global issues), cognitive skills (e.g., critical inquiry), and socio-emotional skills (e.g., empathy) are related to engagement towards global issues, and 2) explore whether global citizenship identification mediates these relationships. Thus, we hypothesize that participants with high levels of awareness of global issues (H1), critical inquiry (H2), and cognitive empathy (H3) would demonstrate increased engagement toward global issues, with global citizenship identification serving as a mediating factor. These findings are expected to offer valuable insights and inform initiatives and policies designed to cultivate more engaged communities in support of achieving the SDGs.

Methods

Participants

We collected data from a varied international cohort of adult participants to ensure variability in the dataset and achieve a thorough understanding of how the variables interact within real-world contexts. An *a priori* power analysis was conducted to estimate the sample size needed for the study using G*Power (details presented in Supplementary Material Sect. S1). A sample of 249 participants from 16 countries completed the study. 50.2% of the respondents indicated their country of residence as the US, 39.4% as India, and 10.4% as others (full list of 'other' countries can be found in Table 1). Participants reported a mean age of 35.04 years (SD = 9.06, range: 21–65 years); 57.0% of them identified themselves as male, 42.6% as female, and 0.4% chose not to disclose their gender. Other demographic details, such as their education level and perceived socio-economic status, are summarized in Table 1.

Procedure

Participants for the study were recruited via Amazon's Mechanical Turk in January and February 2023, where they completed an online survey built on Qualtrics in exchange for monetary compensation (US\$1). To minimize forged responses, the survey included various validation items (i.e., robot check, control questions, and open-answer screening; see full survey design in Supplementary Material Sect. S2).

The research adhered to the Ethical Principles of Psychologists and Code of Conduct outlined by the American Psychological Association³⁸, as well as the Declaration of Helsinki. Approval for the research study was obtained from the governing board of UNESCO Mahatma Gandhi Institute of Education for Peace and Sustainable Development, which comprises senior researchers and policymakers. The study did not involve vulnerable populations, and no risks to the participants' well-being were identified. All participants were 18 years of age or older and proficient in English. Voluntary participation was ensured, and informed consent was obtained before commencement. Upon completion, participants were briefed on the specific academic objectives of the study. Responses were collected with strict anonymity and confidentiality.

First, the following self-reported model measures were administered in a randomized order: awareness of global issues, critical inquiry, and cognitive empathy. Next, participants were administered questionnaires on engagement towards global issues, followed by global citizenship identification. Since research suggests that social desirability can undermine the accuracy of the self-report measures³⁹, we measured social desirability as a control variable. Socio-demographic information was collected at the end to avoid stereotype threat. Additional measures were administered but not used in the present study. The full protocol is available in Supplementary Material Sect. S2.

Instruments

The following scales were used in the study and items within them were presented in a randomized order:

Awareness of global issues was measured using 7 items from OECD-PISA's Global Competence Assessment protocol⁶, where participants reported the extent to which they are aware of seven global issues (i.e., they heard

Characteristic	Value
Age (in years), M (SD)	35.04 (9.16)
Gender, <i>n</i> (%)	
Female	106 (42.6%)
Male	142 (57%)
Prefer not to say	1 (0.4%)
Country, <i>n</i> (%)	
USA	125 (50.2%)
India	98 (39.4%)
Others*	26 (10.4%)
Education level, <i>n</i> (%)	
High school	23 (9.2%)
Technical degree	9 (3.6%)
Bachelor's degree	147 (59%)
Graduate degree	70 (28.2%)
Perceived SES, <i>n</i> (%)	
Very difficult to live on present income	12 (4.8%)
Difficult to live on present income	33 (13.2%)
Managing on present income	116 (46.6%)
Living comfortably on present income	82 (33.0%)
Prefer not to say	6 (2.4%)

Table 1. Sample demographics (*n* = 249). *Others = Brazil (8), Canada (2), Dominican Republic (1), France (1), Georgia (1), Iceland (1), Indonesia (2), Italy (3), Philippines (1), Romania (1), Singapore (1), Sri Lanka (1), Venezuela (1), Not listed (2).

about the topic and can explain it), namely climate change and global warming; global health; international conflicts; hunger or malnutrition in different parts of the world; causes of poverty; and equality between genders in different parts of the world. Answers were given using a 4-point Likert-type scale (1 = I have never heard of this to 4 = I am familiar with this and I would be able to explain this well) and were used to construct an index of awareness of global issues (higher mean ratings indicate greater awareness about global issues; $\alpha = 0.73$).

Critical inquiry was measured by 7 items forming the critical openness subscale of the Critical Thinking Disposition Scale (CTDS;⁴⁰). It is used to assess participants' tendency to be actively open to new ideas, critical in evaluating these ideas and modifying one's thinking in light of convincing evidence (e.g., "I usually try to think about the bigger picture during a discussion"; "I sometimes find a good argument that challenges some of my firmly held beliefs"), using a 5-point Likert-type scale (1 = I strongly disagree to 5 = I strongly agree; higher mean ratings reflect greater critical inquiry; $\alpha = 0.73$).

Cognitive empathy was measured by 4 items forming the cognitive empathy subscale of the Interpersonal and Social Empathy Index (ISEI;¹⁴). It was used to assess participants' ability to cognitively process and perceive other's points of view and emotions (e.g., "I can consider my point of view and another person's point of view at the same time"), and to recognise the difference between other's experiences from one's own (e.g., "I can tell the difference between someone else's feelings and my own"), using a 5-point Likert-type scale (1 = Never to 5 = Very frequently/always; higher mean ratings indicate greater cognitive empathy; $\alpha = 0.69$).

Engagement towards global issues was measured by asking participants to report how frequently they engage in activities in their daily lives towards global challenges in general, using 4 items from OECD-PISA's Global Competence Assessment protocol (⁶; e.g., "I reduce the energy I use at home to protect the environment (for example, by turning off the heating, the air conditioning or the lights when leaving a room)"; "I regularly read websites on international social issues (for example, conflicts, human rights)"), using a 5-point Likert-type scale (1 = Never to 5 = Very frequently/always; higher mean ratings reflect greater engagement regarding global issues; $\alpha = 0.68$).

Global citizenship identification was assessed by the Four Item measure of Social Identification (FISI;⁴¹). One item measured social identification with the group of global citizens (i.e., "I identify with global citizens") and three items measured aspects of the self-investment dimension of social identification, namely solidarity with other group members (i.e., "I feel committed to global citizens"), satisfaction with the membership (i.e., "I am glad to be a global citizen") and centrality of group membership (i.e., "Being a global citizen is an important part of how I see myself"), using a 5-point Likert-type scale (1 = I strongly disagree to 5 = I strongly agree; higher mean ratings reflect greater identification as a global citizen; $\alpha = 0.84$).

Social desirability was measured by 8 items forming the impression management subscale of the Balanced Inventory of Desirable Responding Short Form (BIDR-16;⁴², which reflect a tendency to give positively inflated self-descriptions to an audience (e.g., "I don't gossip about other people's business") rated on 5-point Likert-type scale (1 = I strongly disagree to 5 = I strongly agree; higher mean ratings reflect a greater tendency to socially desirable responding; $\alpha = 0.64$).

Statistical analyses

All statistical analyses were performed on R version 4.0.2. After cleaning the dataset, descriptive analyses were performed for the study's main variables. Besides calculating the summary statistics, two-tailed, bivariate Pearson correlations were calculated. The strength of the correlations was determined using Hopkins's recommendations⁴³: trivial (<0.1), small (0.1–0.3), moderate (0.3–0.5), high (0.5–0.7), very high (0.7–0.9) or practically perfect (>0.9).

To test the hypotheses, mediation analysis was conducted with the help of the *mediation* package in R. Prior to the analysis, critical assumptions related to regression modeling were tested. Specifically, to test hypotheses H1, H2, and H3, three individual models were built using the three exogenous variables: *awareness of global issues*, *critical inquiry* and *cognitive empathy*, respectively. In the models, *global citizenship identification* was entered as the mediator, *engagement towards global issues* as the endogenous variable, and *social desirability* as the control variable. This causal direction was decided based on theoretical considerations. Theories in developmental psychology and education suggest that individual traits, such as knowledge and skills, are foundational in shaping one's identity. As individuals gain knowledge and develop skills, they become more aware of their global interconnectedness and responsibilities, which can foster a global citizenship identity⁸. Similarly, research from social identity theories suggest that identity formation is influenced by ongoing interactions with the environment and acquired knowledge. For instance, research indicates that knowledge contribution in communities can lead to the development of social and self-identity through social interaction ties and membership esteem⁴⁴. Environmental identity development is facilitated by interactions, action, and recognition, with diverse interactions playing a crucial role in this social development⁴⁵. Thus, it is plausible that global citizenship identity evolves as a result of increased knowledge and skills.

Since the Sobel test poses several problems such as low statistical power⁴⁶ and assumption of normality of the product of *a* and *b* coefficients⁴⁷, the present study used the bias-corrected and accelerated (BCa) bootstrapping technique⁴⁷, which helped assess both the magnitude and significance of the indirect (mediation) effects. 5,000 resamples of the data were used for bootstrapping and all reported results used an α value of $p = 0.05$. 95% confidence intervals were calculated, and they were considered significant if they did not include a zero.

Results

Descriptive analyses and correlations

Descriptive statistics on and bivariate correlations between measured variables (*awareness of global issues*, *critical inquiry*, *cognitive empathy*, *engagement towards global issues*, *global citizenship identification* and *social desirability*) are presented in Tables 2 and 3, respectively. Variables were not distributed normally but demonstrated sufficient

Variable	α	Min	Max	M	SD	Skewness	Kurtosis	SW
Exogenous								
Awareness of global issues	0.73	1.86	4.0	3.14	0.45	-0.13	2.53	$p < 0.05$
Critical inquiry	0.73	2.57	5.0	4.06	0.48	-0.17	2.42	$p < 0.05$
Cognitive empathy	0.69	2.00	5.0	3.98	0.58	-0.34	2.94	$p < 0.05$
Endogenous								
Engag. towards global issues	0.68	1.00	5.0	3.63	0.78	-0.77	3.53	$p < 0.05$
Mediating								
Global citiz. identification	0.84	1.00	5.0	3.99	0.69	-0.83	4.14	$p < 0.05$
Control								
Social Ddesirability	0.64	1.00	4.5	2.79	0.61	-0.43	3.47	$p < 0.05$

Table 2. Descriptive statistics on measured variables ($n = 249$). SW = Shapiro–Wilk Test.

Variable	1	2	3	4	5
1—Awareness of global issues	–				
2—Critical inquiry	0.49**	–			
3—Cognitive empathy	0.39**	0.48**	–		
4—Engagement towards global issues	0.30**	0.28**	0.35**	–	
5—Global citizenship identification	0.32**	0.51**	0.33**	0.46**	–
6—Social desirability	0.18**	0.21**	0.19**	0.09	0.17**

Table 3. Bivariate Pearson correlations (2-tailed) between measured variables ($n = 249$). * $p < 0.05$, ** $p < 0.01$.

reliability (as noted in Table 2). The relationship between variables was mostly linear, represented by weak and moderate Pearson correlations (as seen in Table 3).

Mediation analysis

The following model specifications were created for the study: Model 1 (to examine the mediating effect of *global citizenship identification* on the relationship between *awareness of global issues* and *engagement towards global issues*); Model 2 (to examine the mediating effect of *global citizenship identification* on the relationship between *critical inquiry* and *engagement towards global issues*), and Model 3 (to examine the mediating effect of *global citizenship identification* on the relationship between *cognitive empathy* and *engagement towards global issues*). *Social desirability* was entered as the control variable in all the models. All models converged normally and coefficients for the three models are reported in Table 4.

Model 1

We hypothesized that participants high in awareness of global issues would be more engaged in global issues, and these effects would be mediated by global citizenship identification (H1). Through bootstrapping, it was found that the total effect of *awareness of global issues* on *engagement towards global issues* was significant [Total Effect, TE: $ab + c' = 0.554$, 95% BCa CI = (0.362, 0.750), $p < 0.01$]. Out of this, the direct effect of *awareness of global issues* on *engagement towards global issues* was also found to be significant [Average Direct Effect, ADE: $c' = 0.333$, 95% BCa CI = (0.113, 0.550), $p < 0.01$], as well as the causal mediation effect of *awareness of global issues* on *engagement towards global issues* through *global citizenship identification* [Average Causal Mediation Effect, ACME: $ab = 0.221$, 95% BCa CI = (0.129, 0.350), $p < 0.01$]. The mediation effect accounted for 39.9% of the total effect and hypothesis 1 was supported. See Fig. 1 for more details.

Model 2

We hypothesized that participants high in critical inquiry would be more engaged in global issues, and these effects would be mediated by global citizenship identification (H2). For model 2, results of bootstrapping indicated that the total effect of *critical inquiry* on *engagement towards global issues* was significant [TE: $ab + c' = 0.512$, 95% BCa CI = (0.319, 0.690), $p < 0.01$]. Decomposing the total effect demonstrated that while the direct effect of *critical inquiry* on *engagement towards global issues* was not significant [ADE: $c' = 0.149$, 95% BCa CI = (-0.074, 0.350), $p > 0.05$], the causal mediation effect through *global citizenship identification* was significant [ACME: $ab = 0.362$, 95% BCa CI = (0.233, 0.530), $p < 0.01$]. The mediation effect accounted for 70.7% of the total effect and hypothesis 2 was partially supported. See Fig. 2 for more details.

Model 3

We hypothesized that participants high in cognitive empathy would be more engaged in global issues, and these effects would be mediated by global citizenship identification (H3). For model 3, it was found that the total effect of *cognitive empathy* on *engagement towards global issues* was significant [TE: $ab + c' = 0.513$, 95% BCa CI = (0.329, 0.700), $p < 0.01$]. Out of this, the direct effect of *cognitive empathy* on *engagement towards global*

Antecedent	Consequent									
	M (Global citizenship identification)					Y (Engagement towards global issues)				
		Coeff	SE	p-value	Model Fit	Coeff	SE	p-value	Model Fit	
<i>Model 1</i>										
X (Awareness of Global Issues)	<i>a</i>	0.449	0.093	<.01	F (2, 246) = 15.90, <i>p</i> < .01	<i>c'</i>	0.333	0.099	<.01	F (2, 246) = 31.38, <i>p</i> < .01
M (Global Citizenship Identification)	–	–	–			<i>b</i>	0.491	0.065	<.01	
C (Social Desirability)		–0.139	0.069	<.05	R ² = 11.45%		0.251	0.071	<.01	R ² = 27.76%
Intercept	<i>i_M</i>	2.965	0.379	<.01			<i>i_Y</i>	–0.071	0.431	
<i>Model 2</i>										
X (Critical Inquiry)	<i>a</i>	0.718	0.081	<.01	F (2, 246) = 44.77, <i>p</i> < .01	<i>c'</i>	0.149	0.106	<.01	F (2, 246) = 27.28, <i>p</i> < .01
M (Global Citizenship Identification)	–	–	–			<i>b</i>	0.504	0.072	<.01	
C (Social Desirability)		–0.076	0.063	>.05	R ² = 26.69%		0.236	0.072	>.05	R ² = 25.04%
Intercept	<i>i_M</i>	1.284	0.406	<.01			<i>i_Y</i>	0.354	0.471	
<i>Model 3</i>										
X (Cognitive Empathy)	<i>a</i>	0.368	0.072	<.01	F (2, 246) = 17.15, <i>p</i> < .01	<i>c'</i>	0.34	0.076	<.01	F (3, 245) = 35.08, <i>p</i> < .01
M (Global Citizenship Identification)	–	–	–			<i>b</i>	0.467	0.064	<.01	
C (Social Desirability)		–0.13	0.069	>.05	R ² = 12.24%		0.265	0.07	<.01	R ² = 30.05%
Intercept	<i>i_M</i>	2.881	0.379	<.01			<i>i_Y</i>	–0.331	0.424	

Table 4. Linear regression analysis for mediation models 1, 2 and 3 (*n* = 249). X = Predictor, Y = Outcome, C = Control, SE = Standard Error.

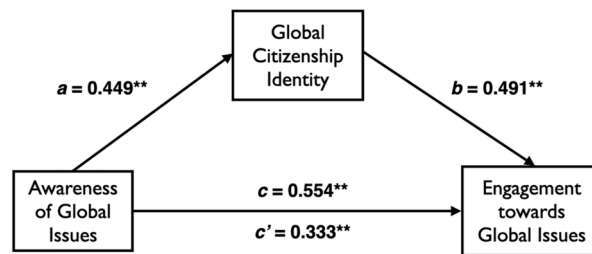


Fig. 1. Mediation analysis model with awareness of global issues as the exogenous variable, global citizenship identification as the mediator variable, and civic engagement towards global issues as the endogenous variable (Model 3). Control variable (social desirability) and CIs have been excluded in the figure for simplicity. Indirect effect = *a***b*, Direct effect = *c'*, Total effect = *c*, *n* = 249, ***p* < .01.

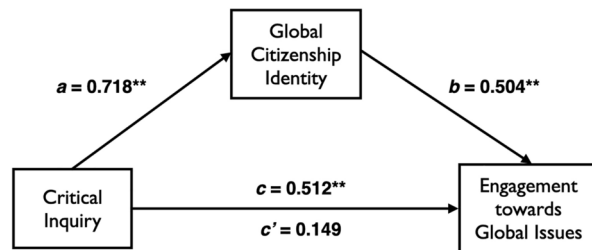


Fig. 2. Mediation analysis model with critical inquiry as the exogenous variable, global citizenship identification as the mediator variable, and civic engagement towards global issues as the endogenous variable (Model 2). Control variable (social desirability) and CIs have been excluded in the figure for simplicity. Indirect effect = *a***b*, Direct effect = *c'*, Total effect = *c*, *n* = 249, ***p* < .01.

issues was also found to be significant [ADE: *c'* = 0.340, 95% BCa CI = (0.164, 0.520), *p* < 0.01], as well as the causal mediation effect of cognitive empathy on engagement towards global issues through global citizenship identification [ACME: *ab* = 0.172, 95% BCa CI = (0.101, 0.270), *p* < 0.01]. The mediation effect accounted for 33.6% of the total effect and thus, hypothesis 3 was supported. See Fig. 3 for more details.

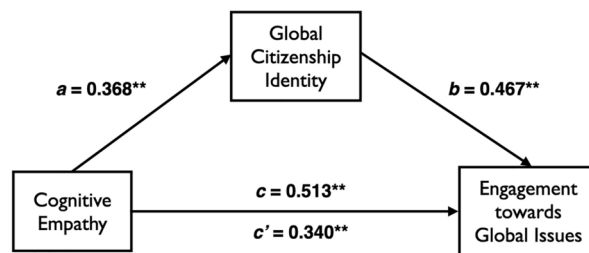


Fig. 3. Mediation model with *cognitive empathy* as the exogenous variable, *global citizenship identification* as the mediator variable, and *civic engagement towards global issues* as the endogenous variable (Model 1). Control variable (*social desirability*) and CIs have been excluded in the figure for simplicity. Indirect effect = $a*b$, Direct effect = c' , Total effect = c , $n = 249$, $**p < .01$.

Discussion and conclusion

This study investigated the roles of knowledge, skills and social identity in influencing engagement towards global issues. Specifically, we 1) examined how awareness of global issues, critical inquiry, and cognitive empathy relate to engagement towards global issues, and 2) explored whether global citizenship identification acts as a mediator in these relationships. We hypothesized that participants with high levels of awareness of global issues (H1), critical inquiry (H2), and cognitive empathy (H3) would demonstrate increased engagement toward global issues, and these effects would be mediated by global citizenship identification. Consistent with hypotheses H1 and H3, we found that higher levels of awareness of global issues and cognitive empathy significantly predicted increased engagement towards global issues directly. Indirectly, the influence of all three predictors on engagement towards global issues was significantly mediated by identification as a global citizen. In the sections below, we discuss these findings in detail.

We discuss the direct effects first. Research has shown that in the context of global challenges, individuals who educate themselves about global issues are more likely to contribute to the betterment of the world and engage in helping behaviors (such as donating and volunteering)⁸. In fact, global awareness is considered crucial to understand one's interconnectedness with the world and the impact of one's actions on a global scale⁴⁸. Recent research also suggests that increased awareness of social issues among young adults (such as through social media) can translate to engagement through offline activism⁴⁹. Our findings align with these studies, particularly revealing that participants who perceived themselves as informed and knowledgeable on global issues were more actively involved in daily activities addressing global challenges, such as reducing energy consumption at home, reading about and supporting environmental and social issue petitions, or participating in initiatives promoting gender equality (see Fig. 1). On the other hand, unexpectedly, there was no direct effect of critical inquiry observed (see Fig. 2). These findings suggest that awareness of global issues may lead to direct and immediate actions, as individuals who perceive themselves as knowledgeable about pressing global concerns may identify tangible ways in which their actions can contribute to solutions. For instance, recognizing the link between energy consumption and climate change may prompt individuals to reduce their energy usage at home. On the other hand, critical inquiry may not have the same impact alone as it involves a reflective process focused on evaluating perspectives rather than acting quickly. While awareness may prompt immediate action, critical inquiry may be important for long-term sustained engagement towards complex issues.

Cognitive empathy, also referred to as cognitive perspective-taking, involves perceiving others' perspective and emotions, recognizing them and distinguishing them from one's own experiences. Previous research has suggested that individuals with heightened cognitive empathy show greater cosmopolitan helping¹⁶. In the context of global issues, such as conflict resolution, empathy has been linked to more positive attitudes and increased readiness for reconciliation in various intergroup settings⁵⁰. For instance, in post-conflict Bosnia-Herzegovina, a study showed that the extent to which young Bosnian Serbs understood the perspective and emotions of the out-group (Bosnian Muslims), mediated the effects of shame and guilt on their willingness to make reparations to Bosnian Muslims⁵¹. Our findings expand on existing studies by demonstrating a similar trend regarding issues relevant to the entire planet. Specifically, participants with enhanced abilities to understand others' perspectives and emotions were more actively involved in daily activities addressing global challenges (see Fig. 3). These outcomes may be attributed to the role of cognitive empathy, which may prepare individuals to step outside their own cultural frameworks, adopt a global non-ethnocentric perspective, and better perceive how global issues—such as the suffering caused by climate change or social injustice—impact others' lives and ultimately, Humanity as a whole. Moreover, cognitive empathy may assist individuals in regulating their emotional responses, which can help reduce emotional overwhelm and enable more effective action to alleviate others' or collective distress. The combination of perspective-taking and emotional regulation may be a key factor in why participants with higher empathy are more actively involved in addressing global issues.

Next, we discuss the role of global citizenship identification as a mediator in the relationships between awareness of global issues, critical inquiry and cognitive empathy, and engagement towards global issues. Research indicates that endorsing the identity of a global citizen represents a promising pathway for civic engagement within and across borders, such as higher commitment and activism towards issues of human rights, social justice and climate change^{8,35,36}. Our results align with prior research as participants who identified themselves more strongly as global citizens reported to engage more frequently in activities in their daily lives

towards global challenges. Moreover, participants who scored higher on awareness of global issues (Fig. 1), critical inquiry (Fig. 2) and cognitive empathy (Fig. 3) reported to identify themselves more strongly as global citizens. These results are consistent with earlier studies that demonstrated moderate to strong correlations between all-inclusive identities and traits such as empathy, open-mindedness, and flexibility²⁵. Finally, our results point to global citizenship identification as a relevant mediator. Specifically, we observed that global citizenship identification played a substantial role (partial mediation) in explaining the impact of critical inquiry on engagement with global issues, accounting for 70.7% of this effect. Moreover, it substantially contributed to the understanding of the impact of awareness of global issues (39.9%) and cognitive empathy (33.6%) on engagement. These findings suggest that heightened awareness of global issues may enhance consciousness about individuals' global responsibilities, enhancing their global citizenship identity. This identification, in turn, may act as a catalyst for personal involvement and engagement, as individuals who perceive themselves as global citizens may experience a heightened sense of moral obligation to engage in global initiatives⁵². Similarly, even though critical inquiry leads individuals to critically evaluate and reason about information⁵³, but without a corresponding identification with global citizenship, this evaluation may not necessarily result in engagement. The substantial mediation effect observed suggests that identifying as a global citizen provides the necessary context or purpose, facilitating the translation of critical analysis into meaningful engagement. Finally, while cognitive empathy independently drives engagement, the significant mediation effect indicates that when this is coupled with strong identification as a global citizen, engagement is further amplified. This suggests that individuals who not only empathize with others but also perceive themselves as part of a global community are more likely to engage with global issues, as evidenced in similar previous research⁵⁴.

In conclusion, this study expands previous research by enhancing our understanding of how knowledge, cognitive and socio-emotional skills, and inclusive identities shape individuals' engagement with global issues. The substantial mediation effect observed highlights the crucial role of fostering a global citizenship identity in translating awareness, critical inquiry, and cognitive empathy into active engagement. By promoting understanding and connection to global issues, knowledge and skills play a key role in this process. Embracing an all-inclusive identity that encompasses a sense of belonging to a global community can significantly amplify one's sense of responsibility, purpose, and agency, driving active contributions to addressing global challenges.

While Global Citizenship Education (GCED) programs often prioritize evidence-based knowledge and cognitive skills, they frequently overlook the role of inclusive social identities. The consistent mediating role of global citizenship identification across all models underscores the significant role that social identities play in motivating action. The results highlight the potential effectiveness of identity-based interventions in fostering more engaged communities and advancing efforts toward achieving the SDGs.

Limitations and future directions

While the study used an international sample of participants, we interpret these findings with caution due to anticipated variability as a function of cultural, historical, economic, and political influences. For instance, the concept of "global citizen" may differ globally, potentially affecting participants' endorsement of global citizenship identification and its behavioral outcomes⁵⁵. Ongoing studies are examining the cross-cultural variations in the meanings and outcomes of all-inclusive identities⁵⁶. Additionally, we must acknowledge the limited evidence regarding the mediating effects of global citizenship identification, emphasizing the need for future research to replicate these relationships. Subsequent studies should also incorporate measures of political orientation and social dominance orientation in their designs, as these factors are known to correlate with measures of all-inclusive identities²⁵. Another limitation is the use of correlational data, which restricts our ability to make definitive causal inferences. Although mediation analysis can offer insights into potential pathways and relationships between variables, it cannot establish causation. The observed relationships between awareness of global issues, critical inquiry, cognitive empathy, global citizenship identification, and engagement towards global issues are associative rather than causal. Future research should aim to utilize experimental or longitudinal designs to better establish causal relationships. For instance, interventions designed to enhance cognitive empathy or critical inquiry skills could provide more robust evidence of their causal impact on global citizenship identity and engagement. Longitudinal studies could track changes in these variables over time, providing a clearer picture of how these relationships develop and evolve. By examining how shifts in cognitive empathy, critical inquiry, and awareness of global issues influence global citizenship identification and engagement over extended periods, researchers can better infer causal directions and underlying mechanisms.

Data availability

Authors agree to make the data available on request.

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Author contributions

Conceptualization: M.C., N.C.S.; Methodology: M.C.; Investigation: M.C.; Formal analysis: M.C., M.S.; Writing—original draft preparation: M.C., M.S.; Writing—review and editing: M.C., M.S., N.C.S.; Funding acquisition: N.C.S.; Supervision: N.C.S.

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Competing interests

We declare that the authors have no competing interests as defined by Nature Research, or other interests that might be perceived to influence the results and/or discussion reported in this paper.

Ethical approval

The authors complied with the APA Ethical Principles of Psychologists' Code of Conduct and the Declaration of Helsinki. All participants were 18 or older; we requested informed consent and debriefed participants following the study. Approval for the research study was obtained from the governing board of UNESCO Mahatma Gandhi Institute of Education for Peace and Sustainable Development.

Additional information

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