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DOES INSTRUCTIONAL CLARITY MODERATE THE RELATIONSHIP BETWEEN SOCIOECONOMIC STATUS AND STUDENT ACHIEVEMENT? A COMPARATIVE ANALYSIS BASED ON THE TIMSS 2023 DATA*

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ABSTRACT

Reducing the effect of social status on learning outcomes constitutes one of the crucial challenges for contemporary education systems. This study sought to determine whether instructional clarity, as a teaching quality dimension, could moderate the effect of socioeconomic status (SES) on student achievement. The analysis was based on TIMSS 2023 data collected in 29 European education systems. The study examined a simple moderation model, with instructional clarity moderating the relationship between SES and achievement in mathematics and science tests. The results showed that the strength of the SES-achievement correlation varied across education systems, mostly proving moderate. Instructional clarity showed the potential to moderate the SES-achievement relationship, although in different ways across different education systems. In the ones with less pronounced educational inequalities, greater clarity weakened the SES-achievement correlation, with students from the lowest SES backgrounds benefiting most from high instructional clarity. Conversely, in systems with more pronounced inequalities, instructional clarity proved able to even strengthen the SES-achievement correlation in the case of mathematics. The compensatory potential of high-quality instruction is shaped by the wider educational and social contexts. This has significant implications for inequality-reducing education policy measures.

Keywords:

socioeconomic status, educational inequalities, instructional clarity, student achievement, TIMSS 2023.

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INTRODUCTION

Ever since the publication of the Coleman Report (Coleman et al., 1966), debate has flourished on the way in which social background shapes educational practices. Thus far, research has revealed a moderate to strong correlation between academic achievement and socioeconomic status (SES) as an indicator of social status (Sirin, 2005). Moreover, it has been established that the economic, cultural, and social capital, as a key social status components, contribute to students' academic achievement and aspirations (Bodovski et al., 2017; Bourdieu & Passeron, 1990; Huang & Liang 2016). In numerous studies examining the correlation between social status and learning outcomes, the education system was not recognized as a significant factor shaping the relationship between these constructs (Radulović & Gundogan, 2024).

Although the Coleman Report has majorly influenced both research and education policies from as early as the 1970s, certain studies showed that school factors can significantly affect student achievement and academic aspirations (Hallinan, 2000), highlighting the importance of school organization, school resources, school climate, and teaching quality (Gamoran et al., 2000). The effects of school factors tend to be more notable among students from marginalized and underprivileged social groups who have no other learning opportunities (Entwisle et al., 2015). Likewise, research in developing countries has shown that in low-income societies with less pronounced social inequality, school factors decisively shape academic achievement, whereas family background's significance tends to be greater at higher economic development levels (Buchmann & Hannum, 2001). Increasingly, comparative studies have been conducted to determine the school environment characteristics that could moderate the effects of SES on academic achievement.

Socioeconomic Status and Student Achievement in International Research

In recent decades, research has pointed to stable and stark inequalities in student achievement in mathematics and science, which may stem from unequal access to educational content and processes, that is, unequal learning opportunities. A study based on the TIMSS 2011 and PISA 2012 data for Russia found that students from lower SES backgrounds also had lower mathematics achievement, indicating a need for them to receive additional assistance in mathematics classes to help them improve their mathematical problem-solving abilities and competencies (Kang & Cogan, 2022). When schools and education systems do not provide differential learning opportunities, social inequalities in learning outcomes are perpetuated and exacerbated. It has been shown that student SES not only correlates with achievement in mathematics and science but also indirectly affects learning outcomes via unequal learning opportunities. Certainly, correlation strength hinges on various contextual variables. For instance, Gustafsson et al. (2018) analyzed the relation between SES and mathematics achievement and showed that, depending on the school environment and the wider social context, education systems can contribute to both increasing and diminishing social inequalities.

Relying on the PISA 2012 data for 33 OECD member countries, Schmidt et al. (2015) examined interactions between learning opportunities, SES, and mathematics achievement to establish whether and to what extent social inequalities were reproduced by education systems. The analysis showed that the correlation between student SES and achievement on the test was partially mediated by structural differences and school learning conditions. This mechanism can be described as the institutional reproduction of socioeconomic inequality. Namely, students from privileged backgrounds attend schools that offer greater and more diverse learning opportunities. In conjunction with pre-existing advantages, this further widens the achievement gap in relation to children from lower SES backgrounds (Yang Hansen & Strietholt, 2018). Yang et al. (2018) also found a positive correlation between student SES and mathematics achievement after controlling for mathematics self-concept (self-confidence in learning mathematics), further noting that greater learning opportunities affected achievement. In their study, there was a significant positive indirect effect of family background on achievement on the mathematics test, mediated by differential learning opportunities, which indicates that schools do not bridge but rather increase the student achievement gap (Yang Hansen & Strietholt, 2018).

Hence, comparative research has shown that in some countries, education has a strong compensatory effect, with the approach to education and teaching quality significantly diminishing the impact of family background on student achievement. Conversely, there are countries in which the education system can perpetuate or even increase inequalities, resulting in an even greater influence of home SES on students' academic success. For instance, research has shown that students\ perceived teacher support can moderate the relationship between cultural capital and reading comprehension test results (Radulović et al., 2022). It has been established that the nature of this moderation varies across education systems, with authors noting that in education systems with the highest educational inequality levels, unequal perceived support reinforces inequality, whereas in education systems with the lowest educational inequality levels, greater perceived support diminishes the effect of cultural capital on achievement (Ibid.). Thus, education systems can be purposefully organized to ensure that education quality at least partially reduces the effects of unfavorable family and social factors. In turn, the structure and organization of education systems can contribute to social justice. Considering all of the above, it is crucial to assess the contribution of teaching quality on the moderation of the correlation between SES and academic achievement, as teaching quality can constitute a key mechanism for overcoming social and educational disparities. This study focused on examining the contributions of instructional clarity as one of the key dimensions of teaching process quality (Nilsen et al., 2016; Teig & Nilsen, 2022) and a factor that can shape differences in students' levels of content understanding, engagement, and academic achievement.

Instructional Clarity as a Teaching Quality Dimension

Instructional clarity pertains to the teacher's effectiveness in applying different pedagogical techniques to support students' learning process (Asp et al., 2026) and providing instruction that allows students to understand the learning content (Metcalf, 1992). Hence, instructional clarity refers to how clearly and explicitly the teacher communicates what needs to be learned, which activities need to be implemented, and how students should approach them (Maulana et al., 2016). At the same time, instructional clarity is reflected in how easily students can understand their learning goals (Neumann et al., 2012). Teachers who instruct clearly employ different methods of emphasizing the key concepts that students need to master (e.g., they write them down or repeat them) and check understanding by asking clear questions and organizing activities that require students to apply the acquired knowledge (Metcalf, 1992; Neumann et al., 2012). When the teacher clearly formulates the expectations, provides straightforward instructions, and makes the content easy to understand, students are encouraged to engage in the learning process, to learn by interacting with others, gain a deeper understanding of the content, and more easily apply the acquired knowledge in practical, real-life situations (as cited in Pečiuliauskienė, 2023; Teig, 2023).

Studies have shown that there is a correlation between instructional clarity and student achievement. For instance, a secondary analysis of the TIMSS 2019 data on a sample of Australian eighth-graders (Zhang et al., 2025) showed that, controlling for students' demographic characteristics, SES, and parents' education level, there was a positive correlation between instructional clarity and mathematics achievement. Conversely, the analysis revealed no statistically significant correlation between instructional clarity and science achievement. At the same time, the findings showed that instructional clarity better predicted students' motivation to learn science compared to mathematics. Another analysis based on the same data (TIMSS 2019) found that, in the context of Australian eighth-graders, classroom disorder shaped the relationship between instructional clarity and mathematics achievement (Berger et al., 2023).

In a study based on the TIMSS 2019 data for students from England and Hong Kong (Chen & Lu, 2022), instructional clarity significantly and positively affected academic emotions and student achievement in both education systems. However, the direct effect of instructional clarity on mathematics achievement was negative and statistically significant in England and statistically non-significant in Hong Kong. A study based on the TIMSS 2019 data for Hong Kong students showed that in the case of science, instructional clarity directly negatively affected student achievement in the cognitive domains of recognition and application, whereas its effect in the domain of reasoning was statistically non-significant (Cheung & Sonkqayi, 2025). An analysis on the same TIMSS 2019 dataset for Swedish fourth-graders revealed that at the student level, instructional clarity shared no statistically significant correlation with mathematics achievement when controlling for variables such as SES, student gender, and the language spoken at home (Asp et al., 2026). In a study that relied on the TIMSS 2019 data for five Asian and five European countries, instructional clarity diminished the effects of unfavorable classroom conditions on mathematics self-concept (Gao & Lv, 2024). Finally, based on the TIMSS 2015 data for Turkish fourth-graders, Ersan and Rodriguez (2020) established the existence of significant positive school-level correlations between mathematics test scores, teaching quality, and school readiness, after controlling for SES.

Undoubtedly, instructional clarity constitutes one of the key teaching quality dimensions, considering that research has also found it to directly increase student interest in mathematics (Gao et al., 2025), contribute to students' positive attitude towards mathematics (Chen, 2023), and statistically significantly affect student motivation for learning physics (Pečiuliauskienė, 2023). Likewise, studies have shown that in the domain of science, teaching practices that emphasize the aspect of instructional clarity positively affect student achievement (Teig & Nilsen, 2022).

Considering that numerous studies have pointed to a correlation between student social standing factors (e.g., social class position, SES, and cultural capital) and academic achievement, this research aimed to determine whether instructional clarity, as a teaching quality dimension (as cited in Teig, 2023), can help diminish inequalities in various education systems. Having in mind the findings related to Serbia showing that instructional clarity can somewhat moderate the relationship between the abovementioned variables, that is, that in the context of instruction that is perceived as clear, social inequalities can become somewhat less pronounced (Radulović et al., 2025), this study sought to establish whether a similar relation pattern can be observed in other social contexts.

METHOD

Sample. To address the research question, the study relied on publicly available data collected within TIMSS 2023 survey. In order to ensure comparability, the analysis was based exclusively on data for European countries and territories (29 countries and territories, N=140,321). Data for England and the Netherlands were excluded from the analysis as they did not encompass data collected from parents, which were necessary to assess students' SES. Provided in supplements (Table S1) is the list of countries and territories, complete with corresponding sample sizes.

Instruments. Student scores on the TIMSS 2023 mathematics and science tests served as the indicator of achievement. Further employed in the analysis were the scales of Home Socioeconomic Status, Instructional Clarity in Mathematics Lessons, and Instructional Clarity in Science Lessons. The Home Socioeconomic Status scale was constructed based on the highest education level attained by either parent, parents' occupational level, home library size, and the number of children's books in the household. The scales used to measure students' perceptions of instructional clarity in mathematics and science lessons comprised seven items for each subject. Students used a four-point Likert-type scale to express their agreement with claims such as: *My teacher is easy to understand; My teacher does a variety of things to help* *us learn; My teacher gives me helpful feedback on my work* (for more information on the scales used, see von Davier et al., 2024).

Procedure. To examine the way instructional clarity moderated the SES-achievement relationship in countries and territories with different educational inequality levels, the countries and territories were first ranked based on the strength of the SES-achievement correlation. Further analyses focused on two groups of countries and territories, with the first comprising the three countries and territories with the weakest correlation, and the second consisting of the three countries and territories with the strongest SES-achievement correlation. To maximize comparability, these two groups only included countries and territories in which student test scores were within the range of 475-550 points, which corresponded to the average knowledge level.[1] Based on the defined criteria, it was established that the first group (the weakest SES-achievement correlation) included Albania, Portugal, and Latvia in science, and Montenegro, Albania, and Italy in mathematics. The countries of Hungary, Bulgaria, and Slovakia made up the second group, characterized by the strongest relationship between SES and achievement in both subjects.

In the subsequent step, for both groups of countries and both subjects (mathematics and science), a simple moderation model was analyzed with SES as the independent variable, instructional clarity in mathematics or science lessons as the moderator, and achievement on the corresponding knowledge test as the dependent variable (Figure 1). The analysis was conducted using the *IBM SPSS 26* software and the *PROCESS Macro* v. 4.2 extension.

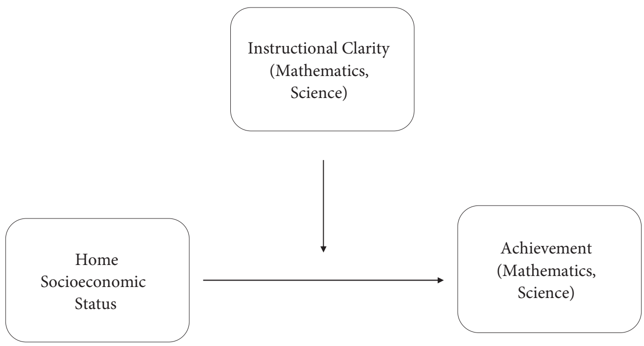

FIGURE 1. The analyzed model

1 In most European countries and territories, knowledge levels were around average. This was the case with 23 out of 29 countries and territories in terms of the science test and 24 out of 29 in the case of mathematics.

RESULTS

In the 29 European countries and territories that participated in the research and administered all the necessary instruments, there was a moderate SES-achievement correlation ($r_{science}$=.468, $r_{mathematics}$=.426). Yet, between-country differences were considerable, with SES-achievement correlation strength ranging from weak in some countries (e.g., Albania $r_{science}$=.285) to borderline strong or strong in others (e.g., Slovakia $r_{science}$=.619). A table of correlations by subject for all countries and territories is provided in supplement (Table S2). Having in mind these significant differences and seeking to examine the way instructional clarity moderated the SES-achievement relationship in education systems characterized by different equity levels, further analyses exclusively focused on the two formed groups of countries.

Science. Due to the way the two groups were defined, there were major differences in SES's impact on science achievement. Namely, SES explained 34.4% of the variance in achievement in the group of countries with the strongest SES-achievement correlation and 16.7% of the variance in achievement in the group of countries with the weakest SES-achievement correlation. On the other hand, the relationship between instructional clarity and science achievement was similar in both groups of countries, being negligibly weak in countries with the strongest SES-achievement correlation and statistically non-significant in countries with the weakest SES-achievement relationship (Table 1).

TABLE 1. Correlations between students' science achievement, home socioeconomic status, and instructional clarity (for the two groups of countries)

	Group of Countries with the Strongest Correlation Between SES and Science Achievement			**Group of Countries with the Weakest Correlation Between SES and Science Achievement**		
	Science Achievement	**SES**	**Instructional Clarity in Science Lessons**	**Science Achievement**	**SES**	**Instructional Clarity in Science Lessons**
Science Achievement	1	.587**	.017*	1	.409**	-.002^{NS}
SES	.587**	1	-.075**	.409**	1	-.082**
Instructional Clarity in Science Lessons	.017*	.075**	1	-.002NS	-.082**	1

Note. ***p*<.01; **p*<.005; NS – statistically non-significant

A hierarchical multiple regression analysis was conducted to determine whether perceived instructional clarity moderated the relationship between SES and science achievement among students from the group of countries with the strongest correlation. In the first step, the variables of SES and instructional clarity were introduced into the model. These variables explained a significant portion of the variance in science achievement (R^2=.339, F(2, 11565) =2971.51, p<.001). In the subsequent step, the variable of interaction between SES and instructional clarity was introduced into the regression model, but it did not statistically significantly contribute to the explanation of the variance in achievement (ΔR^2 =.0001, ΔF(1, 11564)=3.754, p=.052). Thus, it was concluded that instructional clarity did not significantly moderate the relationship between SES and science achievement.

The results obtained among students who attended schools within the education systems with the weakest correlation between SES and science achievement differed from the findings presented in the previous paragraph. To discover whether instructional clarity had a moderator role in this case, another hierarchical multiple regression analysis was conducted. In the first step, the variables of SES and instructional clarity were introduced into the model, and they explained approximately one-sixth of the variance in science achievement (R^2=.165, F(2, 8480)=838.7651, p<.001). In the following step, the interaction variable was introduced into the regression model, and it made a small but statistically significant contribution to the explanation of the variance in achievement (ΔR^2=.0026, ΔF(1, 8479)=26.1, <.001).

The graphical representation of the interaction shows that instructional clarity diminished the strength of the SES-achievement correlation. Despite SES having a statistically significant positive effect on achievement at all instructional clarity levels (low – 16th percentile, medium – 50th percentile, and high – 84th percentile), it is clear that at higher instructional clarity levels, the effect of SES on science achievement was weaker (Supplement – Table S3). As shown in Figure 2, students from high SES backgrounds showed similar achievement regardless of the instructional clarity level, whereas students from low SES backgrounds who attended lessons with the highest instructional clarity levels also had the highest science achievement. Hence, instructional clarity moderated the SES-achievement relationship and proved most significant for the least privileged students.

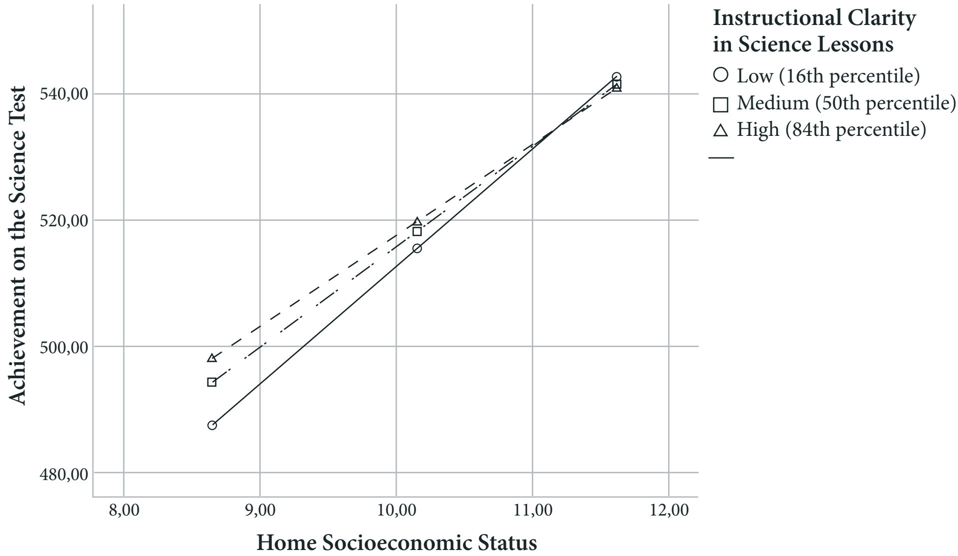

FIGURE 2. Home socioeconomic status, instructional clarity, and science achievement (The group of countries with the weakest correlation between SES and achievement)

Mathematics. When formed groups of countries were observed, it was noticeable that SES explained less variance in mathematics achievement compared to science (less than 30% of the variance in achievement in the group of countries with the strongest SES-achievement correlation and a mere 7% of the variance in achievement in the group of countries with the weakest SES-achievement correlation). On the other hand, the relation between instructional clarity and achievement was somewhat stronger than in the case of science, although it could still be categorized as weak (Table 2).

TABLE 2. Correlations between students' mathematics achievement, home socioeconomic status, and instructional clarity (for the two groups of countries)

	Group of Countries with the Strongest Correlation Between SES and Mathematics Achievement			Group of Countries with the Weakest Correlation Between SES and Mathematics Achievement		
	Mathematics Achievement	SES	Instructional Clarity in Mathematics Lessons	Mathematics Achievement	SES	Instructional Clarity in Mathematics Lessons
Mathematics Achievement	1	.539**	.043**	1	.265**	.168**
SES	.539**	1	-.078**	.265**	1	-.001^{NS}
Instructional Clarity in Mathematics Lessons	.043**	.078**	1	.168**	-.001^{NS}	1

Note. ***p*<.01; NS – statistically non-significant

To examine whether perceived instructional clarity moderated the relationship between SES and mathematics achievement in the group of countries with the strongest SES-achievement correlation, another hierarchical multiple regression analysis was conducted. In the initial step, the model in which SES and instructional clarity were the only predictor variables explained about 28% of the variance in achievement (R^2=.286, F(2, 11690)=2342.427, p<.001). The introduction of the interaction variable that constituted the product of SES and instructional clarity led to a small but statistically significant increase in the variance explained (ΔR^2=.0006, ΔF(1, 11689)=9.945, p<.01). Hence, unlike in the case of science achievement in the group of countries with the strongest SES-achievement correlation, in the context of mathematics, instructional clarity did have a moderator role.

Yet, analyzing the graphical representation of the interaction, it would seem that in this case, greater instructional clarity did not diminish the strength of the SES-achievement correlation. Namely, at higher instructional clarity levels, SES had a greater effect on mathematics achievement (Supplement – Table S4). As shown in Figure 3, the achievement of students from low SES backgrounds remained relatively stable across different instructional clarity levels, whereas high-SES students' achievement varied more significantly, with the highest test scores obtained at the highest perceived instructional clarity level. Thus, in this case, the most socially privileged students benefited most from instructional clarity.

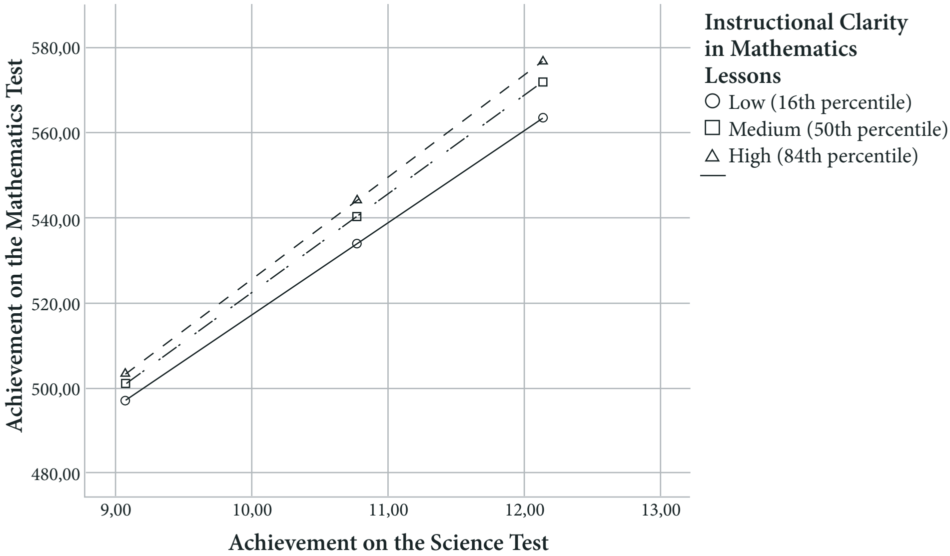

FIGURE 3. Home socioeconomic status,
Instructional clarity and mathematics achievement
(The group of Countries with the strongest correlation between SES and achievement)

The findings pertaining to students from education systems with the weakest correlation between SES and mathematics achievement significantly differed from the results presented in previous paragraphs, proving more similar to the results presented in the section devoted to science. As expected, in this case, SES and instructional clarity in mathematics lessons explained less than 10% of the variance in achievement (R^2=.092, F(2, 8461)=429.945, p<.001). The introduction of the interaction component into the model led to a statistically significant increase in the explained variance in achievement (ΔR^2=.0031, ΔF(1, 8460)=29.013, p<.001). Similar to findings regarding science, higher instructional clarity moderated the strength of the SES-achievement correlation, with the effect of SES on mathematics achievement diminished at higher instructional clarity levels (Supplement – Table S5). As shown in Figure 4, although students from all socioeconomic backgrounds showed the highest achievement when they perceived instruction as clear, differences in achievement resulting from different instruction clarity levels were most pronounced among students from the lowest SES backgrounds. Hence, instructional clarity proved to moderate the SES-achievement relationship and be particularly important for the most socially underprivileged students.

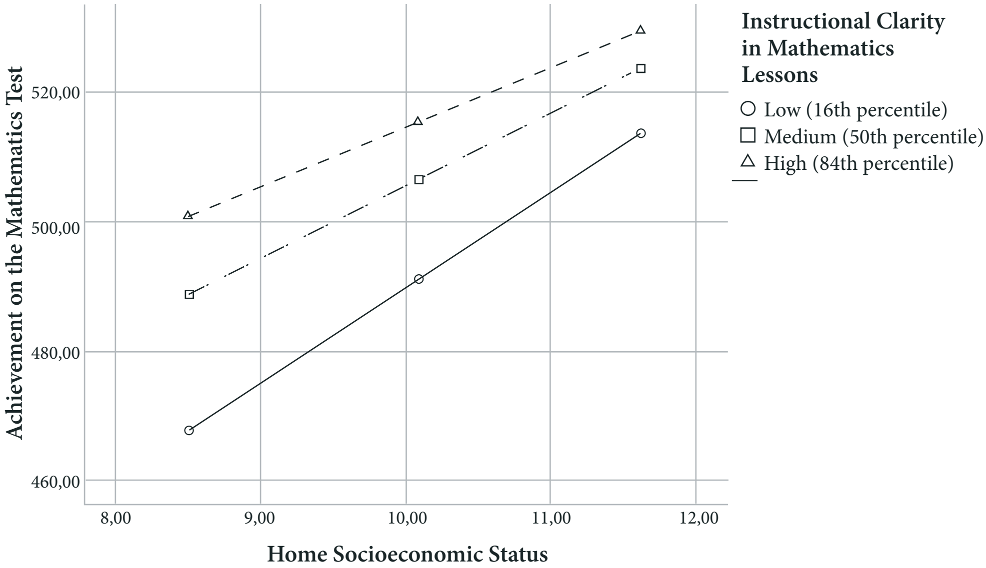

FIGURE 4. Home socioeconomic status,
instructional clarity, and mathematics achievement
(the group of countries with the weakest correlation between ses and achievement)

DISCUSSION

This study aimed to determine whether instructional clarity can moderate the relationship between SES and student achievement in mathematics and science. Crucially, the findings revealed a significant correlation between SES and achievement in mathematics and science and showed that correlation strength was moderate in most education systems. This finding is in line with the results of international research pointing to the persistence and sometimes even intensification of disparities in academic achievement among students from different SES backgrounds (Yang Hansen & Strietholt, 2018).

The present research yielded two key findings. First, instructional clarity can significantly moderate the SES-achievement relationship, and it can contribute to the weakening of this correlation. Second, instructional clarity moderates the aforementioned relationship in different ways across societies and subjects, i.e., mathematics and science. On the one hand, the results showed that instructional clarity significantly moderated the SES-achievement relationship in both mathematics and science in the group of countries with the weakest correlation between SES and achievement (Albania, Portugal, Latvia, Montenegro, and Italy). This means that the effect of SES on student achievement was reduced in the context of greater instructional clarity. In other words, in the aforementioned countries, instructional clarity further diminished the effect of students' social background on their learning outcomes, with the most underprivileged students benefiting most from clear instruction. The same holds true for Serbia (Radulović et al., 2025), despite it not being one of the countries with either the strongest or the weakest relation between the investigated variables. Likewise, these findings align with research results suggesting that different aspects of teaching quality can help reduce educational inequalities (Gundogan et al., 2020; Kamii et al., 2005; Radulović et al., 2022).

On the other hand, in the group of countries with the highest educational inequality levels (Hungary, Bulgaria, and Slovakia), instructional clarity did not diminish the effect of SES on achievement in mathematics and science. In fact, in the case of mathematics, instructional clarity increased the effect of SES on achievement. In other words, privileged students benefited most from high instructional clarity. Although this finding may be surprising, it aligns with the results of other research in countries with profound social and educational inequalities (Radulović et al., 2022). Likewise, some studies have suggested that students from middle and upper social classes benefit more from certain aspects of teaching quality, such as teacher support (Calarco, 2011). This is certainly in line with Bourdieu's view of education as an element of social reproduction biased in favor of more privileged students (i.e., students possessing higher cultural capital), which explains why they most greatly benefit from high-quality education (Bourdieu & Passeron, 1990). Overall, it is reasonable to assume that teaching practices and their meanings are context-dependent, making it possible for the same practice to have opposing effects in different education systems. Likewise, the understanding of instructional clarity can vary across education systems. For instance, building on Bourdieu's ideas, it is possible that in societies with pronounced inequalities, underprivileged students may believe that instruction is clear, but that it is not intended for them (Bourdieu & Passeron, 1990: 157), that it does not speak to them or that they cannot benefit from instructional clarity.

The aforementioned assumption leads us to one of the major limitations of this study. Namely, the scale used to measure instructional clarity exclusively relied on student perceptions. Considering that perceptions can be shaped by diverse factors, cultural or otherwise, the same scores on the scale may be differently interpreted across different societies. Primarily, students' social status can affect their perception of instructional clarity or its relevance to teaching practices. Furthermore, the meaning of instructional clarity and its significance for students' learning process can differ across education systems, for instance, depending on whether they are predominantly characterized by transmissive teaching or engaging instruction (Chen & Lu, 2022). Finally, students who filled out the questionnaires had experience working with different numbers of teachers, with some working with only one teacher, others working with one class teacher and several subject teachers, and certain students working with multiple subject teachers since the first grade. These diverse experiences could have resulted in differences in students' ability to evaluate various aspects of instruction. It can be assumed that students who exclusively worked with one teacher not only formed a closer relationship with their teacher, which could have shaped their responses, but also had a limited ability to objectively evaluate instructional clarity, as they were unable to conduct a between-teacher comparison. Hence, having in mind that the study was based on student perceptions, future research could gain a more comprehensive insight by including teacher perceptions or employing additional research methods such as systematic classroom observation.

Another limitation of this study lies in the fact that it only examined one dimension of teaching quality. For instance, the analysis did not encompass classroom management, a TIMSS 2023 variable that previous research has shown to share a significant correlation with student achievement (Chen & Lu, 2022; Yagan, 2021). Hence, future studies should include classroom management in their models to better understand the specific contributions of different teaching quality aspects to moderating the relationship between SES and student achievement.

CONCLUSION AND IMPLICATIONS

Previous research has shown that instructional clarity can contribute to students' positive attitude towards and interest in learning, significantly impacting student motivation (Chen, 2023; Gao et al., 2025; Pečiuliauskienė, 2023). Our comparative study showed that instructional clarity constitutes a teaching quality dimension that can moderate the SES-achievement relationship. It further highlighted the significance of wider social and educational contexts that shape the moderator role of instructional clarity. In societies with the lowest educational inequality levels, instructional clarity further diminished disparities, whereas in societies with the highest educational inequality levels, this dimension did not have a moderating effect or even exacerbated inequalities. The present research is particularly valuable because it was based on a large sample of students from diverse but comparable societies. Likewise, this study sheds light on the manners in which instruction quality can interact with social inequalities, which is a matter that has seldom been explored in existing research.

The obtained results have clear implications for educational actors at different levels. First and foremost, education policymakers should help raise underprivileged families' awareness of the importance of education through diverse support programs. For such measures to be effective, education needs to be relevant to children with low social status, which is a prerequisite to instructional clarity and other teaching quality dimensions having a significant impact on their learning outcomes. Inter alia, this implies that education should be completely open to all social groups and an unquestionably significant channel of social mobility.

Furthermore, initial teacher education and professional development should aim to raise teachers' awareness of how quality instruction contributes to minimizing social inequalities. On the one hand, this means that they should receive the didactic-methodical knowledge and skills necessary for high-quality instruction. On the other hand, it is necessary to familiarize teachers with the significance of adapting instruction to students from different social backgrounds, making classes equally relevant to all students. In other words, teachers should continuously reflect on their own practices and work on adapting and improving them in order to enhance different teaching quality dimensions that can help reduce the effects of social inequalities on student achievement.

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SUPPLEMENTS

TABLE S1. Analyzed countries and territories

Country	N	Country	N
Albania	2,374	Bosnia and Herzegovina	3,391
Bulgaria	4,103	Cyprus	4,829
Czech Republic	6,822	Denmark	5,166
Finland	5,803	France	4,739
Germany	4,442	Hungary	5,241
Ireland	4,750	Italy	4,453
Kosovo	4,609	Latvia	4,299
Lithuania	4,520	Montenegro	4,417
Norway	5,301	Poland	4,666
Portugal	5,214	Romania	3,559
Serbia	4,349	Slovakia	4,788
Slovenia	4,746	Spain	10,216
Sweden	5,139	Turkey	4,541
North Macedonia	4,633	Belgium (the Flemish Community)	4,336
Belgium (the French Community)	4,875	Total	140,321

TABLE S2. The relationship between home socioeconomic status and achievement on tests across countries and territories

Country	r SES–SCI	SCI	r SES–MAT	MAT	Country	r SES–SCI	SCI	r SES–MAT	MAT
Albania	.285	491	.294	512	Montenegro	.329	461	.268	477
Portugal	.382	511	.378	517	Latvia	.39	526	.352	534
Kosovo	.4	403	.405	451	Italy	.41	511	.315	513
Lithuania	.411	537	.384	561	Bosnia and Herzegovina	.413	448	.412	447
Romania	.416	526	.418	542	Czech Republic	.427	526	.383	530
Poland	.428	550	.378	546	Ireland	.431	532	.415	546
Finland	.438	542	.369	529	Serbia	.444	510	.457	523
Turkey	.444	570	.466	553	Norway	.445	530	.347	531
Spain	.447	504	.421	498	Denmark	.452	522	.364	524
Belgium (the Flemish Community)	.458	488	.373	521	North Macedonia	.459	439	.406	474

Country	r SES–SCI	SCI	r SES–MAT	MAT	Country	r SES–SCI	SCI	r SES–MAT	MAT
Cyprus	.459	487	.39	516	Slovenia	.477	526	.384	514
Sweden	.498	533	.408	530	Belgium (the French Community)	.505	481	.44	489
France	.512	488	.474	484	Germany	.519	515	.458	524
Hungary	.551	524	.521	520	Bulgaria	.587	530	.54	530
Slovakia	.619	521	.552	515					

Note. r SES–SCI denotes the coefficient of the relationship between SES and science achievement (SCI), whereas r CEC–MAT denotes the coefficient of the correlation between SES and achievement in mathematics (MAT). SCI and MAT represent the average student scores on the TIMSS science and mathematics tests.

TABLE S3. The group of countries with the weakest correlation between socioeconomic status and science achievement

Model Summary						
R	R-sq	MSE	F	df1	df2	p
.4095	.1677	4124.8491	569.5300	3	8479.0000	.0000
The Main Model						
	coeff	Se	t	p	LLCI	ULCI
Constant	226.7862	23.6069	9.6068	.0000	180.5109	273.0615
SES	27.5378	2.2548	12.2128	.0000	23.1177	31.9578
Instructional Clarity in Science Lessons	12.3710	2.2625	5.4678	.0000	7.9360	16.8061
Interaction	-1.1086	.2170	-5.1088	.0000	-1.5340	-.6832
Predictor Effects at Different Moderator Values						
Instructional Clarity in Science Lessons	Effect	Se	t	p	LLCI	ULCI
Low	18.5294	.6038	30.6903	.0000	17.3459	19.7129
Medium	15.8179	.4018	39.3655	.0000	15.0302	16.6056
High	14.3498	.5354	26.8036	.0000	13.3003	15.3992

TABLE S4. The group of countries with the strongest correlation between socioeconomic status and mathematics achievement

Model Summary						
R	R-sq	MSE	F	df1	df2	p
.5355	.2867	4702.0840	1566.1279	3	11689.0000	.0000
The Main Model						
	coeff	Se	t	p	LLCI	ULCI
Constant	329.8160	20.2723	16.2693	.0000	290.0790	369.5531
SES	17.1169	1.8699	9.1536	.0000	13.4513	20.7821
Instructional Clarity in Mathematics Lessons	-3.5692	1.9183	-1.8606	0.0628	-7.3294	0.191
Interaction	0.5603	0.1777	3.1535	0.0016	0.212	0.9085
Predictor Effects at Different Moderator Values						
Instructional Clarity in Mathematics Lessons	Effect	Se	t	p	LLCI	ULCI
Low	21.5889	0.5384	40.1018	0	20.5336	22.6441
Medium	23.0427	0.3371	68.3524	0	22.3819	23.7035
High	23.8769	0.4522	52.8017	0	22.9905	24.7633

TABLE S5. The group of countries with the weakest correlation between socioeconomic status and mathematics achievement

Model Summary						
R	R-sq	MSE	F	df1	df2	p
.3088	.0954	5110.8302	297.2502	3	8460.0000	.0000
The Main Model						
	coeff	se	t	p	LLCI	ULCI
Constant	187.6937	26.0937	7.1931	0	136.5436	238.8438
SES	25.389	2.5928	9.7923	0	20.3066	30.4715
Instructional Clarity in Mathematics Lessons	19.4699	2.5062	7.7686	0	14.557	24.3827
Interaction	-1.3416	0.2491	-5.3864	0	-1.8298	-0.8534
Predictor Effects at Different Moderator Values						
Instructional Clarity in Mathematics Lessons	Effect	se	t	P	LLCI	ULCI
Low	14.6747	0.7266	20.1972	0	13.2504	16.0989
Medium	11.1993	0.4673	23.9662	0	10.2833	12.1153
High	9.2018	0.6459	14.2454	0	7.9356	10.468