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ORIGINAL PAPER

Incidence of Factors in Teaching Actions to Manage Antisocial Cyberbehaviour

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Abstract
With the proliferation of information and communication technologies (ICT), antisocial cyber-behavior has emerged, where teachers have a crucial role in the prevention and management of this behavior, focusing on developing actions that promote emotional and civic competences in students, where the skills and beliefs of the teacher are also a key piece. The purpose of this study was to develop an instrument to analyze the impact of these factors on teachers' actions to manage students' antisocial cyber-behaviors. A higher-order causal model was proposed following the partial least squares (PLS) method. The study was conducted with a sample of 835 active teachers from different educational stages from Spain, who taught in the following educational stages: Early Childhood Education, Primary Education, Secondary Education, Adult Education and Vocational Training. The main finding indicates that teachers' beliefs, coupled with their conflict resolution skills and approaches to fostering civic competencies, significantly influence (accounting for 50.30% of the real variance) their actions in managing cyber social behaviors. The study further reveals a connection between teachers' actions to enhance emotional and citizenship skills in students and their proficiency in conflict resolution. Consequently, the study underscores the importance of teachers possessing effective conflict resolution skills. These findings hold practical implications for education, as the developed causal model provides a deeper understanding of the factors influencing teachers' actions, facilitating targeted interventions in specific areas.

Keywords Cyberhate · Cyberbehaviour · Socio-emotional and moral skills · Teacher training · Beliefs · Skills · Cultural and social implications

Introduction

The inappropriate utilization of Information and Communication Technologies (ICT) holds the potential to escalate into cyber antisocial behavior (Wordu et al., 2021). The anonymity afforded by the Internet, coupled with the widespread use of smartphones, gives rise to novel arenas for social interaction. Within these spaces, there is a concerning prevalence of harmful cyber antisocial behavior in compulsory education students (González Sodis & Leiva, 2022).

This behavior is characterized as both inappropriate and criminal, encompassing actions that can "inflict harm or property loss or damage on others and are intended to lower the well-being of other persons" (Aleksandra, 2018, p. 33). The significance of scrutinizing adolescent cyber antisocial behavior has prompted numerous research endeavors. Notably, Garaigordobil (2017) delved into the prevalence of antisocial behavior among more than 3000 adolescents aged between 12 and 18, revealing a substantial correlation between elevated scores in antisocial behavior and heightened involvement in cyberbullying situations. Similar results were also found by Tirado (2022) and Rodríguez-Álvarez et al. (2018). Furthermore, these aggressive behaviors are interconnected with other behaviors that are detrimental to students' well-being (compulsory secondary education), such as the cultivation of poor social skills (Martínez et al., 2020) and subpar academic

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performance (Sinthumule & Ngonyama, 2022). Consequently, prioritizing the study of these behaviors becomes imperative within the responsibilities and functions of the educational community, aiming to proactively prevent and alleviate these tendencies.

To counteract this trend, both educators and educational institutions bear significant responsibilities in addressing antisocial cyber behavior (Calderón, 2020; Mayer, 1995). Early childhood educators, in particular, are tasked with imparting knowledge to students about the secure and responsible utilization of technology (Lauricella et al., 2020). Additionally, teachers who teach in compulsory educational stages must remain vigilant to identify and thwart such behaviours (Gaeta et al., 2020) and should be adept at discerning when and how to report any harmful conduct to school authorities (González & Santos, 2021). This necessitates that teachers possess the personal skills required to navigate challenging behavior and issues related to antisocial conduct (Siddiqui et al., 2023). However, some studies underscore the insufficient preparation of preservice teachers enrolled in a teacher education program in dealing with these challenges (Li, 2009). On the institutional front, schools should establish well-defined policies concerning technology usage and the prevention of antisocial cyber behavior (Donat et al., 2023).

A pivotal strategy in curbing antisocial cyber behaviour among adolescents involves the implementation of didactic approaches aimed at fortifying socioemotional and moral competences (Llorent et al., 2023). In this regard, Campos et al.'s work (2022) illuminated how deficient levels of socioemotional competences, particularly empathy, correlated with heightened tendencies toward aggressive and antisocial behavior. Consequently, fostering moral actions and implementing strategies to cultivate empathy among secondary school students could not only enhance social interactions among peers (Caurín et al., 2019) but also serve to diminish instances of aggressive cyber behaviors among adolescents (Trivedi & Crook, 2022).

The cultivation of citizenship competences has been underscored as pivotal in fostering respectful coexistence among primary school students (De Schaepmeester et al., 2022). Also, Sincer et al. (2022) highlight that secondary school students grapple with a “social task when controversial issues are discussed in the classroom, when they encounter a person in need of help, or when they must resolve a conflict with a stranger” (p. 127). Consequently, it becomes imperative to address concepts such as diversity, pluralism, and social injustice within the classroom (Byker, 2016). Actively instilling these competences in students of compulsory educational stages, along with nurturing skills for engaging in dialogue, peacefully resolving problems, and learning to both respect and be respected in the presence of others (Muhonen et al., 2022; Saputra et al., 2020), holds the potential to significantly contribute to the reduction of antisocial behavior among students (Bear, 2020).

Within this context, the training of teachers' skills (Siddiqui et al., 2023), coupled with their beliefs in behavioral problem management (Arbeau & Coplan, 2007), and instruction in socioemotional and citizenship skills (Marín & Zych, 2024), holds the potential to elevate the actions they undertake to prevent or diminish antisocial cyber behavior among students. Remarkably, there is a dearth of studies from the teacher's perspective specifically delving into the impact of these factors on the actions teachers themselves employ to manage such antisocial ciber-behaviors.

That is, what are the most incident and significant factors in the actions that the teacher carries out to manage these antisocial ciber behaviors? Hence, the research endeavors to develop a causal instrument to scrutinize the influence of teachers' skills and beliefs on the management of students' antisocial cyberbehavior, along with assessing the repercussions of implementing actions by teachers in service to enhance emotional and civic competences in their students. The authors have formulated the ensuing causal model grounded in various theories and statements:

- The factor 'teacher beliefs about cyber social behaviors (DIM.1) is conceptualized as “a psychological tendency expressed by evaluating a particular entity with some degree of favor or disfavor” (Gilbert et al., 1998, p. 269). In the words of Henerson et al. (1987) a person's attitudes or beliefs "can only be deduced from their words and actions" (p. 11). In our context, these beliefs are intertwined with teachers' judgments and values concerning their own responsibility (DIM.2), as well as the judgments and values teachers hold about actions within their educational centre to manage antisocial cyber behavior in students (DIM.3). Scholars such as Mansour (2013) and Muliyah and Aminatun (2020) underscore that teachers' beliefs wield influence over their perspectives and actions in teaching practices. Consequently, the research aims to construct a causal instrument analyzing the impact of teachers' skills and beliefs on the management of students' antisocial cyber behavior, alongside the consequences of implementing actions to enhance emotional and civic competences in their students. The proposed causal model is derived from various theories and statements. While Santos and Miguel (2019) assert that “teachers' beliefs could be a factor influencing classroom practices' (p. 13), and 'these beliefs may impact their actions” (Beck et al., 2000, p. 324), in our case, these actions pertain to the teacher's engagement with students to manage their antisocial cyber behaviors (DIM.4). For instance, Charlesworth et al. (1991) scrutinized the correlation between kindergarten teachers' beliefs and their practices, discovering a positive con-

nection between beliefs and actions in the classroom. However, these results, some of which are outdated, do not specifically focus on teachers' beliefs and the management of students' antisocial cyber behaviours, making it imperative to investigate these relationships explicitly.

- The factor teaching skills for conflict resolution (DIM.5) empowers the identification, understanding, and resolution of problems across various environments, including education (Lourenço et al., 2023). To foster this process effectively, Kafel (2020) contends in his doctoral thesis that it is imperative for secondary teachers to cultivate personal skills associated with positive interaction, such as effective communication, empathy, active listening, mediation, and problem-solving. These skills are paramount for educators, equipping them to address conflicts adeptly (Galindo et al., 2022; Grau et al., 2016; Valdés et al., 2018), with positive outcomes anticipated (Baykal, 2019). Creating safe spaces where students can openly discuss their experiences, feel heard, and seek assistance is deemed essential (Nagar & Talwar, 2023). Conversely, unsuccessful attempts to resolve conflict situations are correlated with a deficiency in teaching skills for conflict management (Levi-Keren et al., 2022). Furthermore, Valente and Lourenço (2022) asserted and demonstrated that the effective implementation of actions to positively resolve conflicts hinges on basic education teachers' proficiency in managing interpersonal relationships. Consequently, a causal relationship is posited between the mastery of conflict management skills and the actions undertaken by teachers to address antisocial cyber behavior. This will allow teachers to identify early signs of antisocial cyber-behaviour and online interaction problems between students, as "teachers have an essential role in conflict prevention and intervention" (Ceballos & Rodríguez, 2023, p. 553).
- The civic competences factor (DIM.6) for teachers in managing students' antisocial cyber behavior is deemed 'key in providing youth with the skills and competencies necessary to be active citizens' (p. 1), contributing to the common good and the functioning of democracy (Bringle et al., 2019). Various authors have highlighted that individuals cultivating such competences are more inclined to contemplate the consequences of their antisocial behaviors (Vieno et al., 2007) and exhibit heightened civic behavior (Ferguson & Colwell, 2018). Furthermore, these competences play a substantial role in fostering skills for resolving conflicts constructively and peacefully. In our context, this pertains to teachers' proficiency in managing antisocial conflicts, as evidenced by scientific studies demonstrating that these skills facilitate effective communication in employees, a fundamental aspect of problem-solving (Eylachew, 2016). Hence, the development of civic competences for teachers emerges as a crucial prerequisite that can significantly influence the strategies and actions they deploy in the classroom with their students, particularly in addressing antisocial behavior.
- The factor of teachers' actions to nurture students' emotional competences (DIM.7) holds immense significance due to its positive impact on students' holistic development (Llorent et al., 2020). This not only contributes to their personal well-being (Guerra et al., 2019) but also aids in preparing students to be responsible citizens in an increasingly diverse and globalized world (Sánchez, 2017). Hence, Pacheco et al. (2016) underscore the notion that "to have emotionally intelligent students, it is necessary to provide teachers with specific strategies and training in emotional skills" (p. 65), where adequate teacher training in emotional intelligence subsequently influences their conflict resolution skills and management (Valente & Lourenco, 2020). Furthermore, the development of emotional intelligence plays a pivotal role in the prevention and management of antisocial behavior (Romero et al., 2016). Given this premise, we contemplate whether the actions undertaken by teachers with their students to cultivate emotional competences have an impact on their efforts to address antisocial cyber behavior and on their proficiency in managing these conflicts.
- The factor 'teacher actions to address antisocial behavior (DIM.4) encompasses the strategies and measures a teacher should employ to tackle, alleviate, and resolve antisocial behavior within the school environment (Mora et al., 2021). These actions aim to cultivate a school environment that is not only safe (Matus, 2020) but also respectful and conducive to learning (Mayer, 1995). We posit that by amalgamating the development of emotional skills and civic competences in students by teachers, along with their beliefs, a robust foundation is laid for the constructive resolution of conflicts across various situations—be it personal, social, or professional.

Within this conceptual framework, this study bears significant implications for both educational practice and the methodological landscape. On the first front, addressing antisocial behavior effectively among students is crucial, emphasizing the need to foster a positive environment within and beyond the school. As for the second aspect, the utility of PLS-SEM modelling becomes evident, particularly in probing multidimensional constructs or models characterized by intricate structures, exemplified in Fig. 1. This approach proves particularly valuable as, to date, there is a dearth of causal models exploring the analyzed topic.

Therefore, this study postulated the following hypothesis:

– H1: DIM.1 factor is a significant predictor of DIM.2 factor.

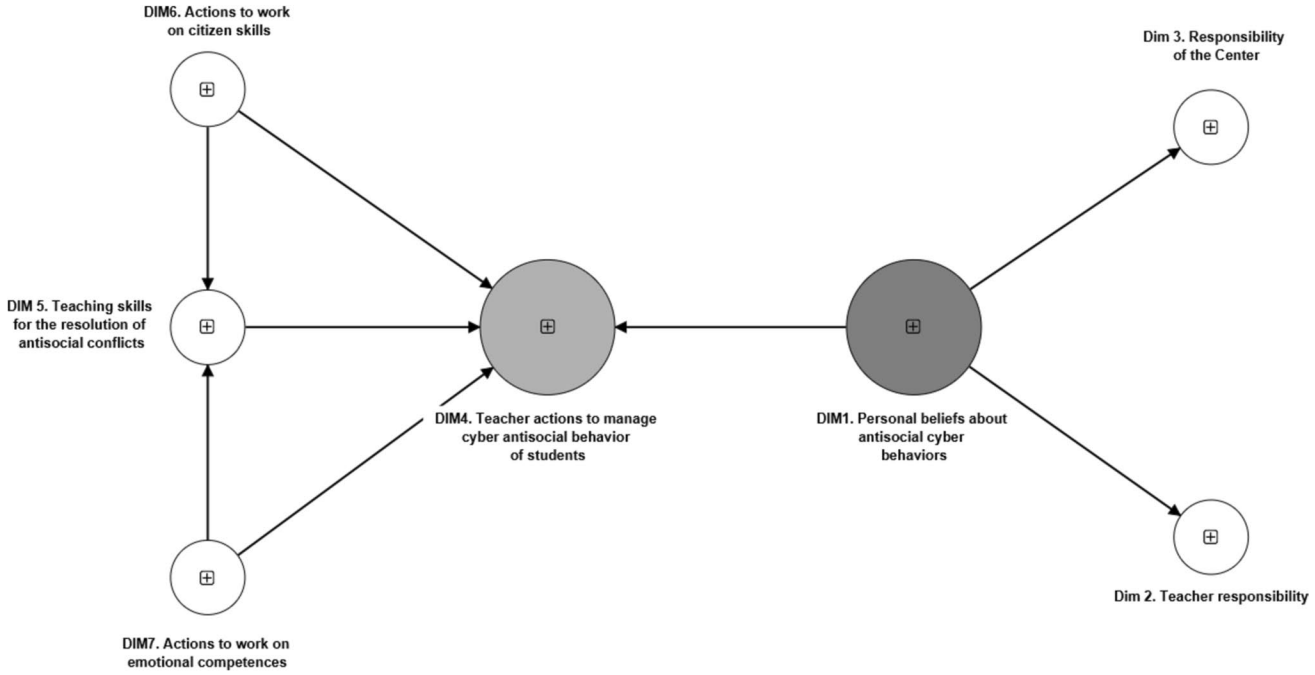

Fig. 1 Teachers' efforts to manage antisocial behaviour of students. Source: own elaboration

- H2: DIM.1 factor is a significant predictor of DIM.3 factor.
- H3: DIM.1 factor is a significant predictor of DIM.4 factor.
- H4: DIM.5 factor is a significant predictor of DIM.4 factor.
- H5: DIM.6 factor is a significant predictor of DIM.4 factor.
- H6: DIM.6 factor is a significant predictor of DIM.5 factor.
- H7: DIM.7 factor is a significant predictor of DIM.4 factor.
- H8: DIM.7 factor is a significant predictor of DIM.5 factor.

Methodology

Design and sample

A quantitative, non-experimental approach with a cross-sectional design has been adopted. Since the instrument applied follows a causal model, its nature is descriptive-explanatory, which allows the analysis of the relationship between the different factors through the use of theoretical models. (Cepeda-Carrion et al., 2018). The sampling carried out was non-probabilistic and intentional. The sample consisted of active teachers from various educational stages from Spain, who taught in the following educational stages: Early Childhood Education, Primary Education, Secondary Education, Adult Education and Vocational Training. To collect the data, the researchers contacted the head of studies or secretary of the educational center via email, providing them with a link to the survey and guaranteeing the confidentiality and protection of personal data. Subsequently, this person from the management team contacted the teaching staff in order to complete the survey. This process was carried out in the last semester of 2023. Table 1 details the distribution of active teachers according to various demographic variables.

Estimation Techniques, Software and Initial Version of the Instrument

In analysing this study, SmartPLS 4, a powerful and widely employed software for structural equation modelling software, was utilized (Ringle et al., 2015). SmartPLS, Partial Least Squares (PLS), is a comprehensive tool for its flexibility in handling complex models and non-normal data distributions (Rigdon, 2012; Ringle et al., 2015). This software is precious in estimating reflective and formative measurement models, providing robust results for researchers in various disciplines (Hair, et al., 2021). The survey instrument embraced a 7-point Likert scale, a commonly adopted metric in social science research. Each point on the Likert scale corresponds to a specific level of agreement to disagreement, allowing for nuanced responses and detailed analysis of participants' perspectives (Babbie, 2016; DeVellis, 2016; Likert, 1932).

Table 1 Sample distribution of in-service teachers

Demographics			
Gender	Female (69.60%, $n=581$)	**Educational Stage**	Early Childhood (6.70%, $n=56$)
	Male (30.40%, $n=254$)		Primary Education (42.40%, $n=354$)
Age	Female (45.76 ± 9.33)		Secondary Education (35.60%, $n=297$)
	Male (45.36 ± 10.78)		Adult Education (6.20%, $n=52$)
			Vocational training (9.10%, $n=76$)

To evaluate teacher responses in addressing antisocial cyber behaviour, the research utilized five constructs (DIM 1, DIM 4, DIM 5, DIM 6, and DIM 7). Among these, DIM 1 is a reflective higher-order construct, encompassing two reflective lower-order constructs (DIM 2 and DIM 3) (Crocetta et al., 2021). The analysis used the repeated indicators approach since the study consists of a higher-order construct/hierarchical component model in a reflective-reflective structure (Wilson & Henseler, 2007). All lower-order and higher-order components are assessed for measurement model reliability and validity (Sarstedt et al., 2019). The model forms the direct relationships between exogenous and endogenous variables and is assessed using path coefficients. The study's constructs are evaluated based on the quality of the measurement model. The evaluation process begins with assessing the factor loadings, followed by establishing the construct reliability and discriminant validity (Koufteros et al., 2009). Table 2shows the items of each dimension together with their corresponding code.

Results

Assessment of the Lower-order Model

Factor loading refers to the degree of correlation between each item in the correlation matrix and the given principal component. Factor loadings can range from -1.0 to $+1.0$, with higher absolute values indicating a stronger correlation of the item with the underlying factor. In the study, none of the items had a factor loading less than the recommended value of 0.50 (Hair et al., 2019; Pett et al., 2003). The items are converging to the latent variables.

The two most widely used methods for establishing reliability are Cronbach's Alpha and Composite Reliability (CR). The results for both Cronbach's Alpha and Composite Reliability are presented in Table 3. Items 4.1, 4.2, 4.3 and 4.4 were eliminated since they did not fit the recommended criteria. The Cronbach's Alpha values ranged from 0.833 to 0.971, while the Composite Reliability statistics ranged from 0.854 to 0.974. Both reliability indicators have reliability statistics over the required threshold of 0.70 (Hair et al., 2019).

Fornell-Larcker criterion and HTMT ratios are used to check the Discriminant validity. According to Fornell and Larcker (1981), when the factor loading value is greater than or equal to the recommended value of 0.50, the items converge to measure the underlying construct, and hence convergent validity is established. In the current study, the convergent validity results based on the average variance extracted (AVE) statistics show that all the constructs have an AVE value greater than 0.50. Therefore, convergent validity is established. Table 4 shows the AVE values for each construct.

The HTMT measures the similarity between latent variables based on estimating the correlation between the constructs. Discriminant validity is established based on the HTMT ratio. However, the threshold for HTMT has been debated in existing literature, while Teo et al. (2008) recommend a liberal threshold of 0.90 or less. The HTMT results show (Table 5) that the HTMT ratio for the study is less than the required threshold of 0.90. Hence, discriminant validity is achieved.

Assessment of the Structural Model

To carry out the model evaluation, Wim Van den Noortgate & Patrick Onghena (2006) recommended five consecutive steps: (1) multicollinearity analysis; (2) path analysis; (3) finding out the coefficient of determination (R^2); (4) finding out the effect size coefficient (f^2); (5) predictive relevance of the model. Table 6 shows the values obtained through this procedure, for each hypothesis.

Multicollinearity was assessed through the variance inflation factor (VIF) (Mason & Perreault, 1991), where values exceeding 3 indicate collinearity issues (Hair et al., 2019). Table 6 displays the VIF values for the formative factors in the proposed model, demonstrating values below 3, indicating an absence of significant collinearity problems.

The bootstrapping procedure was used to test the significance of the path (the directional relationships between the latent factors). This procedure involves taking many subsamples (e.g., 10,000) from the original sample with replacement to give bootstrap standard errors, which in turn gives approximate t-values for significance testing of the structural path. The bootstrapping procedure shows the path coefficient (p-value), standard deviation (SD), t-statistic (t-value), and

Table 2 Initial instrument

DIM.1 Personal beliefs about antisocial cyber behaviors (higher order construct)	
DIM. 2 Teacher responsibility (lower order construct)	
DIM2.1	I believe that antisocial cyberbehavior should be included in the curriculum as didactic content
DIM2.2	I consider that antisocial cyber-behavior is a serious problem to work on with my students
DIM2.3	I believe that the rules to prevent antisocial cyber-behavior should include conflicts both inside and outside the educational center
DIM2.4	I consider it my responsibility to know if there is antisocial cyber behavior among my students
DIM.3 Responsibility of the center (lower order construct)	
DIM3.1	I consider that my school should have a program to prevent antisocial cyberbehavior
DIM3.2	I consider that the educational project of my school should contemplate the fight against antisocial cyberbehavior
DIM3.3	I believe that my school should train and advise students on how to solve antisocial cyberbehavior
DIM3.4	I consider that my school should train teachers to prevent antisocial cyberbehavior
DIM3.5	I believe that my school should promote greater awareness about antisocial cyberbehavior
DIM3.6	I believe that teachers should organize workshops with students to prevent antisocial cyberbehavior
DIM3.7	I consider that the school council of my educational center should organize pedagogical activities to prevent antisocial cyberbehavior
DIM3.8	I believe that there should be a multidisciplinary work team made up of specialized agents to investigate when serious antisocial cyberbehavior occurs
DIM3.9	I believe that the teachers at my center should work together with families to prevent this type of behavior
DIM3.10	I believe that the school guidance team should work with all members of the educational community to prevent antisocial cyberbehavior
DIM3.11	DIM3.11—I believe that the educational guidance team (EOI) should develop training programs that allow teachers to know how to manage the mediation and resolution of antisocial cyberbehavior
DIM4.Teacher actions to manage cyber antisocial behavior of students	
DIM4.1	I work daily to resolve problems related to antisocial cyberbehavior that occur with the students of my educational center
DIM4.2	I work daily to resolve problems related to antisocial cyberbehavior that occur with my students and people outside the educational center
DIM4.3	Every year I develop with my students the principles and rules to prevent antisocial cyberbehavior
DIM4.4	I inform on the notice board in my classroom of the sanctions that will be applied when antisocial cyber behavior occurs
DIM4.5	I get personally and professionally involved in mediating among my students when I am aware that there is antisocial cyber behavior
DIM4.6	I frequently insist that my students notify me if they observe antisocial cyberbehavior
DIM4.7	I try to create a school environment free of antisocial cyber behavior
DIM4.8	If I discover antisocial cyber behavior on my students' social networks, I promote values of respect and tolerance in class
DIM4.9	If I discover antisocial cyberbehavior, I apply the protocol that I must follow
DIM.5. Teaching skills for the resolution of antisocial conflicts	
DIM5.1	I consider that I have the necessary social skills so that students who suffer from antisocial cyberbehavior can rely on me to solve them

Table 2 (continued)

DIM5.2	I consider that I have sufficient skills to identify antisocial cyberbehavior among my students
DIM5.3	I consider that I have sufficient skills to manage antisocial cyberbehavior among my students
DIM5.4	I consider that I have sufficient knowledge about antisocial cyberconduct policies and plans
DIM6. Actions to work on citizen skills	
DIM6.1	Promotion of values and beliefs in students about respect for others
DIM6.2	I promote intercultural relationships that favor a good climate of coexistence in the classroom
DIM6.3	I work on different dynamics in the classroom to make students aware of the importance of tolerating cultural differences
DIM6.4	I teach to respect personal differences among my students as something valuable to facilitate their identity development
DIM6.5	He instilled in my students the importance of not using labels or making moral judgments that violate the dignity of the person
DIM6.6	I promote through work dynamics the construction of positive judgments among my students regarding their identity characteristics
DIM6.7	I maintain an egalitarian dialogue with my students to develop principles and rules that respect the diversity of opinions
DIM7. Actions to work on emotional competences	
DIM7.1	Weekly, I encourage my students to empathize with their classmates when they express sadness
DIM7.2	I promote active listening daily as an empathetic strategy to create emotional ties between students
DIM7.3	I encourage students weekly to expose their intrapersonal and interpersonal emotions in class
DIM7.4	I work weekly with students on various socio-emotional situations in a reflective manner
DIM7.5	I encourage my students weekly to reflect on possible solutions to socio-emotional problems

Own elaboration

significance value with a 95% interval (p-value) (Hair et al., 2019; Fornell and Larcker, 1981). Table 6 shows the hypothesis testing results and values obtained from the procedure.

The structural model indicates the following results regarding our hypothesis. Hypothesis 1 determines whether personal beliefs about antisocial cyber behaviors are a significant predictor of teacher responsibility. The results showed a significant relationship between both factors ($\beta = 0.814$, t-value = 46.625, $p < 0.001$), accepting H1. Hypothesis 2 tested whether personal beliefs about antisocial cyber behaviors are a significant predictor of responsibility of the center. The results showed a significant and positive relationship ($\beta = 0.984$, t-value = 829.638, $p < 0.001$), so H2 is supported. H3 hypothesized that personal beliefs about antisocial cyber behaviors are a significant predictor of teacher actions to manage cyber antisocial behavior of students. PLS-SEM results revealed that teachers' personal beliefs about cyber antisocial behaviors significantly influence how they manage such behavior in students ($\beta = 0.379$, t-value = 9.366, $p < 0.001$) which argues for H3. Hypothesis 4 determines whether teaching antisocial conflict resolution skills is a significant predictor of teacher actions to manage students' cyber antisocial behavior. The results showed a significant relationship between both factors ($\beta = 0.357$, t-value = 9.97, $p < 0.001$), accepting H4. Hypothesis 5 tested if actions to work on citizen skills is a significant predictor of teacher actions to manage cyber antisocial behavior of students. The results showed a significant and positive relationship ($\beta = 0.208$, t-value = 7.056, $p < 0.001$) so H5 is supported. Hypotheses 6 focus on whether actions to work on citizen skills is a significant predictor of Teaching skills for the resolution of antisocial conflicts. The significant and positive relationship between both factors was also accepted ($\beta = 0.292$, t-value = 7.435, $p < 0.001$). Regarding hypothesis 7, it was analyzed whether actions to work on emotional competencies are a significant predictor of teacher actions to manage students' cyber antisocial behavior. The results did not show a significant relationship, so H7 was rejected ($\beta = -0.096$, t-value = 0.388, $p > 0.001$).

Table 3 Loading, α, CR, AVE

Constructs/Items	Loading	α	CR	AVE
DIM.1. Personal beliefs about antisocial cyber behaviors		0.963	0.966	0.671
DIM.2. Teacher responsibility		0.833	0.841	0.669
DIM2.4	0.749			
DIM2.1	0.786			
DIM2.2	0.853			
DIM2.3	0.876			
DIM.3. Responsibility of the center		0.971	0.972	0.778
DIM3.8	0.810			
DIM3.7	0.828			
DIM3.6	0.844			
DIM3.9	0.850			
DIM3.1	0.877			
DIM3.11	0.905			
DIM3.5	0.906			
DIM3.2	0.909			
DIM3.10	0.915			
DIM3.3	0.915			
DIM3.4	0.935			
DIM4. Teacher actions to manage cyber antisocial behavior of students		0.915	0.916	0.745
DIM4.6	0.836			
DIM4.9	0.852			
DIM4.5	0.866			
DIM4.8	0.871			
DIM4.7	0.891			
DIM5. Teaching skills for the resolution of antisocial conflicts		0.932	0.940	0.830
DIM5.1	0.891			
DIM5.2	0.939			
DIM5.3	0.953			
DIM5.4	0.859			
DIM6. Actions to work on citizen skills	0.959	0.959	0.961	0.804
DIM6.1	0.908			
DIM6.2	0.928			
DIM6.3	0.852			
DIM6.4	0.922			
DIM6.5	0.943			
DIM6.6	0.816			
DIM6.7	0.900			
DIM7. Actions to work on emotional competences		0.942	0.949	0.812
DIM7.1	0.895			
DIM7.2	0.887			
DIM7.3	0.893			
DIM7.4	0.916			
DIM7.5	0.914			

Own elaboration

Finally, hypothesis 8 tests the relationship between teachers' actions to work on emotional competencies and teaching skills for resolving antisocial conflicts. The connection between both factors is significant, reporting a t-value of 5.903 ($\beta = 0.23$, $p < 0.001$). Therefore, H8 is accepted.

The coefficient of variance explains the predictor power of the variables (Coefficient of determination—R^2); all the endogenous variables on the model had good explanatory power and were DIM2 = 0.662, DIM3 = 0.969, DIM4 = 0.503, except DIM5 = 0.216 which was poor (Hair

Table 4 Fornell-Larcker criterion

	DIM 5	DIM4	DIM6	DIM7	DIM 2	DIM 3
DIM 5	.911					
DIM4	.557	.863				
DIM6	.426	.514	.897			
DIM7	.400	.312	.583	.901		
DIM 2	.466	.569	.476	.361	.817	
DIM 3	.349	.569	.541	.356	.696	.882

Own elaboration

Table 5 Heterotrait-Monotrait Ratio (HTMT)

	DIM 5	DIM4	DIM6	DIM7	DIM 2	DIM 3
DIM 5						
DIM4	.601					
DIM6	.446	.545				
DIM7	.423	.329	.610			
DIM 2	.527	.639	.523	.408		
DIM 3	.361	.599	.555	.364	.774	

Own elaboration

Table 6 Structural model

Hypothesis	Relationship	VIF	β	SD	t-value	*p*-value	Supported	f^2
H3	DIM 1—> DIM 4	1.514	0.379	0.040	9.366	0.001	Yes	0.191
H2	DIM 1—> DIM 3	1.000	0.984	0.001	829.638	0.001	Yes	31.088
H1	DIM 1—> DIM 2	1.000	0.814	0.017	46.625	0.001	Yes	1.961
H4	DIM 5—> DIM 4	1.329	0.357	0.036	9.97	0.001	Yes	0.193
H5	DIM 6—> DIM 4	1.930	0.208	0.044	7.056	0.001	Yes	0.045
H6	DIM 6—> DIM 5	1.515	0.292	0.039	7.435	0.001	Yes	0.072
H7	DIM 7—> DIM 4	1.585	−0.096	0.036	0.388	0.698	No	0.012
H8	DIM 7—> DIM 5	1.515	0.23	0.039	5.903	0.001	Yes	0.044

et al., 2021). Figure 2 shows that the model has good explanatory power.

The effect size coefficient (f^2) is used to assess the strength of the relationship between the factors. This was calculated using the procedure proposed by Cohen (1988), where a value equal to or less than 0.02 is a small effect, 0.15 is medium, and greater than 0.35 is a significant effect. In this study, the effect size ranged between 31.088 and 0.012. Out of eight relationships, four were low and medium to large effect, with two each. According to Hair et al. (2021), the model has predictive relevance (Q^2), Dim 4 score was 0.409 and Dim 5 score was 0.212 both the variables have large predictive scores.

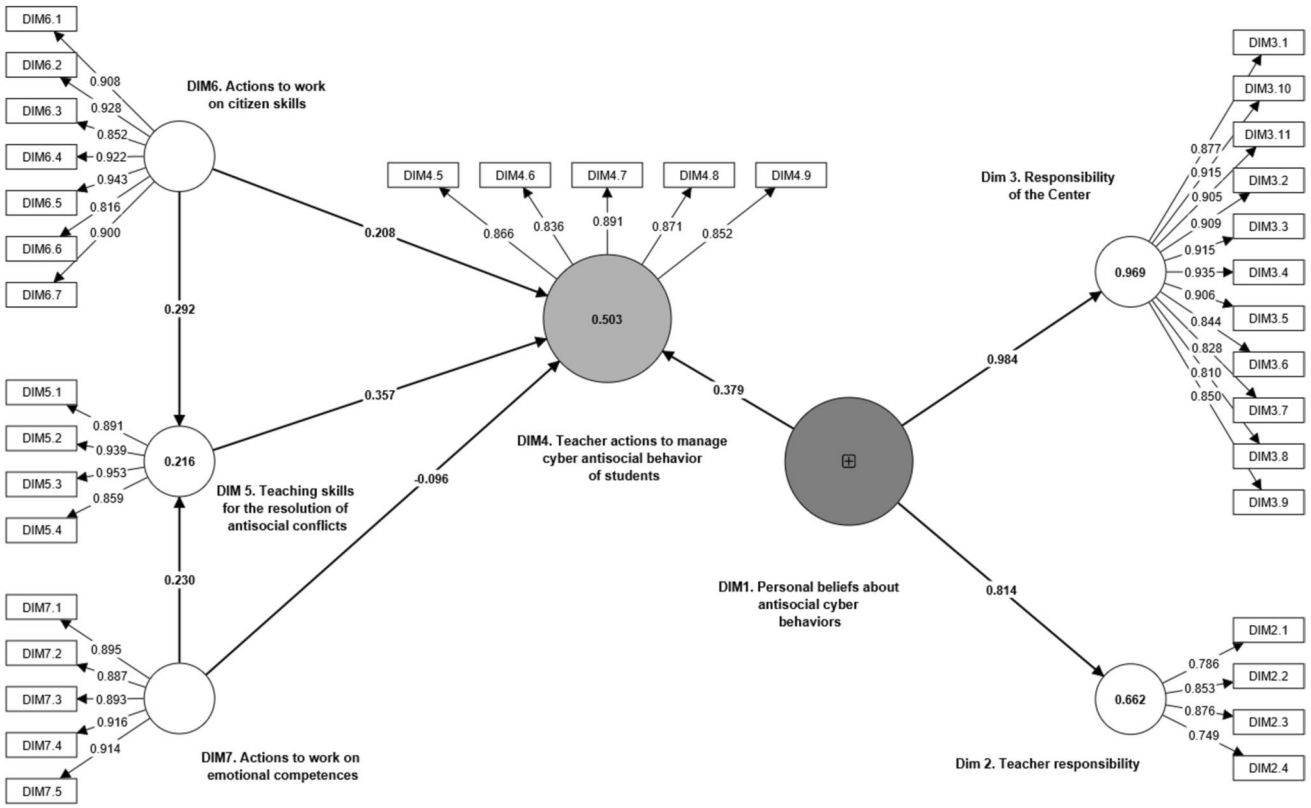

Fig. 2 Smart-PLS—Path Analyses with R-Square Values. Source: Authors' calculations

Discussions and conclusions

Given the issue of antisocial cyber behavior among students (González Sodis & Leiva, 2022; Tirado, 2022) and the potential role that teachers play in addressing such conflict situations (Calderón, 2020; Gaeta et al., 2020), this paper is centered on investigating the actions taken by teachers to address antisocial cyber behavior. In pursuit of this objective, we conducted an analysis to assess the influence of variables such as the emotional and civic competences promoted by teachers in students, as well as teachers' beliefs regarding these cyber behaviors and their proficiency in resolving them.

The ultimate version of the instrument comprised a total of 36 items, grouped into distinct factors: the overarching 'teacher beliefs about antisocial cyber behavior' (15 items), further divided into two sub-categories, teacher responsibility (4 items) and school responsibility (11 items); the specific 'teacher actions to work on civic competences with students' (7 items); the dedicated 'teacher's actions to work on students' emotional competences' (5 items); the specialized 'teacher's skills in resolving students' antisocial conflicts' (4 items); and the pivotal 'teacher's actions to manage antisocial cyber behavior' (5 items). This final instrument successfully met the psychometric criteria essential for any causal measurement tool. More in detail, the model underwent rigorous testing for excellent reliability, as advocated by Hair et al. (2019), and demonstrated adequate discriminant validity, as recommended by Fornell and Larcker (1981) and Teo et al. (2008), affirming the proper alignment of all items with their respective factors.

All stated hypotheses were verified, except for one, and the findings are discussed below. Concerning the first hypothesis (H1), it was confirmed that a significant relationship exists between teachers' beliefs about their responsibility for managing antisocial cyber behaviors and their actions to address such behaviors. This confirmation aligns with the conclusions of Mansour (2013) and Muliyah and Aminatun (2020). Santos and Miguel (2019) emphasized that "teachers' beliefs could be a factor influencing classroom practices" (p.13) and that "these beliefs may impact their actions" (Beck et al., 2000, p.324). Consequently, teachers' beliefs regarding the responsibility of both the school and the teaching staff in preventing and managing aggressive and delinquent behavior in virtual environments contribute to the formulation of clear technology usage policies within schools (Donat et al., 2023). Moreover, these beliefs motivate teachers to develop and implement educational actions aimed at mitigating the emergence of such behaviors, fostering the safe and responsible use of technology (Lauricella

et al., 2020). The confirmed findings also indicate that the growth of the lower-order factors (DIM.1 and DIM. 2) significantly contributes to the overall growth of the higher-order factor DIM. 4 (H2—H3). Therefore, hypotheses H2 and H3 were unequivocally validated. In simpler terms, the growth of one internal factor has the capacity to enhance the other internal factor of teachers' beliefs, demonstrating a highly advantageous phenomenon in terms of increasing teachers' actions in cyber conflict resolution. This observation holds particular significance in the context of designing training plans that bring about a substantial and positive change in teachers' beliefs (Arbeau & Coplan, 2007).

Concerning the fifth hypothesis (H5), it was verified that the teacher's actions to enhance students' civic competences are indeed connected to the teacher's own actions in managing cyber behaviors. Both approaches aim to cultivate responsible and ethical students capable of thriving in social harmony, aligning with the insights of De Schaepmeester et al. (2022). This holds true not only in educational and extracurricular settings but also in digital environments, where the teacher assumes a pivotal role in this educational process. Given that the primary objective is to foster responsible and ethical online behavior among students, addressing aspects like diversity, pluralism, or social injustice, as emphasized by Byker (2016), becomes crucial in reducing potential antisocial cyber behaviors (Bear, 2020). For instance, these strategies can be implemented through group dynamics techniques such as role-play, where students engage in peaceful conflict resolution for issues like grooming or cyberbullying (Saputra et al., 2020). This approach enables students to enhance their skills, finding common ground and collaboratively addressing differences through peaceful dialogue, as recommended by Muhonen et al. (2022). Ultimately, this helps students learn the importance of respecting others in virtual and digital environments. Moreover, the model evaluation confirmed the causal relationship outlined in hypothesis number 6 (H6), establishing an intrinsic connection between the actions that teachers undertake in the classroom to foster civic competences and their skills in managing antisocial cyber conflicts. By promoting civic competences in the classroom and creating an environment conducive to dialogue, mutual respect, active participation, and effective communication (Eylachew, 2016), the development of conflict resolution skills can be strengthened. These skills, in turn, enable the constructive addressing of civic disagreements (Nagar & Talwar, 2023) and empower students to become responsible and engaged citizens in a democratic society (Bringle et al., 2019; Ferguson & Colwell, 2018). This underscores the active role that teachers should play in conflict resolution, emphasizing the importance of implementing training processes that equip them to positively manage interpersonal relationships (Baykal, 2019; Galindo et al., 2022).

The relationship outlined in H4, connecting teachers' skills in managing antisocial cyber conflicts (DIM. 5) with teachers' actions to manage and work with students' antisocial cyber behavior (DIM. 4), is noteworthy and has been affirmed. H4 demonstrated a significant and positive correlation between both constructs, aligning with the findings of Valente and Lourenço (2022). This may be attributed to the fact that when teachers serve as role models for students and exhibit effective conflict resolution skills in their own behavior and interactions with others (Grau et al., 2016; Valdés et al., 2018), including the development of personal skills associated with effective communication, empathy, active listening, or mediation (Kafel, 2020), students are more likely to learn and adopt these skills. Furthermore, Valente and Lourenço (2022) suggested that if teachers are adequately trained in managing interpersonal relationships, it could positively influence the implementation of dynamics, strategies, and/or actions conducted in the classroom to address potential conflicts, specifically antisocial cyber behaviors in this case.

Given the complexities associated with addressing antisocial cyber behavior in the school context, which are influenced by various interconnected factors, the teaching staff emerges as a pivotal component. Based on the "European Strategy for a Better Internet for Children" (European Union, 2012) and its proposals in “Better Internet for Children: Teachers and Educators” (European Union, 2024), along with regulations in Spain such as the “National Digital Competence Plan” (Ministerio de economía, comercio y empresa, 2021) and the “Digital Competence Framework for Teachers” (INTEF, 2022), the results of this study provide a diagnosis that can guide the implementation of training programs aimed at strengthening teachers' digital and civic competencies. The identification of key factors such as teachers' beliefs, conflict resolution skills, and their ability to foster emotional and civic competencies in students will enable educators not only to more effectively manage antisocial behavior in digital environments (Galindo et al., 2022) but also to implement school policies and pedagogical strategies aligned with current regulations (Donat et al., 2023). Specifically, the training should include modules on the early identification of antisocial cyber behaviors (detachment from personal relationships; lack of participation in digital activities), responsible use of technology by students (understanding different digital platforms; managing digital identity; privacy and security settings), intervention and resolution strategies (emotional support; mediation; conflict resolution; promoting digital citizenship), and educational legislation and policies (child protection; national, local, and school protocols against virtual harassment).

This training should be incorporated into both initial teacher education (before educators begin working with students) and ongoing professional development, continuously

updating teaching competencies to adequately respond to emerging challenges posed by antisocial online behaviors. In this way, teachers will not only be better equipped to prevent and manage online conflicts but will also contribute to the development of a safe and respectful educational environment, in line with current legal and social demands (Bear, 2020).

However, it is essential to acknowledge a limitation highlighted by this study, which pertains to the absence of qualitative exploration into teachers' perspectives regarding their role in addressing antisocial cyber behavior. Additionally, the study did not delve into the analysis of other potential contributing factors, such as axiological competence, digital ethics, or prior experiences related to the studied phenomenon. To address this limitation, the suggestion is put forth for future research to incorporate interviews with teachers. This qualitative approach aims to complement and enrich the quantitative findings, providing a more comprehensive understanding of the complexities surrounding teachers' roles in mitigating antisocial cyber behavior. Furthermore, future investigations could explore socioemotional competences and explore their mediating role in the development of teaching skills for effectively managing antisocial cyber behavior.

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Declarations

Ethical Approval This study has not been carried out with human or animal participants.

Consent to Participate The authors do not have any type of interests.

Consent for Publication All authors have accepted the submission of the article to the Journal, accepting the issuance of rights.

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