

Explaining the Impact of Cyberspace on the Political Socialization Process of Students and the Role of Educational Administrators in Guiding It

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ABSTRACT

Purpose: This study aimed to examine the impact of cyberspace on the political socialization dimensions of upper-secondary students and to analyze the extent to which educational administrators actively guide this evolving process.

Methods and Materials: This applied, quantitative study employed a survey design targeting upper-secondary students and school administrators in Tehran during the 2024–2025 academic year. A multistage stratified random sampling method selected 380 students and 120 administrators. Data were collected using two validated and reliable researcher-developed questionnaires assessed through expert review and Cronbach's alpha coefficients of 0.89 and 0.91, respectively. Statistical analysis was conducted using SPSS 26, employing descriptive indicators and inferential tests including Pearson correlation coefficients and independent t-tests, alongside structural equation modeling to evaluate the strength, direction, and significance of hypothesized relationships between cyberspace use and dimensions of political socialization.

Findings: Pearson correlation analysis revealed significant and positive relationships between cyberspace use and political knowledge ($r = 0.421, p < 0.01$), political attitudes ($r = 0.388, p < 0.01$), and political participation ($r = 0.312, p < 0.01$). Structural equation modeling confirmed the significance of all three hypothesized effects, with standardized coefficients indicating a strong positive effect of political participation ($\beta = 0.79, T = 10.79$), political knowledge ($\beta = 0.56, T = 4.65$), and political attitudes ($\beta = 0.51, T = 2.88$) on cyberspace use. Model fit indices (IFI = 0.98, NNFI = 0.96, RMSEA = 0.060) indicated an excellent overall fit.

Conclusion: Cyberspace significantly enhances students' political knowledge, shapes their political attitudes, and increases their inclination toward participation, while school administrators currently play a predominantly passive role.

Keywords: *Cyberspace, political socialization, students, educational administrators, digital citizenship.*

1. Introduction

The accelerating expansion of social media and digital communication environments has reconfigured fundamental mechanisms of political cognition, identity development, and civic participation among younger generations. As digital platforms increasingly function as primary arenas for information exchange, political discourse, and collective action, scholars note that the boundaries between social interaction and political engagement have become fluid and intertwined (Vromen et al., 2015). In contemporary societies, this transformation is even more pronounced among adolescents, who constitute the most active demographic in cyberspace and who often encounter political symbols, narratives, and debates before they receive formal instruction on political systems or civic responsibility. This emergent dynamic has generated considerable scholarly attention, leading to extensive debate on how virtual environments influence political socialization—a process traditionally shaped by family, school, community, and mass media.

Digital citizenship has emerged as a critical concept in understanding the evolving relationship between youth and online political ecosystems. According to Ribble, digital citizenship encompasses responsible, informed, and ethical use of technology, highlighting competencies that students must acquire to navigate increasingly complex online environments (Ribble, 2015). These competencies extend beyond technical skills and include digital safety, media literacy, responsible communication, and civic engagement in virtual spaces. As the political function of social media intensifies, digital citizenship becomes an essential prerequisite for mitigating misinformation, enhancing critical thinking, and guiding political behavior. In contexts where adolescents spend extended hours on social platforms, the absence of structured digital citizenship education poses risks such as susceptibility to radicalization, exposure to political manipulation, and reinforcement of biased attitudes.

The growing centrality of digital platforms in shaping youth political participation is further evident in recent empirical research. Yin's analysis of social media affordances demonstrates how platform design influences user engagement patterns, amplifies visibility, and enables new forms of identity expression and social coordination (Yin, 2025). These affordances, although originally designed for commercial engagement, have transformed the everyday experiences of young users, making political

content ubiquitous and often unavoidable. Similarly, research on sociopolitical events in the Middle East and beyond highlights the major role that social media plays in mobilizing public sentiment, constructing narrative frames, and facilitating rapid information diffusion. Mahboob's investigation into the November 2019 protests in Iran shows how social platforms serve as catalysts for expressing grievances and coordinating political action, even under conditions of state surveillance and restricted information flows (Mahboob et al., 2025). These observations underscore the capacity of social media environments to redefine youth political attitudes and behaviors, sometimes in highly volatile sociopolitical contexts.

In addition to their capacity for mobilization, digital platforms have transformed communication patterns and political marketing strategies. Hu emphasizes that the evolution of social media affordances—such as personalization algorithms, interactive content, and influencer-driven communication—has reshaped the landscape of digital marketing, where political messages circulate rapidly and competitively (Hu, 2025). Consequently, adolescents may be exposed to politically charged content without seeking it, as algorithms prioritize engagement and emotional response over balanced information. This dynamic increases the importance of educational institutions in equipping students with analytical competencies to critically assess online political information. Meanwhile, in many developing contexts, the role of schools and educational managers remains insufficiently articulated, leaving adolescents to navigate political information ecosystems without structured guidance.

Given the increasing politicization of social media interactions, the impact of cyberspace on electoral behavior and political culture has become a major scholarly concern. A case study conducted by Azadi and colleagues on the political participation of citizens in Iran's presidential election reveals that social media plays a significant role in shaping voting behavior, particularly by influencing perceptions of candidates, amplifying political debate, and encouraging civic engagement (Azadi et al., 2025). These insights align with global research demonstrating that online networks function as spaces for political persuasion, political identity formation, and norms of participation. The rapid dissemination of political imagery and slogans within online communities creates a collective sense of immediacy and shared meaning, especially among youth who are still forming their political worldviews.

Political mobilization in digital environments has also been a focus of comparative studies, particularly in South Asia and other regions undergoing technological transformation. Kharel's examination of cyber-politics highlights how digital platforms accelerate political mobilization by enabling real-time communication, peer influence, and horizontal sharing of political resources (Kharel & Bhakta, 2024). Similarly, Kenesov's work on digital citizenship underscores the ways in which social media infrastructures facilitate youth political activism and civic engagement, often blurring the line between political expression and social expression (Kenesov, 2024). These findings collectively suggest that the political agency of adolescents is no longer confined to traditional institutions such as schools or state media; rather, cyberspace has become a primary arena for constructing political meaning and initiating political action.

Beyond political participation, digital media increasingly mediate communication between citizens and public institutions. Cerf's analysis of intermediation work in public policy contexts illustrates how digital platforms serve as interactive spaces for negotiation, dialogue, and collective problem-solving (Cerf et al., 2024). Although Cerf's work focuses on territorial food policy, the conceptual implications extend to youth civic engagement: students exposed to online participatory mechanisms may internalize expectations for responsiveness and transparency in political systems. This transformation impacts school environments, where educators and administrators must adapt to new modes of communication and civic expression among students. Without adequate digital literacy training, school leaders may struggle to identify emerging political trends in students' online interactions or guide them constructively.

The psychological dimensions of digital political engagement also require careful consideration. Cao's research on social media sentiment shows that emotional responses generated within digital environments have real-world implications, extending even into economic markets (Cao, 2024). When applied to political contexts, such findings imply that adolescents' emotional reactions to political messages—often shaped by sensationalist or polarizing online content—may influence their political attitudes and decisions. Adolescents, whose cognitive frameworks are still developing, may be particularly vulnerable to emotionally charged political cues, including misinformation, propaganda, and extremist narratives. In such cases, educators must intervene not by restricting

digital use but by fostering reflective judgment and emotional regulation.

Political culture, as shaped by new media environments, has been analyzed within the Iranian context as well. Babakhani argues that the ideal political culture for new media users requires critical awareness, ethical participation, and constructive engagement (Babakhani et al., 2024). This perspective highlights the responsibilities of educational institutions in building a foundational understanding of political norms and values in cyberspace. Given that adolescents frequently encounter political symbols and discourses detached from institutional context, schools must reestablish their role as mediating agents that help students interpret political information within a democratic and ethical framework.

International research further illuminates the political influence of media systems. Vodyanov's work on the Arab Spring demonstrates how media ecosystems—both traditional and digital—shape political processes, mobilize collective identities, and facilitate transformative social movements (Vodyanov, 2023). These findings underscore the ability of media environments to accelerate political change, particularly among youth. Similarly, Theocharis demonstrates that platform affordances significantly reshape political participation by enabling micro-level engagement, connective action, and non-traditional forms of activism (Theocharis et al., 2023). As adolescents engage in political expression through likes, shares, memes, and hashtags, their political identities evolve through interactive and participatory processes rather than hierarchical or instruction-based systems.

Iran-specific research also shows the dual nature of social media in shaping political activism. Rahimi explains how social media offers both opportunities and constraints for political activism in Iran, providing channels for expression while simultaneously exposing citizens to state surveillance and regulatory pressures (Rahimi, 2023). Complementing this view, Rahbarqazi found that social media significantly influences electoral participation and political action among Iranian citizens, functioning as a key determinant of political motivation and mobilization (Rahbarqazi & Nourbakhsh, 2023). These local findings demonstrate that the political role of cyberspace in Iran is neither passive nor peripheral; rather, it is a central component of political socialization, particularly among digitally active adolescents.

Global insights on misinformation and political manipulation further complicate the landscape. Melchior's systematic review shows that motivations for sharing fake

news include social identity, emotional gratification, and ideological commitment (Melchior & Oliveira, 2023). Adolescents, who frequently navigate online spaces without critical oversight, may inadvertently engage with or propagate misinformation, thus reinforcing distorted political perceptions. Furthermore, Lin's analysis of political-business relations underscores the importance of transparent political structures, which adolescents must learn to evaluate critically as part of their civic development (Lin, 2023). The complexities of political ecosystems require that young citizens develop the capacity to differentiate between credible and non-credible political sources.

Political awareness is also shaped by counter-narratives and online activism. Khan's work on counter-narratives demonstrates how social media enables alternative political voices to reshape public discourse and influence youth political awareness (Khan et al., 2023). Keith similarly argues that social media has fundamentally altered patterns of political activism, making youth political engagement more individualized, expressive, and decentralized (Keith, 2023). These phenomena increase the need for structured guidance within educational environments, as students' political identities become increasingly influenced by peer groups, influencers, and algorithmically curated content rather than formal civic education.

Taken together, these scholarly contributions reveal a recurring theme: cyberspace plays a critical and multi-layered role in shaping the political socialization of adolescents. Yet, despite this profound influence, school administrators—who are traditionally responsible for fostering civic education—often lack the training or institutional frameworks needed to guide students effectively in digital political environments. As adolescents increasingly rely on cyberspace for political information, opinion formation, and participatory experiences, understanding the relationship between their digital engagement and political development becomes an urgent educational priority.

Accordingly, the aim of this study is to explain the impact of cyberspace on the political socialization process of upper-secondary students and to analyze the role of educational administrators in guiding this process.

2. Methods and Materials

The present study is an applied research project in terms of its objective, as its results can be directly used by educational administrators and policymakers. In terms of

nature and method, this study falls within the quantitative paradigm and uses a survey method for data collection. This method enables the researcher to examine the views, attitudes, and behaviors of a large sample of the statistical population within a specific time frame and to analyze the relationships between variables quantitatively.

The statistical population of this research consists of two groups. The first group includes all male and female upper-secondary students (grades 10 to 12) in the nineteen educational districts of Tehran during the 2024–2025 academic year, totaling approximately 250,000 individuals. The second group includes all upper-secondary school administrators in Tehran, numbering around 800 individuals. Given the size of the statistical population, a multistage stratified random sampling method was used. In the first stage, Tehran was divided into five zones: north, south, east, west, and central. Then, from each zone, two districts were randomly selected, and from each district, several schools (public and private, boys' and girls' schools) were randomly selected. Finally, from the selected schools, the final sample of students and administrators was chosen through simple random sampling. Using Cochran's formula with a 95% confidence level and a 5% sampling error, the sample size was estimated at 384 students and 260 administrators. To ensure greater accuracy and anticipate potential attrition, 400 questionnaires were distributed among students and 280 among administrators.

The main data collection instruments were two separate researcher-made questionnaires for students and administrators, developed based on theoretical foundations and prior research. The student questionnaire consisted of four sections: demographic information, assessment of the extent and type of cyberspace use, assessment of political socialization dimensions (including 15 items for political knowledge, 15 items for political attitude, and 10 items for political participation), and assessment of the perceived role of administrators from the students' perspective. The administrator questionnaire consisted of three sections: demographic and professional information, assessment of administrators' views on the impact of cyberspace, and assessment of their actual and ideal performance in guiding this process. All items were designed using a five-point Likert scale (from strongly disagree = 1 to strongly agree = 5).

To determine the validity of the questionnaires, content validity was used. For this purpose, the questionnaires were reviewed by 10 distinguished professors in the fields of educational sciences, communication sciences, and political

science, and after receiving their corrective feedback, the necessary revisions were made. To assess the reliability of the instruments, a pilot study was conducted with 30 students and 20 administrators. Cronbach's alpha coefficient for the entire student questionnaire was 0.89 and for the administrator questionnaire was 0.91, indicating very good reliability.

After data collection, the questionnaire responses were entered into SPSS version 26 and analyzed using descriptive statistics (frequency tables, mean, standard deviation) and

inferential statistics (Pearson correlation test to examine relationships between variables and independent t-test to compare the viewpoints of the two groups).

3. Findings and Results

In this section, the descriptive and inferential findings resulting from data analysis are presented in the form of tables and corresponding explanations.

Table 1

Descriptive Statistics of the Main Research Variables Among Students (N = 380)

Variable	Minimum	Maximum	Mean	Standard Deviation
Extent of Cyberspace Use	1.50	5.00	4.12	0.68
Political Knowledge	1.20	4.80	3.15	0.85
Political Attitude	1.40	4.60	3.41	0.79
Political Participation	1.00	4.20	2.89	0.92

As shown in the table above, the mean score for "extent of cyberspace use" among students (4.12) is very high and close to the "high" option on the Likert scale, which indicates extensive and everyday use of cyberspace by students. In contrast, the means of the three dimensions of political socialization fall at an average level. The highest

mean corresponds to "political attitude" (3.41), and the lowest to "political participation" (2.89). This may indicate that students in cyberspace tend to engage more in forming political attitudes and sentiments rather than engaging in actual political action and participation.

Table 2

Pearson Correlation Matrix Between Extent of Cyberspace Use and Dimensions of Political Socialization

Variables	Political Knowledge	Political Attitude	Political Participation
Extent of Cyberspace Use	0.421	0.388	0.312
Significance Level (Sig.)	0.000	0.000	0.000

The results of the Pearson correlation test in the table above indicate a positive and significant relationship between the extent of cyberspace use and all three dimensions of political socialization (significance level < 0.01 for all relationships). The strength of this relationship is moderate and strongest for "political knowledge" ($r = 0.421$). This finding shows that the more time students spend

in cyberspace and use it as a source of information, the higher their political knowledge, attitudes, and political participation tendencies become. This positive association further underscores the importance of guiding this process so that such increases occur in a constructive and appropriate direction.

Figure 1

Significance Model of the Study's Sub-Hypotheses in the Standardized Estimation Mode

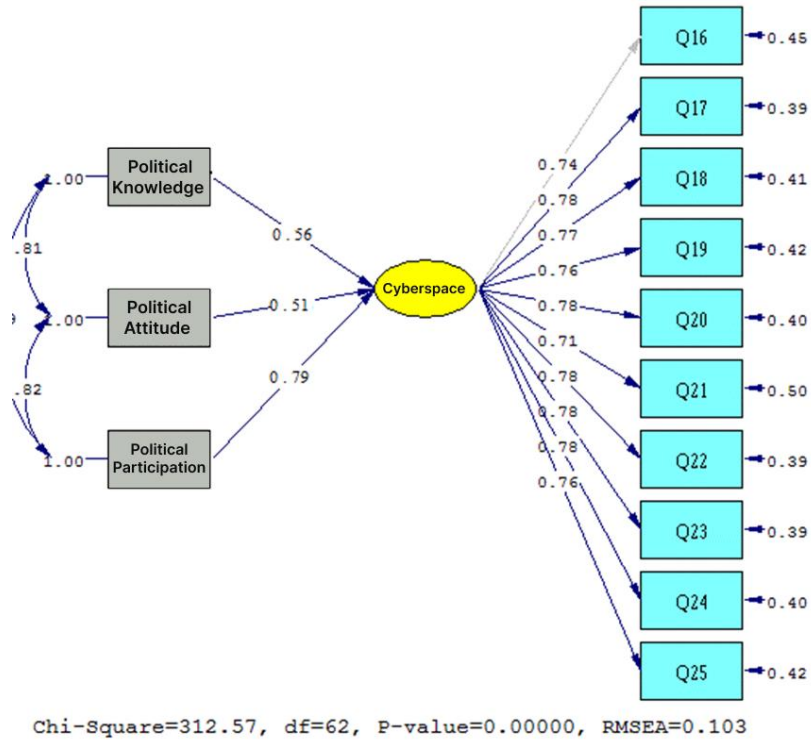
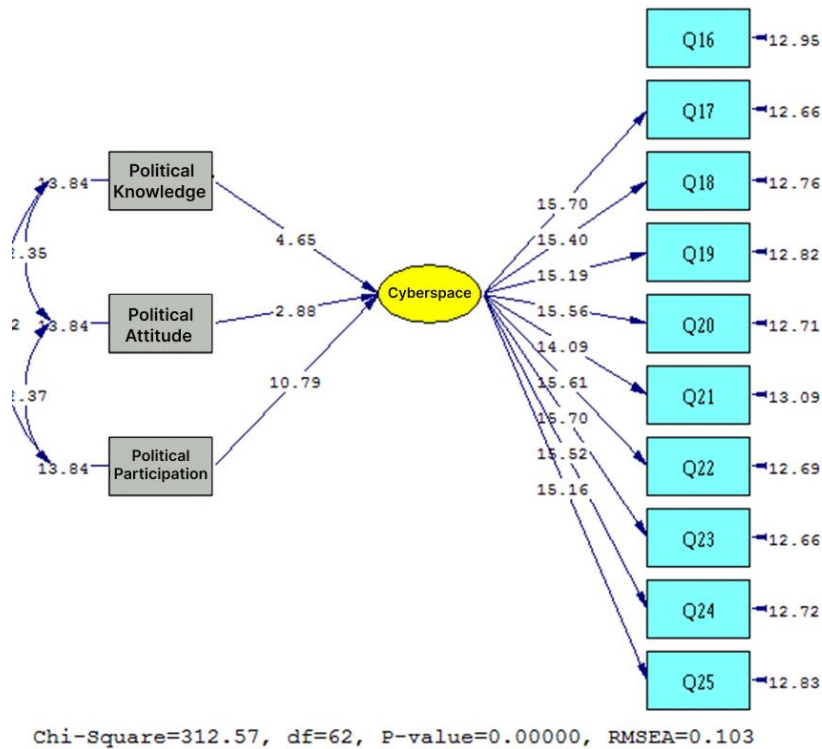


Figure 2

Significance Model of the Study's Sub-Hypotheses in the Significance Coefficient Mode



Based on all indicators, it can be concluded that the model of sub-hypotheses has a good fit.

- The obtained IFI (Incremental Fit Index) value is 0.98, which indicates desirable model fit.
- The NNFI (Non-Normed Fit Index), which is among comparative fit indices, should exceed 0.90; the value for the main research model is 0.96, indicating good fit.
- The NFI (Normed Fit Index, Bentler–Bonett) value is 0.96; given that the standard acceptable threshold is 0.90, this index also confirms desirable fit.
- The AGFI (Adjusted Goodness of Fit Index), adjusted for degrees of freedom, has an acceptable threshold of 0.80; the value obtained for the model is 0.96, indicating good fit.

- The GFI (Goodness of Fit Index), which shows how well the model fits compared to the null model, must be above 0.90; the obtained value of 0.97 indicates excellent fit.
- The RMSEA (Root Mean Square Error of Approximation) value obtained is 0.060, which is desirable given that values below 0.08 are acceptable.
- The SRMR (Standardized Root Mean Square Residual), which should be below 0.05 for optimal fit, is 0.039 for the model, indicating desirable fit.
- The CMIN/DF ratio should be less than 3 for adequate model fit; the obtained value is 1.708, reflecting good model fit.

Therefore, based on all indicators, it can be concluded that the main hypothesis model has a desirable fit.

Table 3

Results of Structural Equation Modeling: Research Hypotheses

Independent Variable	Dependent Variable	Standardized Coefficient	T-value	Test Result
Political Knowledge	Extent of Cyberspace Use	0.56	4.65	Reject H0
Political Attitude	Extent of Cyberspace Use	0.51	2.88	Reject H0
Political Participation	Extent of Cyberspace Use	0.79	10.79	Reject H0

Hypothesis 1: Political knowledge has a significant effect on the extent of cyberspace use among students.

Given that the T-value between political knowledge and the extent of cyberspace use among students is 4.65, which is greater than 1.96, political knowledge has a significant effect on the extent of cyberspace use among students. Additionally, because the correlation coefficient (standardized coefficient) between the two variables is 0.56, it can be concluded that political knowledge has a direct, positive, and significant effect on the extent of cyberspace use.

Hypothesis 2: Political attitude has a significant effect on the extent of cyberspace use among students.

Given that the T-value between political attitude and the extent of cyberspace use among students is 2.88, which is greater than 1.96, political attitude has a significant effect on the extent of cyberspace use among students. Additionally, because the correlation coefficient (standardized coefficient) between the two variables is 0.51, it can be concluded that political attitude has a direct, positive, and significant effect on the extent of cyberspace use.

Hypothesis 3: Political participation has a significant effect on the extent of cyberspace use among students.

Given that the T-value between political participation and the extent of cyberspace use among students is 10.79, which is greater than 1.96, political participation has a significant effect on the extent of cyberspace use among students. Additionally, because the correlation coefficient (standardized coefficient) between the two variables is 0.79, it can be concluded that political participation has a direct, positive, and significant effect on the extent of cyberspace use.

4. Discussion and Conclusion

The findings of this study demonstrate that cyberspace has a significant and direct influence on all three dimensions of political socialization among upper-secondary students—political knowledge, political attitudes, and political participation. The statistical results, including strong correlation coefficients and significant T-values in the structural model, highlight that as students spend more time engaging with digital platforms, their exposure to political content increases rapidly, shaping the cognitive, affective, and behavioral aspects of their political identity. This pattern



aligns with prior research that identifies social media as a powerful agent of political learning, particularly for young people who navigate political information in non-hierarchical and highly interactive environments (Vromen et al., 2015). The elevated mean levels of cyberspace usage observed in this study reflect a broader global trend in which youth develop political competencies predominantly through digital interaction rather than through traditional educational institutions or familial structures.

The results further indicate that the strongest relationship exists between cyberspace use and political knowledge, suggesting that online environments function as major informational repositories for students. This finding is consistent with studies showing that digital platforms provide unprecedented access to diverse political sources, real-time updates, and multimodal content that facilitate cognitive learning (Theocharis et al., 2023). Moreover, the interactive nature of social media, including comment sections, microblogs, and discussion forums, exposes students to both explicit political information and subtle political cues embedded in everyday online communication. Similar to the conclusions drawn by Rahbarqazi, who emphasized the role of social media in shaping Iranian citizens' electoral awareness and political action (Rahbarqazi & Nourbakhsh, 2023), this study shows that students acquire political knowledge not only through deliberate search for information but also through incidental exposure as they navigate digital platforms for entertainment, communication, and social engagement.

Another significant finding is the strong association between cyberspace use and political attitudes. This suggests that digital environments do not merely provide information; they also shape how students perceive political actors, events, and institutions. Online political content is frequently packaged in emotional and persuasive formats that exert substantial influence on adolescents, who may lack the cognitive maturity to filter biased or misleading content. This pattern is echoed in research highlighting how social media sentiment affects user perceptions and decision-making processes (Cao, 2024). The emotional intensification facilitated by digital platforms—through algorithmically selected posts, viral political memes, influencer commentary, and peer-shared narratives—contributes to the formation of early political attitudes among young users. Studies such as those by Khan emphasize that social media fosters counter-narratives and alternative discourses that challenge traditional political messaging, thereby shaping youth awareness and ideological

orientation in novel ways (Khan et al., 2023). The findings of the present study support this argument by illustrating that political attitudes among students correlate strongly with the extent of their exposure to digital content.

Political participation represents the third dimension significantly predicted by cyberspace use in this research. Although students reported lower levels of actual participation compared to attitudes and knowledge, the statistical results show that cyberspace exposure has a powerful positive effect on their willingness to engage in political activities. These findings mirror the conclusions of Keith, who found that social media transforms political activism by enabling low-threshold participation, including liking posts, sharing political content, signing petitions, and engaging in online advocacy (Keith, 2023). The concept of connective action, described by Vromen, argues that youth engage politically through personalized and digitally mediated networks rather than through formal organizations (Vromen et al., 2015). The results of this study reinforce that pattern: students may not participate in traditional civic activities such as school councils or community meetings, but they increasingly express their political identities through digital forms of engagement. This aligns with global trends showing that online participation can serve as a precursor to offline political involvement, as digitally mobilized youth gain confidence, awareness, and interest in political affairs (Kenesov, 2024).

In examining the Iranian context, the findings resonate strongly with studies documenting the transformative political role of cyberspace in Iran. Mahboob's analysis of the November 2019 protests illustrates that social media platforms facilitated rapid dissemination of political grievances among youth, enabling them to organize and communicate outside traditional structures (Mahboob et al., 2025). Rahimi further explains that despite state limitations, digital platforms provide unique opportunities for civic expression and activism among Iranian youth (Rahimi, 2023). The present study's demonstration of a strong positive effect of cyberspace on political participation among students adds empirical support to these observations, indicating that even under restrictive informational environments, students actively negotiate their political identities through virtual networks. Furthermore, Azadi's research on electoral behavior underscores the importance of online political content in shaping participation in formal political processes among Iranian citizens (Azadi et al., 2025). The consistency of these



findings with the present study highlights the depth of cyberspace's influence on political socialization in Iran.

The findings also have theoretical significance regarding the role of educational institutions. Despite their traditional function as primary agents of political socialization, schools appear increasingly marginalized in shaping political values and knowledge. Ribble's work shows that without structured digital citizenship education, students lack guidance needed to navigate online political environments responsibly (Ribble, 2015). Yet the results of this study reveal that although students attribute a role to school administrators in helping them interpret digital political content, administrators themselves often exhibit passive or limited engagement in this area. This gap creates a vacuum that online platforms readily fill, positioning cyberspace as the dominant influential force. Babakhani's analysis of political culture for new media users suggests that without institutional guidance, students may internalize selective, extreme, or inaccurate political narratives that circulate online (Babakhani et al., 2024). The present findings therefore highlight a mismatch between students' digital political experiences and the preparedness of educational leaders to address them.

Another dimension illuminated by the findings is the global nature of politicization in digital environments. Studies of political mobilization in other regions, including Nepal (Kharel & Bhakta, 2024), Central Asia (Kenesov, 2024), and Arab countries (Vodyanov, 2023), show that youth political engagement through social media follows similar patterns: early exposure to political content, emotional mobilization, decentralized activism, and rapid diffusion of political narratives. This reinforces the argument that digital political socialization is not culturally isolated but part of a global shift in civic behavior. Even research not directly focused on political participation, such as Lin's work on political-business relations (Lin, 2023) or Cerf's study on digital intermediation in public policy (Cerf et al., 2024), emphasizes the growing interdependence between technological ecosystems and public decision-making processes. The convergence of these findings with the results of this study demonstrates that cyberspace has become a structurally embedded dimension of civic and political life.

The findings also align with research on misinformation and political manipulation. Melchior's systematic review shows that adolescents may be especially vulnerable to spreading or believing fake news due to emotional impulsivity and social pressures (Melchior & Oliveira, 2023). This resonates with the observed gap between

students' extensive online exposure and their moderate levels of political participation. The strong correlation found between cyberspace use and political attitudes suggests that students' affective responses to political content may be shaped before they develop the skills needed for critical evaluation. Theocharis's framework further supports this interpretation by demonstrating that platform affordances amplify the visibility of emotionally charged content, thereby influencing political judgment (Theocharis et al., 2023). As such, the results of this study provide empirical evidence that political attitudes among adolescents are partially shaped through mechanisms identified in global research on digital misinformation and emotional persuasion.

Several studies on social media affordances also contextualize the results of this research. Hu's analysis of how changing social media affordances reconfigure marketing and communication patterns (Hu, 2025) is directly applicable to political content, which often uses the same techniques to capture attention and influence user behavior. Similarly, Yin's research on digital branding illustrates how online visibility constructs personal value and public identity (Yin, 2025), a phenomenon that parallels the development of political identities among adolescents. As students engage with influencers, activists, and content creators, they encounter political signals embedded in lifestyle content, entertainment media, and fandom spaces. This blending of political and non-political content explains the moderate yet significant relationships identified in this study between cyberspace use and the various dimensions of political socialization.

Taken collectively, these supporting studies reinforce the interpretation of the findings: cyberspace has become a dominant and multidimensional force shaping students' political learning. Whether through informational mechanisms, emotional cues, peer influence, connective action, or exposure to political marketing, students internalize political knowledge, attitudes, and behavioral tendencies in digital spaces long before schools intervene. The consistency of the results with global, regional, and Iranian research not only validates the empirical findings but also highlights the urgency of developing educational strategies that explicitly address digital political life.

The findings also highlight a critical concern: despite the significant impact of cyberspace on students, school administrators demonstrate limited engagement in guiding students' political socialization in digital contexts. This disconnect is consistent with Ribble's arguments that

educators require structured training in digital citizenship to effectively address online political behavior (Ribble, 2015). Without such training, administrators may be ill-equipped to recognize emerging political risks, such as exposure to misinformation, emotional manipulation, online radicalization, or polarized political discourse. As digital political ecosystems continue to expand, the role of educational leadership becomes increasingly essential to ensure that students develop critical, ethical, and responsible political competencies online. The results of this study therefore reveal an urgent need for systemic change in educational policy and training programs.

This study is limited by its reliance on self-reported data, which may be affected by social desirability bias and individual misperceptions of online political activity. The sample, although large and representative of Tehran's upper-secondary students, does not include adolescents from rural areas or smaller towns, limiting the generalizability of the findings to broader national contexts. Additionally, the cross-sectional design prevents the identification of long-term developmental patterns in political socialization, and the study does not include qualitative data that could provide deeper insight into students' motivations, interpretations, and emotional responses to political content encountered online.

Future studies could employ longitudinal research designs to track changes in political socialization across different developmental stages and explore how specific online experiences shape long-term political engagement. Qualitative methods such as interviews or digital ethnography may provide richer insights into how adolescents interpret political content and interact within online political communities. Comparative studies across cities, cultures, and educational systems would help identify structural differences in digital political socialization. Finally, future research could examine intervention models—such as digital citizenship curricula—to assess their effectiveness in enhancing adolescents' political competencies in cyberspace.

Schools should integrate structured digital citizenship education into the curriculum, focusing on critical political literacy, ethical online behavior, and responsible participation. Administrators and teachers should receive targeted training to better understand digital political ecosystems and guide students in navigating them. Educational policymakers should develop frameworks that support collaborative engagement between schools, families, and community organizations to reinforce healthy

political socialization and equip students with the skills needed for active, informed, and responsible civic life in the digital age.

Authors' Contributions

Authors equally contributed to this article.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

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All procedures performed in studies involving human participants were under the ethical standards of the institutional and, or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

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