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Natalia Walter

Adam Mickiewicz University in Poznan, Poland

e-mail: natalia.walter@amu.edu.pl

ORCID: <https://orcid.org/0000-0002-2347-9312>

Agnieszka Iwanicka

Adam Mickiewicz University in Poznan, Poland

e-mail: iwanicka@amu.edu.pl

ORCID: <https://orcid.org/0000-0003-1176-6725>

Girls and Online Civic Engagement: Why Are They Less Likely to Engage in Political Discussion and Argumentation?

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Abstract

The text summarizes the results of the second wave of research conducted in Poland as part of the ySKILLS project (Horizon 2020), which explored young people's digital skills and online civic engagement from six European countries. The study aimed to answer research questions about gender differences in digital skills and the forms of civic engagement in which young people participate through digital means. Data were collected through a Quantitative Longitudinal Data Collection method (survey), and the sample consisted of 1,340 Polish students aged 12–17 from twelve primary and secondary schools. The results showed that boys reported higher levels of involvement in online civic engagement than girls, especially in two areas: 1) discussing or commenting on social or partial political issues online and 2) joining or following a political group on social networks. Regarding digital skills, students reported higher levels of proficiency in communication and interaction skills and lower levels in programming skills. Regarding

girls' digital skills, statistically significant differences were noticed in four areas. Boys declared having higher digital skills in technological and operational skills, programming skills, and information navigation and processing skills. It is recommended that schools and policymakers implement measures aimed at reducing gender disparities, for instance, by providing girls with increased chances to acquire programming skills or by highlighting to girls the advantages of engaging in online civic activities.

Keywords: online civic engagement, girls' citizenship activity, online petitions, internet-based protest/campaign, digital citizenship.

Introduction

Civic engagement is a form of societal and youth activism involving individual or collective activities to enhance the well-being of communities or society at large (UNICEF, 2020, p. 6). Such activities have traditionally included voting, attending community events, contacting public officials, participating in protests, signing petitions, and writing articles about one's community. Currently, there is a growing discussion regarding civic engagement in the culture of participation. Barrett and Pachi (2019) have pointed out that while young people's participation in conventional civic activities such as elections and political rallies has declined over the years, there has been an increase in their involvement in online advocacy campaigns initiated by organizations like Amnesty International. According to developmental theory, youth engage in civic life in diverse ways, and the patterns of civic engagement vary from person to person. Their experiences in this context can significantly influence how civic engagement changes over time (Wray-Lake & Shubert, 2019).

Our article presents the findings of a research study conducted among adolescents aged 12–18, focusing on the challenges faced during this period. The period between ages 19–20 is marked by significant developmental changes, making adolescence a complex and demanding stage. Alongside the biological and cognitive transformations that occur during this phase, young people also undergo a transition into the formal operational stage, as described by Piaget (cited in Brzezińska & Trempała, 2003). Moreover, adolescents at this age strongly emphasise their values and exhibit a clear presentation of their own worldview. They acquire essential social competences

and engage in preparations for active participation in a democratic society (Brzezińska, 2014).

In contemporary society, there is an increasing recognition of the importance of children's voices and their involvement in decision-making processes, both for themselves and for the communities in which they reside. Young individuals are now regarded as advocates for their own interests, social activists, evaluators of decisions that directly impact them, and even researchers of their own reality (Cockburn & Cockburn, 2013; Wyness, 2012; Jarosz, 2016). The trend towards greater emphasis on local participation and children's social engagement began to gain traction around the 1990s. This focus on children's participation was ignited by the adoption of the Convention on the Rights of the Child in 1989. Children's social participation is crucial from the perspective of safeguarding their rights and plays a significant role in the broader context of fostering civil society, civic engagement, and local participation (Jarosz, 2016).

Young people tend to favour flexible modes of social participation, such as engaging in non-governmental organization (NGO) projects, social initiatives, and joining social movements. A report commissioned by the Directorate General for Education and Culture of the European Commission (European Commission, 2018) indicates that young people prefer to associate in NGOs and/or organisations dealing with local issues rather than become members of political parties. On average, twice as many respondents participated in activities to improve their local community than in a political party. Disappointment with traditional and institutionalized forms of political participation may lead individuals to express their interest in politics or opinions outside the formal system. The internet provides a vast array of opportunities for political communication, particularly for young people, who are at the forefront of this trend. Online tools, such as internet fora, chat rooms, social media, and blogs, offer a platform for collective interaction around shared interests. As such, they represent a rich source of political and social engagement, which young people quickly recognize and utilize.

The most recent research on this topic, conducted in 2021 as part of the ySKILLS project (Pyżalski et al., 2022), demonstrated an increase in young

people's interest in online civic participation. Among Polish respondents aged 12–17, it was revealed that 28% added or followed a political group on social media, 25% participated in protests or campaigns conducted on the internet at least once, and as many as 42% participated in online discussions or commented on social and political issues at least once. While there were no gender differences in the first two categories, boys were more likely than girls to engage in political discussions or online comments. In this article, we examine this issue in depth by presenting the findings of research from the second wave of a longitudinal survey (Pyżalski et al., 2023) conducted as part of the European ySKILLS project (yskills.eu), which investigates the level of digital skills of European teenagers and how they evolve over time. The two main research questions for this text were: 'What are the digital skills of girls compared to boys?' and 'What forms of civic engagement do young people participate in through digital means?'

Literature review

Although research conducted over the last decade increasingly focuses on young people's civic engagement on the internet (Freelon et al., 2013; Kahne et al., 2015), there is still no unified conceptualization of this type of engagement in cyberspace. It can be agreed that the internet is the primary source of information for young people on topics that interest them and a place that gives them a sense of freedom and openness in expressing their opinions. They also often have access to the traditional media content through internet channels. In this sense, innovative technologies have undoubtedly changed the meaning of civic participation. Unlike one-way, traditional civic engagement, digital engagement assumes multidirectionality and interaction, strongly resonating with young people's expectations (Coleman, 2006). Research also shows that adults' civic engagement is influenced by the experience and behaviours exhibited during adolescence (the higher the political socialisation and civic engagement in adolescence, the higher the engagement in adulthood) (Bachen et al., 2008; Cohen & Chaffee, 2012; Mann et al., 2009). Other notable factors include the role of family, school, peer groups, and the media.

For instance, the internet plays a significant role in facilitating interactions between young citizens and public authorities. New media also serve as an agora for expressing individual opinions on civic and political issues. According to a report by the European Commission (2018), 16% of young Europeans published their views and ideas on websites in 2017. Polish youth engaged at an average level (approx. 13%) compared to other European countries. The highest level of activity, over 20%, was recorded in Iceland, Great Britain, and Sweden, while the lowest level was observed in Finland, Belgium, Austria, and the Czech Republic.

Hence, it is imperative to underscore the significance of information and communication technologies (ICTs) in creating civic space for young people. The use of social media for civic engagement allows young people to bypass adult gatekeepers and reach a wide audience. While youth political involvement is typically confined to youth initiatives, such as poster competitions, digital media gives more significance to young people's views in broader social movements. However, it is crucial to keep in mind that, despite the enabling potential of digital technologies, these same technologies and platforms can constitute significant deterrents or obstacles to civic engagement (UNICEF, 2020).

According to the Polish section of the EU Kids study from 2018 (Tomczyk, 2019), online civic activity is relatively rare among young people. Merely 4.7% of respondents engaged in campaigns or protests or signed online petitions at least once a week or more often, and 11% discussed social or political issues with others online. However, the situation has altered during the pandemic.

Much of the research conducted in this area shows a notable decline in civic engagement among young people, especially regarding voting in parliamentary elections (Blais & Loewen, 2011; Howe, 2010; Mann et al., 2009). Although youth voter turnout has indeed decreased, youth activity can still be observed in other spaces, such as the internet. The internet is primarily a place that provides young people with information on civic topics. According to a study by Blanford, Taylor, and Smith (2016), young people often encounter such information in an unplanned, unintentional manner

while scrolling the internet. The authors suggest that such accidental discovery of latest information often motivates further search, deepening the topic, and civic engagement (Blanford et al., 2016). On the other hand, such information is not entirely random and may be shaped by the algorithmic character of the tools used by young internet users.

The Global Kids Online study (Livingstone et al., 2019) found that between 5 and 21% of teenagers discuss political issues with other users online (the percentage difference varies depending on the country where the study was conducted). In this study, girls were represented by only 5 to 12% (Livingstone et al., 2019). In another qualitative study conducted through focus groups, young people noted that they often find it easier to discuss civic topics with strangers online than with peers at school. A barrier for traditional conversations within a peer group was attributed to lack of opportunity and fear of ridicule and rejection (Blanford et al., 2016).

Research on young American adults (aged 18–24) shows that ten years ago, young women significantly outperformed their male counterparts in both offline and online civic engagement. At that time, 23.8% of women and 18% of men reported participating in volunteer activities, while 13.3% of women and 7.9% of men reported being members of social organisations. Furthermore, 54% of women and 47.2% of men reported voting in elections (Kwashima-Ginsperg & Thomas, 2013). Paradoxically, despite their high levels of engagement when young, women do not maintain the same level of civic participation as they age, as significant gender disparities persist in politically and socially important positions (Kwashima-Ginsperg & Thomas, 2013).

Differences in civic engagement of men and women can also be observed depending on the country where the research was conducted and the prevailing social norms. For example, a study conducted in Indonesia showed that young Muslim women are willing to express their political opinions, mainly through social media, leaving street politics to men (Yue et al., 2019). Correlates also differ depending on the racial and ethnic identities of the young people studied (Bañales et al., 2020; Hope et al., 2019).

According to the latest report, “Teenagers 3.0” (NASK, 2021), Polish youth also rely on online opinions in matters related to civic and social issues. 9.5%

of the respondents rely on information obtained from the internet regarding social and/or political elections (compared to 7.4% for parents). The report “Young people in Central Europe 2020. NDI research project. Research results in Poland,” developed by the Institute of Public Affairs as part of the National Democratic Institute project, indicates that 78% of respondents aged 16–29 regularly or very extensively use Facebook as a source of information on society and politics. In addition, internet portals (such as Onet.pl, Interia.pl, etc.) rank second at 55%, followed by private radio (such as RMF, Tok FM, etc.) at 52%, and private television (such as TVN) at 51%. YouTube video blogs are also an important source in this regard, as indicated by 48% of respondents (Institute of Public Affairs/NDI, 2020).

To fully understand the engagement of young people – especially girls – in civic activity, further research is undoubtedly needed to fully capture the scope of digital engagement, the motivation for such behaviour, while also considering the wide variety of possible online interactions, from commenting on forums and publishing posts and video content on platforms such as TikTok to creating memes and satirical content. In addition, the need to place research data within a broader social and cultural context should be underscored.

Methods

In 2021, 2022, and 2023, as part of the ySKILLS project, we explored how the digital skills of young people from six European countries (Estonia, Finland, Germany, Poland, Portugal, and Italy) change over time. In three waves of research (in Quantitative Longitudinal Data Collection), the same group of teenagers answered questions about their use of digital media every year. Our respondents answered questions about digital access, internet usage, and digital skills. Data collection was approved by relevant ethical bodies in each country, and the consent of children and parents was sought. This paper summarises the results of civic engagement of young people of the second wave of research, conducted in a sample of 1,340 Polish students aged 12–17 from twelve schools (primary and secondary) in the Wielkopolskie

Voivodeship. The data was collected between April 2021 and June 2022. The questionnaires were administered by researchers in schools.

To ensure the representation of students aged 12–18, a multistage sampling approach was employed. The initial stage involved the random selection of schools from a comprehensive list of educational institutions in the Wielkopolskie Voivodeship. The selection process followed a proportional stratified sampling design, whereby strata were defined based on locality size (i.e., large cities, small towns, villages), school type (public and private), and school level (primary and post-primary). The Educational Information System (SIO) served as the sampling frame, providing a list of schools and corresponding student enrolment information. Using the SIO, the number of students was estimated for each type of school. The randomisation of schools was carried out through a systematic sampling procedure, in which the probability of selection was proportionate to the estimated population size (i.e., number of students) within each school.

Subsequently, within each randomly selected school, specific grades were drawn. In primary schools, grades 6 to 8 were included, while in secondary schools, grades 1 to 3 were considered. Overall, the first wave of the research encompassed a total of 12 schools, comprising 7 primary schools (1 private, 5 public; 3 rural, 1 small town, 3 large provincial capital) and 5 secondary schools (2 technical schools, 3 general secondary schools; 1 private, 4 public; 1 urban-rural commune, 4 large city).

The two main research questions for this text were RQ1: “What are the digital skills of girls compared to boys?” RQ2: “What forms of civic engagement do young people participate in through digital means?”

The study used the Youth Digital Skills Indicator (yDSI), a cross-cultural scale that has been rigorously validated. The yDSI assesses digital skills across five dimensions, namely: (1) technical/operational skills; (2) programming; (3) navigation and information processing; (4) communication and interaction; and (5) content creation and production. This scale was specifically developed to capture both functional aspects, such as ICT literacy, and critical competences, including an understanding of content design and creation (Helsper et al., 2020).

To measure digital skills, a set of twenty-five items was used. The reliability of the scale in the present sample was found to be high, with coefficients of 0.74 for technical and operational skills, 0.80 for information processing, 0.77 for communication and interaction, and 0.79 for content creation and production. For a comprehensive list of the scale items, see Helsper et al. (2020).

Drawing on existing research and literature analysis (Helsper & van Deursen, 2018; van Deursen et al., 2016), a conceptual model has been developed to create metrics that align with the four dimensions of digital skills. These dimensions reflect functional and critical aspects and are as follows:

- Technical and operational skills: This dimension refers to the ability to manage and operate ICT, including technical capabilities of devices, platforms, and applications. It involves knowing how to use buttons, manage settings, and programme.
- Navigation and Information Processing Skills: This dimension involves the ability to search for and select digital sources of information critically. It also includes the ability to critically evaluate information.
- Communication and interaction skills: This dimension refers to the ability to use various digital media and technological features to interact with others, build networks, and critically assess the impact of communication and interpersonal interactions.
- Content creation and production skills: This dimension involves the ability to create high-quality digital content, understand how it is produced and published, and how it generates impact.

The questionnaire used in this study comprised twenty-five items corresponding to the four dimensions of digital skills according to the conceptual model of digital skills. Programming was included as a standalone item, despite not being part of the four dimensions, because it is a critical skill according to the literature and interventions. Here are some examples of the items included in categories: “I know how to adjust privacy settings,” “I know how to disable location settings on mobile devices,” “I know how to use private browsing,” “I know how to use a programming language (e.g.

XML, Python),” “I know how to choose the best keywords for searching on the Internet.”

Results

To assess students’ digital skills, we analysed the proportion of skills at a high level, computed from at least three items, across the four dimensions of digital skills outlined in our conceptual model. Our findings indicate that:

1. Technological and operational skills: 47.05% of Polish students reported a high level of proficiency in this area.
2. Programming skills: 5% of students reported high proficiency in programming.
3. Information navigation and processing skills: 31% of students reported a high level of proficiency in this area.
4. Communication and interaction skills: 52% of the students reported a high level of proficiency in this area.
5. Content creation and production skills: 32% of the students reported a high level of proficiency in this area.
6. All digital skills: Overall, 30.5% of the students reported a high level of proficiency in all four dimensions of digital skills.

Our analysis suggests that while students generally reported high levels of proficiency in technological and operational and communication and interaction skills, there is room for improvement in information navigation and processing and content creation and production skills. Furthermore, the low proportion of students reporting high levels of proficiency in programming skills highlights a potential area for targeted interventions to improve digital skills among students.

Regarding girls’ digital skills, statistically significant differences were noticed in four areas. Boys declared having higher digital skills in technological and operational skills (boys: 62%, girls: 48%), programming skills (boys: 17%, girls: 9,5%), and information navigation and processing skills (boys: 47%, girls: 30,5%). There were also noticeable differences in the general category of “digital skills” in favour of boys. Detailed data are presented in Table 1.

Table 1. *t*-test results comparing girls and boys on digital skills: technological and operational skills, programming skills, information navigation and processing skills, communication and interaction skills, content creation and production skills, and all digital skills: proportion of skills at a high level for all dimensions

Group statistics								
	Gender	N	Mean	SD	SE	t	df	p
Technological and operational skills: Proportion of skills at a high level, computed from at least three items*	boy	575	0.62	1.084	0.014	6.92	1110	< 0.001
	girl	537	0.48	1.066	0.013			
Programming skills: Programming at a high level*	boy	575	0.17	1.416	0.016	3.68	1107	< 0.001
	girl	534	0.096	1.377	0.013			
Information Navigation and Processing Skills: Proportion of skills at a high level, computed from at least three items*	boy	578	0.47	1.375	0.014	8.53	1113	< 0.001
	girl	537	0.31	1.232	0.013			
Communication and interaction skills: Proportion of skills at a high level, computed from at least three items.	boy	574	0.61	0.932	0.014	0.30	1112	0.032
	girl	540	0.60	0.892	0.013			
Content creation and production skills: Proportion of skills at a high level, computed from at least three items.	boy	573	0.42	1.231	0.015	3.01	1106	0.042
	girl	535	0.36	1.081	0.015			
Digital skills: proportion of skills at a high level for all dimensions*	boy	558	0.4252	0.235	0.01	5.86	1082	< 0.001
	girl	526	0.3461	0.207	0.009			

Online civic engagement was measured with five items (“Signed an online petition,” “Shared news or music or videos with social or political content with people in your social networks (e.g., Facebook, Twitter),” “Discussed or commented on social or political issues on the internet,” “Participated in an internet-based protest or campaign,” “Joined or followed a political group on social networks (e.g., Facebook, Twitter)”) answered on a 4-point Likert-type scale (1 = never, 4 = more than twice).

Almost 75% of the respondents engaged in at least one activity once, computed from at least three items. It was 73.7% of boys, 74% of girls and 94% of the other sex. As can be seen in Table 2, there are statistically significant

differences between girls and boys. Boys declared civic engagement more often than girls.

Table 2. *t*-test results comparing girls and boys on online civic engagement (Mean value computed at least three items)

	Group statistics							
	Gender	N	Mean	SD	SE	t	df	p
Civic Engagement: Mean value computed from at least three items*	boy	524	1.97	0.869	0.038	0.85	1017	< 0.001
	girl	495	1.83	0.776	0.035			

We conducted a closer examination of the individual items in our questionnaire in relation to gender. Our analysis revealed statistically significant differences in two areas: 1) discussing or commenting on social or political issues online and 2) joining or following a political group on social networks. Specifically, boys reported higher levels of involvement than girls in both areas. However, we found no significant gender differences in the remaining areas, which included signing online petitions, sharing news, music, or videos with social or political content on social networks, and participating in internet-based protests or campaigns. These results are consistent with those obtained in other countries, including Finland.

Table 3. *t*-test results comparing girls and boys on online civic engagement

	Group statistics							
	Gender	N	Mean	SD	SE	t	df	p
[Signed an online petition] Have you done any of the following in the PAST YEAR ONLINE (e.g., on Facebook or Twitter, YouTube, other websites)?	boy	485	1.80	1.084	0.049	0.46	934	0.685
	girl	451	1.77	1.066	0.050			
[Shared news or music, or videos with social or political content with people in your social networks (e.g., Facebook, Twitter)]	boy	498	2.47	1.416	0.063	0.15	942.126	0.021
	girl	451	2.45	1.377	0.065			
[Discussed or commented on social or political issues on the internet]*	boy	503	2.30	1.375	0.061	4.95	966	< 0.001
	girl	465	1.88	1.232	0.057			

	Group statistics							
	Gender	N	Mean	SD	SE	t	df	p
[Participated in an internet-based protest or campaign]	boy	507	1.46	0.932	0.041	0.098	974	0.599
	girl	469	1.45	0.892	0.041			
[Joined or followed a political group on social networks (e.g., Facebook, Twitter)]*	boy	505	1.85	1.231	0.055	3.25	981	< 0.001
	girl	478	1.61	1.081	0.049			

Discussion and recommendation

The results of this study suggest that there is a need for targeted interventions to improve students' digital skills, particularly in the areas of information navigation and processing and content creation and production. Furthermore, the low proportion of students reporting high levels of programming proficiency highlights the need for additional education measures in this area. Schools, policymakers, and parents should consider offering more opportunities for students to develop and master those skills.

The study also highlights gender differences in self-assessed digital skills and online civic engagement. Boys reported higher levels of proficiency in various areas of digital skills, including technological and operational skills, programming skills, and information navigation and processing skills, as well as higher levels of civic engagement in the areas of discussing or commenting on social or political issues online and joining or following a political group on social networks.

It is crucial to emphasize that the overall results of studies indicate that boys tend to possess greater digital skills than girls, particularly when studies use self-reported questionnaires like the one used in our study. However, one should remember there that such methodology may also mirror confidence levels than actual abilities or knowledge. In contrast, performance tests, which are more objective than surveys, show mixed results with respect to gender differences. The studies' findings suggest that boys and girls may excel in different areas, which may be influenced by gendered cultural expectations and individual interests (Haddon et al., 2020).

Encouraging the social and civic engagement development of young people is extremely important. Empirical research indicates a correlation between adolescents' prosocial behaviour and psychological well-being (Hui et al., 2020). Prosocial behaviour is defined as intentional actions aimed at benefitting others and is a fundamental behaviour for collective efforts to cope with challenging circumstances (Crone & Achterberg, 2021). The COVID-19 pandemic provides an example of this, as research has demonstrated that prosocial individuals are less likely to put others at risk and are more likely to follow public health guidelines such as physical distancing, staying home when feeling ill, and wearing face masks (Campos-Mercade et al., 2021). Additionally, social engagement may serve as a protective factor against engaging in risky behaviours and improve resilience (Walter, 2022).

Active participation in political life is a crucial element in promoting social welfare. Our study findings suggest that girls are less likely than boys to engage in political activities, which could potentially influence their future life and civic engagement as adults. Women remain significantly under-represented in all aspects of political life, and progress toward achieving gender balance in political decision-making is slow in most Member States. As of March 2022, women represented only 33% of the members of the EU's lower house of national parliaments (European Institute for Gender Equality, 2022).

In the European Parliament, there are 403 men and 255 women. However, there is a country, Cyprus, where is not represented by any women, and in Romania, there are only five women out of twenty-eight men. Poland, on the other hand, is represented by 34 men and 18 women (European Institute for Gender Equality, 2022). The situation is even more concerning in the Polish parliament, where women account for only 19% of ministers and deputy ministers with the rank of at least undersecretary of state, with only three women serving as ministers. In the current term of the Sejm, female deputies make up 28.7% of the total, while in the Senate, they account for 24%. Electoral lists are required to include a minimum of 35% representation from both sexes (Druciarek et al., 2019).

Of course, women's political careers are influenced by several other factors, with education and qualifications playing a significant role. Access to

high-quality education equips women with the knowledge, skills, and critical thinking abilities necessary for leadership positions. Furthermore, a higher level of education often translates into greater opportunities for political advancement. Therefore, it is crucial that educational institutions and policymakers consider interventions that address gender disparities. This may include providing girls with increased opportunities to acquire programming skills and promoting the advantages of online civic engagement.

Numerous studies, including our own, have emphasized the importance of incorporating effective teaching methods in educational settings. Specifically, there is a need to implement instructional strategies that develop argumentation skills in both male and female students. Examples of such strategies include the Oxford debate and project-based learning. Additionally, it is essential to foster students' interest in politics and their sense of responsibility towards the broader community. To this end, engaging students in local government activities within their schools can be valuable. Furthermore, to enhance students' digital competencies, it is imperative to integrate technology into the learning process. One promising methodology is the STEAM approach, which aims to stimulate students' engagement by catering to diverse interests and aptitudes, regardless of gender.

In determining women's political and social activity, factors beyond education and the development of digital competences come into play, for example:

1. Gender-sensitive policies: encompass various measures, such as salary quotas, affirmative action, and gender mainstreaming strategies. These initiatives aim to rectify gender disparities in political representation and level the playing field for women.
2. Political experience and skill development: women's careers are influenced by their involvement in local governments, social activities, and civil society organizations. By participating in these arenas, women gain valuable experience and cultivate essential skills such as public speaking, negotiation, coalition building, and policy analysis.
3. Gender-sensitive media and public discourse: positive and truthful media coverage that focuses on women's accomplishments, qualifications,

and competences plays a pivotal role in shaping their public image and garnering support for their political endeavors.

4. Social attitudes and cultural norms pertaining to gender roles: challenging entrenched gender stereotypes and fostering a culture that recognizes and encourages women's leadership are crucial for dismantling barriers and promoting their participation in political spheres.

In light of our research findings, it becomes evident that digital skills constitute a key determinant of success in contemporary society. Alongside education and digital competences, the state assumes a crucial responsibility in facilitating such success. By actively promoting the socio-political engagement of women, fostering gender equality, and ensuring equitable access to essential resources, the state plays an instrumental role in nurturing the requisite skill development demanded by the present era.

Conclusions

In conclusion, this study highlights the need for targeted interventions to improve students' digital skills and online civic engagement, particularly for girls who are underrepresented in the political and digital spheres. Schools and policymakers should consider offering more opportunities for students to develop those skills, such as STEAM programs, argumentative skill development workshops, and encouraging student council participation. Additionally, promoting the benefits of online civic engagement to girls and providing them with opportunities to gain experience programming skills could help narrow the gender gap in digital and political participation. Ultimately, enhancing students' digital skills and civic engagement can promote their success in today's society, enhance their psychological well-being, and benefit society.

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