
The examination of voter opinions on the implementation and use of i-voting: the case of Poland

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Abstract: Although it never prevailed, i-voting has been present in the public discourse in Poland for over ten years. Despite declarations of some political parties to implement innovative voting methods to facilitate the election process for eligible citizens, no legal basis has been created for i-voting as yet. In 2020, the Covid-19 pandemic exposed weaknesses of a limited range of voting methods available both in ordinary and extraordinary situations. The paper analyses and explains the support for additional election methods among voters in Poland. The analysis of demographic features and political preferences highlights differences in opinions on i-voting as a remote voting method. The research is based on a statistical analysis of data from a survey conducted in Poland between March and May 2018.

Keywords: alternative voting methods; elections; electronic voting; i-voting; internet voting; opinion polls; Poland; Polish voters; political preferences; remote voting.

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1 Introduction

Apart from social, economic and political challenges, the Covid-19 pandemic also exposed weaknesses of having limited solutions in the case of elections in extraordinary situations. In the first months of 2020, due to a very rapid spread of coronavirus, most of the national governments decided to postpone their parliamentary, presidential, local elections and referendums scheduled in spring and summer 2020 (about 50 countries and territories decided to postpone while almost twenty other held elections as reported by International Institute for Democracy and Electoral Assistance, 2020). Despite very limited voting options available, the ruling party in Poland decided to proceed with the presidential election during the peak of the pandemic. The pandemic revealed the lack of or poor preparation to hold elections in extraordinary circumstances. To make the election possible, the government tried to reform the electoral law and introduce all-postal voting. Due to the failure to meet requirements (“the postal service should effectively operate during the pandemic, ballots should be delivered to voters abroad, and voters had to trust the postal service in the country and abroad”; Krimmer et al., 2021), the presidential election scheduled on 10th May and expected to use exclusively postal voting was not held (*The resolution...*). Afterwards a hybrid solution was introduced combining polling station voting with postal voting on demand. This opened a discussion on alternative voting methods which could replace or supplement a personal vote in polling stations and enable the electoral management bodies to run safe elections.

In the past several years, we have witnessed a rapid civilisation development promoted by a major information and communication technology advancement in practically every field of life, including the political space. Nevertheless, there are only a

few countries that use electronic voting systems. Some other countries have tested or used these systems aiming to not replace traditional participation in elections but to add a new voting channel (Ladner et al., 2012; Maurer and Barrat, 2015; Morales-Rocha et al. 2008). Although it could be a good alternative for extraordinary circumstances when personal voting is not possible such as pandemic, hurricanes, tornadoes, floods, heavy snowfall, and war. One of the most prominent examples is Estonia where online voting (remote voting over the internet; i-voting) was introduced in 2005. According to the Estonian government, the remote internet voting has been accepted as a voting method by the society. Moreover, it has a potential to improve the electorate's engagement as the accessibility of the internet from remote locations has an impact on the engagement of some types of electors (Goodman et al., 2010, p.35). This has been confirmed by data of the Estonian Election Commission. The growing numbers and proportions of i-votes (votes cast online) have confirmed a great interest and support for i-voting among Estonian voters. Moreover, supporters of e-voting assume that once a new method of participation is added, it makes voting available to a wider range of citizens, including disabled people and people living or working abroad. Positive attitudes towards electronic voting (e-voting, which by definition involves use of electronic channels, in particular voting online) have been growing primarily because of the novelty effect, convenience and potential benefits of the tool (not only for voters, but also for electoral administration or politicians). Many voters prefer i-voting over traditional methods. This group includes the youngest voters in particular (their ability to use electronic technology is the highest). Those positive opinions are due to the fact that Estonian internet voting is more cost efficient (Krimmer et al., 2020). It creates a habit that has been confirmed by the last elections, where 44% of voters used this method. Citizens who vote by internet do not come back to paper voting (Solvak and Vassil, 2017)

The main research problem discussed in the paper concerns attitudes among Poles towards remote voting over the internet (i-voting, voting online). It needs to be emphasised that when the pandemic started, Poland had very limited voting options available (apart from voting in person, the only other option was voting by proxy). Although voting over the internet has been discussed, no i-voting option has ever been offered in Poland.

The first use of an IT system to support the election in Poland dates back to 1993 when the system was used to count votes in the parliamentary election. The internet, however, was employed for the first time in the 2000 presidential election to transfer data from district election commissions to the main election center. Then, IT systems were used on a larger scale (in 10% of constituencies) during the local elections of 2002 (Dlaczego w Polsce wciąż nie głosujemy przez internet?, 2018). As a part of a pilot program, for the first time, encrypted data were sent directly from polling stations to the central database of the National Election Bureau and the electronic signature was used to authenticate the process. Voters could follow results over the internet. Since then, the system has changed several times and played a role of an IT tool supporting Election Committees answerable to the National Election Bureau. It should be mentioned that the 2014 local elections noted certain problems with the IT system which prevented vote counting and regional committees had to count votes manually (Michalak, 2016). The system is based on the storage of voting data, information about candidates (e.g., numbers, names, political affiliations, composition of electoral commissions in constituencies) and many more.

During voting, the system helps to collect information about the turnout and afterwards it examines the arithmetical compliance of data reported and accuracy of results. The platform is used to transfer voting results, revised by election commissions, from constituencies to the State Election Committee. It also enables voters to check results over the internet.

The main objective of the paper is to analyse and explain how demographic features and political preferences differentiate opinions on i-voting as a remote voting method in the context of Polish voter attitudes towards alternative voting methods.

2 I-voting in the opinion of Poles

2.1 Methodology

The analysis is based on a study involving a sample of 1717 Poles surveyed between March and May 2018. It was a quota-based sample taking into account the demographics of the population. In each province, the size of the sample was proportional to the total population and a sex and age structure. Although most of respondents filled out a paper questionnaire, they could also use its electronic version available for internet users. The questionnaire included respondent's particulars and questions referring to their participation in elections, political preferences, use of the internet, as well as electronic voting and electronic administration.

The survey aimed at answering the following research questions:

- Do Polish voters support the introduction of additional voting methods?
- Do demographic features differentiate opinions on internet voting methods?
- Does voters' attitude to e-voting converge with the opinion of the political party they vote for?

In this paper, we present mean results regarding i-voting according to answers given to the following statements:

- 1 I do not want any additional voting methods to be available/introduced (e.g., internet voting, postal voting) in Poland. Voters should vote in polling stations only by casting their ballots into the ballot box.
- 2 Poland should introduce internet voting as an additional form of participation in elections.
- 3 If possible, I would use internet voting in elections.

Answers to the statements were placed on the Likert scale and respondents could choose one of five possible options. Particular options had a specific number of points assigned as follows: 'definitely yes' – 5 points, 'rather yes' – 4 points, 'hard to say' – 3 points, 'rather no' – 2 points, 'definitely no' – 1 point. As mentioned above, the data were analysed in the context of demographic and political features.

The analysis is based on the assumption that there is a relationship between demographic features/political preferences and voters' opinions on the possible use of i-voting in elections. The main goal is to determine the degree (and scope) of demographic features and political preferences and their influence on the probable use of

electronic voting (if available) as an election participation method. While answering the above research questions, the authors have assumed that there is a relationship between political variables and preferences and opinions on the use of modern forms of voting. Moreover, demographic features and political preferences are statistically significant predictors of voters' attitudes towards the introduction of i-voting.

Demographic features examined included sex, age, education and domicile. Political preferences were tested by the following question: *If the parliamentary election was held today, who would you vote for....* The respondents could choose the following answers:

- a Sojusz Lewicy Demokratycznej (Democratic Left Alliance)
- b Wolność Janusza Korwin-Mikke (KORWIN)
- c Kukiz '15
- d Nowoczesna (Modern)
- e Partia Razem (Together)
- f Platforma Obywatelska RP (Civic Platform)
- g Polskie Stronnictwo Ludowe (Polish People's Party)
- h Prawo i Sprawiedliwość (Law and Justice)
- i another party, which...?
- j hard to say
- k I would not vote.

Political parties mentioned in the possible responses included those represented in the Sejm (lower chamber of the Polish parliament) during the period of the research.

The analysis also includes the assessment of i-voting by particular voters' groups in comparison to other methods, as well as general opinions on introducing additional voting methods in Poland. To answer research questions it was necessary to provide statistical analyses of descriptive data together with Kolmogorov-Smirnov tests, χ^2 tests, U Mann-Whitney tests and post-hoc Dunn-Sidak tests.

3 Results

The analysis starts with the examination of the general opinion on introducing alternative voting methods expressed in the following statement: "I do not want any additional voting methods to be available/introduced (e.g., internet voting, postal voting) in Poland. Voters should vote in polling stations only by casting their ballots into the ballot box". The average response rate was relatively low (only 2.24), which means that most of respondents did not agree with the statement (up to 61.34% negative responses) and actually wanted additional voting methods to be available in Poland. It may be related to the fact mentioned earlier that in Poland the range of voting methods has been very limited. It made it difficult or impossible for voters to cast ballots anywhere else but directly in a polling station on the election day.

A more detailed analysis (Table 1) of opinions about different forms of voting available for different groups of voters (for everyone, sick, disabled, elderly, people

staying abroad) shows that the most preferred voting methods are: internet voting (average 4.24) and electronic voting at a polling station (average 4.17). Most respondents indicated i-voting and electronic voting at a polling station as an option for all voters, whereas the lowest number of respondents claimed that such a possibility should be excluded. Although the possibility of such voting for selected groups did not get the highest score, we can say that these two methods were the most favoured. Studies by Germann and Serdült (2017) have also shown that voting online has the potential to make voting more convenient than postal voting (although convenience of i-voting has a very limited impact on turnout). These findings are applicable to elections held in ordinary situations, but we can say that voting via the internet may be an essential method in extraordinary circumstances. It is worth noting that both postal and internet voting are remote voting methods that could ensure social distancing. They were indicated by Krimmer et al. (2021) as one of three possible scenarios in case the government would decide to hold the election amid the Covid-19 threat. The third scenario, namely voting in person, would require special health protection measures.

Table 1 Availability of alternative voting methods for different groups of voters

	<i>Average</i>	<i>There should be such a possibility for everyone</i>	<i>There should be such a possibility only for the sick, disabled and elderly</i>	<i>There should be such a possibility for people staying abroad</i>	<i>There shouldn't be such a possibility</i>	<i>It's hard to say</i>
Electronic voting at the polling station – voting machines	4.17	59.2%	11.54%	2.87%	7.82%	13.73%
Voting via the internet (from computer with internet access)	4.24	62.8%	12.66%	5.96%	6.92%	7.09%
Postal voting	3.19	28.36%	21.21%	11.98%	23.63%	10.07%
Voting by proxy	3.28	15.98%	43.5%	4.33%	21.94%	9.29%
Voting at home – members of the election commission come with a portable ballot box	2.85	10.13%	36.29%	1.18%	34.55%	13.22%

Interestingly, relatively high confidence in i-voting has been confirmed by the rating of the risk of fraud related to voting other than in polling stations. Electronic voting, which is often accused of being technically dubious and unsecured, has a lower average score (3.15) than postal voting which has the highest score (average 3.2). The use of voting machines in polling stations has been considered to be the least prone to electoral fraud (average 2.59) among all voting options presented.

Taking into account the statement Poland should introduce internet voting as an additional form of participation in elections and statement I would use the possibility of internet voting in elections, it is worth noting that the median of the answers is quite high

and similar. It was 3.98 (almost 70% of respondents chose 'definitely yes' or 'rather yes') and 3.92 (69% positive responses), for statement 1 and 2 respectively.

The examining of results against demographic features (Table 2) has proven that answers given by women and men do not show statistically significant differences. For statement 1 medians for both groups have similar values. In the case of statement 2, the difference was at the level of a statistical tendency. The power of all effects noted was rather low. In fact, answers varied only depending on the age of respondents. For statement 1, the lowest results were recorded in the group of 65+. The group showed statistically significant differences from other age groups except 55–64 (about 58% of 65+ respondents gave positive answers to that question, median 3.62). The group differed only from the one with the highest percentage of positive answers, namely the group of 35–44 (nearly 80% positive answers, median 4.23). In the case of statement 2, members of the oldest age group were the least convinced (about 50% of positive answers, median 3.26) and showed statistically significant differences from other groups. As regards statistical significance, other differences between groups were negligible. The only statistically significant differences were noted between groups of 55–63 and 35–44. According to the analyses of the median in particular age groups, we can see that results were inversely proportional to the age of the surveyed from the oldest to the middle age groups. The lowest results regarding all statements were recorded in the oldest group, whereas the highest in 35–44. A slight drop from the lowest median could be found in groups of 25–34 and 18–24.

Answers also varied depending on the education level (because a group of uneducated people consisted of two people only, their answers have been eliminated from analysis). The analysis of the median in particular groups differentiated by education shows that results are proportional to the level of education. This means that the higher the education, the higher the number of positive answers to a given statement. People who agreed with statement 1 included respondents with higher education. The highly educated group shows statistically significant differences from three other groups. The middle education group also shows high results. The group shows statistically significant differences compared with people with primary/junior secondary and vocational education. As regards statement 2, higher education group scores (middle/post-secondary and higher education) have shown statistically significant differences compared with primary/junior secondary and vocational education groups.

The final demographic factor that has been taken into account in the analysis was the domicile. It does not show a simple linear relationship to responses. However, two linear functions can be determined among inhabitants of rural areas and cities with population of 20–100 thou. and inhabitants of cities with population of 100–200 thou. and cities with population of 500 thou. As regards statement 1, the highest results are recorded in the group of inhabitants of cities with populations exceeding 500 thou. This group shows a statistically significant difference compared with other groups, except inhabitants of cities of 20–100 thou. Additionally, a difference is recorded between inhabitants of rural areas, who least agreed with the statement, and inhabitants of cities of 100–200 thou. As regards statement 2, again the highest results are recorded in the group of inhabitants of large cities with population around 500 thou. The group shows a statistical significant comparison with inhabitants of rural areas and cities up to 100 thou. Moreover, inhabitants of rural areas, who had the lowest level of convergence with statement 2, show statistical differences comparing with inhabitants of cities with population of

20–100 thou. and, at the level of a statistical tendency, comparing with inhabitants of cities with population of 200–500 thou.

Table 2 Demographic features and answers to statements

	<i>Poland should introduce internet voting as an additional form of participation in elections</i>		<i>If possible, I would use internet voting during elections</i>	
<i>Sex</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Female	4.00	1.12	3.98	1.25
Male	3.96	1.15	3.86	1.32
	$U = 351553.5$; $Z = -0.75$; $p = 0.452$; $r = 0.02$		$U = 338355.0$; $Z = -1.86$; $p = 0.063$; $r = 0.05$	
<i>Age</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
18–24	4.04b	1.06	4.13b	1.13
25–34	4.08b	1.11	4.05b	1.18
35–44	4.23c	1.02	4.22b	1.05
45–54	4.03b	1.04	4.02b	1.16
55–64	3.88ab	1.22	3.85b	1.35
65+	4.04b	1.06	3.26a	1.54
	$H(5) = 47.93$; $p < 0.001$		$H(5) = 82.53$; $p < 0.001$	
<i>Education</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Primary/ junior secondary	3.00a	1.15	2.48a	1.38
Vocational	3.56a	1.17	3.24a	1.40
Secondary/post-secondary	3.97b	1.10	3.98b	1.23
Higher	4.11c	1.12	4.05b	1.23
	$H(4) = 63.16$; $p < 0.001$		$H(4) = 81.61$; $p < 0.001$	
<i>Domicile</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Rural	3.85a	1.19	3.77aT	1.31
City up to 20 thou.	3.92ab	1.11	3.80ab	1.33
City of 20–100 thou.	4.10abc	1.06	4.09bc	1.20
City of 100–200 thou.	4.18b	0.98	3.98abc	1.20
City of 200–500 thou.	3.96abc	1.18	3.99abcT	1.31
Above 500 thou.	4.15c	1.09	4.10c	1.24
	$H(5) = 23.61$; $p < 0.001$		$H(5) = 26.86$; $p < 0.001$	

M: median; SD: standard deviation; U: Mann-Whitney test result; p: statistical significance; r: effect size; Z: standardised value; H: post-hoc Dunn-Sidak test results.

Regarding political preferences (presented in Table 3), we can say that there is a relationship between such preferences and opinions on the use of modern forms of voting. It is worth adding that some political parties in Poland take into account implementing i-voting in elections despite the lack of the legal basis and shortage of

experience. The political parties surveyed that support i-voting include Platforma Obywatelska (PO, Civic Platform), Kukiz'15, Partia Razem (Together) and Janusz Korwin-Mikke Party. Only one political party expressed their objection to i-voting, namely Prawo i Sprawiedliwość (PiS, Law and Justice), the governing party. Wider discussion on the relationship between political preferences and the support for i-voting in Poland is included in the paper on the attitudes of Polish voters towards the introduction of i-voting depending on political factors (Musiał-Karg and Kapsa, 2020). The discussion on remote voting methods used to be particularly vivid before consecutive parliamentary, presidential, local and European elections. While trying to raise their election capital, political parties declare their willingness to implement innovative voting methods (e.g., i-voting) to make the election process more convenient for those entitled to vote. The assumption is that this can mobilise voters which typically do not utilise their right to vote. Although the issue resurfaced in the public discourse during the pandemic, Poland was not ready to implement such voting procedures from the legal and infrastructure points of view.

Table 3 Answers to statement 1 and 2 with breakdown by political party preferences

<i>Political party voted for</i>	<i>Arithmetic average</i>	
	<i>Poland should introduce internet voting as an additional form of participation in elections</i>	<i>I would use the possibility of internet voting in elections</i>
SLD (Democratic Left Alliance)	4.02	3.79
KORWIN	4.24	4.49
Kukiz'15	4.25	4.33
Nowoczesna (Modern)	4.38	4.4
Partia Razem (Together)	4.52	4.38
PO (Civic Platform)	4.16	4.11
PSL (Polish People's Party)	3.82	3.54
PIS (Law and Justice)	3.55	3.46
Other	4.14	4.3
Hard to say	3.91	3.8
I would not vote	3.56	3.15

Focusing on the results of party preferences and opinions on the two statements, it is worth noticing that supporters of Partia Razem (Together) have the highest score regarding statement 1, since the party have shown their interest in promoting i-voting. The lowest score is in the group of voters supporting PiS (Law and Justice). It is the only political party that has not declared their interest in introducing i-voting in Poland. As regards responses to statement 2, which are more of individual declarations than general opinions, respondents indicated similar answers as to statement 1. The arithmetic average was 3.92. KORWIN voters have the highest score, whereas the score for those who would not vote is the lowest. It is worth to note that PiS voters had the lowest score among all respondents who indicated their party preferences.

To summarise the results of the analysis, most (70%) of the respondents declared their interest in having additional voting methods to be available in Poland, and the most

preferred voting methods were i-voting and electronic voting at a polling station. The highest support for i-voting has been recorded in voter groups of 35–44, well educated, living in big cities (their responses are not differentiated by gender). Interestingly, similar scores are recorded for the use of e-gov services (Musiał-Karg and Kapsa, 2019). Moreover, the openness to electronic democracy tools has been growing together with experience in using them. So we can say that if someone uses e-gov services, the person would like to have more such services offered, including elections. Such preferences are also connected with new technology proficiency. According to a Canadian report entitled ‘A Comparative Assessment of Electronic Voting’ (2009), in 2005, 20% of i-voters stated that if there was no possibility of voting over the internet, they would not have participated in the election at all. In 2007, 11% of voters declared that probably or certainly they would not have voted, if there had been no i-voting available. This shows that the possibility of voting over the internet may influence the election turnout or at least change the structure of voter groups, especially among those who usually do not participate (Goodman et al., 2010, p.3).

4 Conclusions

The digital revolution affects many spheres of human and institutional activities, causing the use of electronic communication tools to improve processes and facilitate the use of services for citizens. Especially for younger generations, electronic solutions are not only convenient but also natural. So if we want to provide more e-services for citizens, digital solutions should be promoted. The internet is used in many public services, although still rarely in elections. Its particular meaning and wide possibilities of use have grown in importance during the Covid-19 pandemic. Also regarding the elections it turned out that traditional voting methods are not applicable in a situation of limited social contact. It realised that the need for alternative voting methods was urgent, since most governments organising elections in 2020 had to postpone elections as lockdown was introduced in almost every country.

Poland is not even debating on implementing any of the electronic voting methods which is caused by the shortage of infrastructure of the internet-based voting system and legal solutions. Nevertheless, the Poles present the positive attitudes towards i-voting. Analyses of data coming from survey conducted in 2018 show that most of the respondents declared their interest in having additional voting methods available in Poland. Moreover, i-voting and electronic voting at a polling station generated much interest in comparison to other methods. Furthermore, respondents declared they would vote online if possible. Conclusions from the analysis of how demographic features and political preferences differentiate opinions on i-voting are as follows: apart from gender, the other demographic features differentiate the answers of the respondents in such way that the highest support for i-voting has been recorded in respondent groups of 35–44, well educated, and living in big cities, whereas the least positive towards i-voting are people at the age of 55–64, poorly educated, and living in rural areas. When we collate opinions on i-voting with political preferences, we can see a clear relationship between them. Descriptive statistics presented in the paper indicate that the lowest support for i-voting is typical for supporters of PiS (Law and Justice), which is actually the only political party in Poland objecting to the implementation of i-voting. According to the analysis, supporters of parties which promote i-voting (Kukiz’15, Korwin, Together)

show the highest interest in i-voting. Their responses to the two statements were in line with political agendas of their parties. In the case of PO (Civic Platform), which promotes i-voting as an alternative voting method, voters do not show such positive attitudes towards i-voting. However, it is worth noticing that their scores have always been higher than the population average.

The analysis of the data confirms the link between political preferences and the support for online voting. According to the survey, opinions expressed by voters are convergent with their political preferences. The results lead to a general conclusion that political preferences are a statistically significant predictor for voters' attitudes towards the introduction and use of i-voting. Furthermore, supporters of political parties that promote the introduction of online voting are more reserved in their declarations, as they recognise threats of new election participation methods. This is an important conclusion in the context of the difficulties in organising elections in 2020 in Poland and could motivate the oppositional political parties to introduce i-voting as a project to work on in the future.

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