EXAMINING THE INFLUENCE OF I-VOTING ON ELECTORAL ENGAGEMENT IN ESTONIA

Tomáš Janči

University of Ss. Cyril and Methodius in Trnava; Faculty of Social Sciences; Department of Political Science, Bučianska 4/A 917 01, Trnava
TomasJanci77@gmail.com

Abstract

This article presents an investigation into the impact of Internet voting (i-voting) on voter turnout in Estonia. The goal is to analyse existing data to determine the extent to which it affects voter turnout. The research carefully examines trends in voter turnout and the use of i-voting to address the question of how technology affects voter engagement. The study aims to provide insight into the relationship between voting adoption and voter behaviour by examining the data. This will contribute to the ongoing debate on electoral technology and offer valuable directions for future research and policy development in this area.

Key words: *electronic voting, i-voting, elections, voting turnout, Estonia.*

INTRODUCTION

Estonia has positioned itself as a digital powerhouse despite its relatively smaller size. The nation's commitment to technological progress and digital literacy is underscored by the fact that 99 % of public services are available online 24/7. This achievement is attributed to the ProgeTiiger programme launched in 2012 [Soares, 2023]. Estonia's digital success is largely attributed to the X-Road platform, which provides secure access to e-government services and promotes transparency, trust, and public engagement [Rausch, 2023]. The introduction of electronic identification cards in 2002 has further simplified accessibility, enabling citizens and residents,

including those from other countries, to easily navigate a wide range of online services [Tshakna, 2013]. Estonia's ability to leverage innovation despite its compact stature is exemplified by this digital evolution.

The X-Road software for e-democracy initiatives includes internet voting (i-voting) as one of its tools. I-voting systems enable voters to cast their votes from various locations, including public computers, voting kiosks in polling stations, or any Internet-connected device available to them. The votes are transmitted over the Internet to a central tally server. This method has been discussed in various studies [Council of Europe, 2010; Wolf et al., 2011; Musia-Karg, 2019]. First introduced in 2005, i-voting has become a cornerstone of Estonia's democratic environment. The widespread adoption of i-voting across various electoral contexts positions Estonia as a trailblazer in pioneering its use as an alternative voting channel. The experience gained from Estonia can be a valuable resource for entities worldwide seeking to modernise democracy through technology [Ehin et al., 2022].

While several countries are experimenting with online voting, no country has embraced it as widely as Estonia. The accessibility and convenience provided by i-voting have led many Estonians to prefer the online format to traditional in-person voting. This trend is supported by upcoming statistics. According to Kapsa [2021], this shift demonstrates how 21st-century technologies can effectively reshape and improve processes that were conceived in the 20th century.

Therefore, this article examines the impact of electronic voting on electoral participation and democratic processes in Estonia. The development of e-democracy tools within the X-Road software has had a significant impact on accessibility and turnout. Estonia's experience provides meaningful insights for entities worldwide seeking inventive approaches to democratic systems. This article explores the intricate relationship between modern technology and established democratic practices.

1. I-VOTING IN ESTONIA

Looking back, the former Minister of Justice, Mert Rask, made the first proposal for e-voting in 2001, in line with ongoing reforms of the electoral process in the Ministry. Estonia, already a trailblazer in digitalising public administration and operating Internet banking, welcomed the concept. Then-Prime Minister Mart Laar viewed e-voting as a means to enhance electoral participation. The practical implementation of i-voting was facilitated by the presence of electronic identification cards (e-ID) and electronic signatures [Madise, Drechsler, 2004]. In 2002, legal

frameworks for new electoral procedures were created, followed by a security analysis in 2003. The National Electoral Commission outsourced the development of i-voting to the local software company Cybernetica, based on conceptual material from a specialised group [Ehin et al., 2022]. I-voting was first introduced in the 2005 municipal elections, with a turnout of 1.8 %. Subsequently, it was used in the 2007 parliamentary elections, where the turnout increased to 5.4 %. The highest turnout was recorded in the 2009 European Parliament elections, where it peaked at 14.7 % [Kitsing, 2014].

I-voting was originally introduced as an alternative to traditional in-person voting. It offers convenience during the early voting period, from the tenth to the fourth day before the official election day. To use i-voting, voters must install the application, which is available on the official election website and accessible from anywhere with an internet connection. Before entering the interface, voter verification via electronic ID or mobile ID is mandatory. After entering a virtual environment displaying the candidates for their constituency, voters can complete the voting process with a simple click.

The individual votes are then sent online to a central server under the administration of the National Electoral Commission. The voter's eligibility is verified, ensuring the secrecy of the vote. The Electoral Commission counts all anonymous online ballots and generates certificates at each step to confirm the audit. This process is carefully documented and monitored to ensure transparency and accountability [e-Estonia, 2021].

The National Election Commission has the option to evaluate i-voting results up to four days before regular elections, allowing them to address potential system errors. Voters are able to cast multiple ballots within a specified time, but only the last choice will be considered valid. To enhance security and ensure the integrity of i-voting, polling stations provide the ability to request information about recording electronic votes [OSCE, 2023]. In exceptional circumstances, the National Electoral Commission may annul i-voting results, allowing affected voters to cast ballots directly at polling stations without nullifying the entire election [Górny, 2021].

2. METHODOLOGY

Taking into account local, national (parliamentary) and European dimensions, the article presents quantitative research and data on voter turnout from 2005 to 2023. The main goal of the research is to assess and analyze the impact of the implementation of electronic voting on voter turnout in several election cycles in Estonia. The research focuses on examining the impact of electronic voting on voter

engagement and participation in subsequent electoral processes. The aim is to identify patterns, trends, or shifts in voter behaviour over time due to the integration of electronic voting, contributing to a better understanding of its long-term effects on voter turnout. Therefore, the research question is formulated as follows:

Q: How has the implementation of e-voting affected electoral participation in voting cycles?

The official website of the Estonian National Electoral Committee and the State Electoral Office (valimised.ee/en) is a crucial repository of all election-related data necessary for this research. To ensure accurate data interpretation, we rely heavily on this comprehensive resource as a cornerstone of our investigation. Furthermore, we also consider the insights presented in Tsahkna's [2013] publication, 'E-voting'. Our article draws on 'Lessons from Estonia' and Ehin et al.'s [2022] 'Internet voting in Estonia 2005-2019: Evidence from 11 elections' as secondary sources. The authors explore the nuanced intersections of i-voting and electoral participation.

We provide not only a numerical analysis but also a wider story, offering background information and definitions regarding the complexity of i-voting in Estonia. Our data synthesis is based on academic sources, independent reports, and relevant newspaper articles. For the richness of our narrative, these diverse sources become essential, bridging the gap between academic discourse and the lived reality of the local context – a vital element in understanding the multifaceted development of a country.

The research utilises the following logical methods:

- Data Analysis: Used primarily in interpreting information from The Estonian National Electoral Committee and the State Electoral Office website, including quantitative analysis of election data and trends.
- Analysis of Secondary Sources: Used in researching the publications of Tsahkna [2013] and Ehin et al. [2022], which enrich the study by incorporating insights from existing research.
- Descriptive approach: Applied to provide contextual information about i-voting in Estonia, including definitions, potential pitfalls, and general insights into the country's political and digital landscape.
- Integrating different sources: Used throughout the article to synthesise information from academic literature, official reports and newspaper articles to promote a comprehensive understanding of the topic.

- Narrative construction: Used to connect statistical findings into a coherent narrative, making research accessible and engaging to a wider audience.

In summary, our study employs a range of logical methods, including quantitative analysis, examination of secondary sources, a descriptive approach, and source integration, to comprehensively explore the impact of electronic voting on electoral participation in Estonia. By seamlessly connecting statistical insights through narrative construction, we present a concise and engaging story that captures the evolving dynamics of e-voting within the country's democratic processes.

3. RESULTS

The topic of electoral participation and the potential for increasing it through electronic voting is frequently discussed. Tshakna's [2013] research on the impact of technology on voter participation in elections between 2005 and 2011 found that introducing i-voting increased participation, as evidenced by graphic and numerical data. The study focused on all types of elections during that period, from municipal to parliamentary to European Parliament elections. However, a study by Ehin et al. [2022] found that although the number of voters who regularly go to the polls has stabilised, an increasing number of citizens from the active electorate prefer to vote online. This finding suggests that modern technologies may not necessarily lead to a rapid increase in voter turnout or mobilisation of non-voters. Our research from January 2023 supports the trend of increasing online voter participation. While the average participation rate in parliamentary elections is around 60 %, over half of voters (51 %) in the 2023 parliamentary elections voted online for the first time in history. While the average participation rate in parliamentary elections is around 60 %, over half of voters (51 %) in the 2023 parliamentary elections voted online for the first time in history. The accompanying graphic illustrates this trend using data from various types of elections.

Table 1

Overview of Electoral Participation in Various Types of Elections

Type of election	Turnout (%)	Share of online votes (%)
1	2	3
Parliamentary elections 2023	63,5	51.1
Local elections 2021	54,7	46.9
European Parliament elections 2019	37,6	46.7

The End of the Table 1

1	2	3
Parliamentary elections 2019	63,7	43.8
Local elections 2017	53,3	31.7
Parliamentary elections 2015	64,2	30.5
European Parliament elections 2014	36,5	31.3
Local elections 2013	58,0	21.2
Parliamentary elections 2011	63,5	24.3
Local elections 2009	60,6	15.8
European Parliament elections 2009	43,9	14.7
Parliamentary elections 2007	61,9	5.5
Local elections 2005	47,4	1.9

Source: *Author, based on Valimised, [2023].*

Several trends can be identified based on the data presented in the table above:

- **Differences in voter turnout**: Voter turnout varies depending on the type of election and year. The 2015 parliamentary elections had a relatively high turnout of 64.2 %, while the 2019 European Parliament elections had a lower turnout of 37.6 %.
- **Increased acceptance of Internet Voting:** The rise in online voting suggests that Estonian voters are increasingly accepting and adopting i-voting. This trend indicates a shift towards using digital platforms for electoral participation, potentially influenced by factors such as convenience, accessibility, and trust in the system.
- **Stabilisation of voter turnout:** Additionally, despite fluctuations in voter turnout across elections and years, there appears to be a stabilization of the percentage turnout over time. The consistent turnout patterns observed may be

influenced by various sociopolitical factors and the integration of online voting as a common element in electoral procedures.

In summary, our data analysis suggests that electoral participation has stabilised at specific levels, which vary based on the type of election. Additionally, there has been a noticeable increase in the adoption of i-voting among voters. The data shows that i-voting has transitioned from an experimental phase to a standard practice in Estonian electoral procedures. It is widely accepted in local election parlance and is now recognized as a standard feature rather than an innovative experiment, both domestically and internationally. The Estonian government's long-term commitment to digitisation and the perceived efficiency and financial benefits of adopting new technologies have established i-voting as a legitimate and integral part of the electoral process in Estonia. This recognition is due to the objective evaluation of the benefits of i-voting.

CONCLUSION

This article examines a distinctive trend in contemporary political science by exploring a country that pioneered i-voting nearly two decades ago. The available data reveal a growing preference among an active electorate for i-voting, rather than a significant mobilisation of the electorate, contrary to expectations. The Estonian experience challenges the popular hypothesis that technological integration in the electoral process universally leads to increased voter turnout. Instead, it highlights the importance of understanding voter preferences in the context of the chosen electoral channel. The intricacies of e-voting, especially i-voting, continue to pose interdisciplinary challenges even after years, making it a subject of ongoing debate and exploration.

The digitalisation of electoral processes is currently underway in several countries worldwide. Research of this nature is valuable as it examines current practices, allowing us to determine advantages, disadvantages, and risks, as well as the necessity of preventive measures in the form of risk management or educating the electorate regarding the functionality of individual systems and devices. The integration of e-voting presents both opportunities and challenges in modern electoral processes. The benefits of increased efficiency, faster vote counting, and improved accessibility for people with disabilities, as highlighted by Górny [2021], Batt [2019], and Wolf et al. [2011], underline the potential of electronic voting to revolutionise traditional voting methods. Additionally, the reduction in administrative burden and potential cost savings in the long term further

strengthen its appeal [Batt, 2019]. However, the adoption of electronic voting raises significant concerns, particularly regarding security risks, privacy violations, and the potential for electoral manipulation. These concerns have been highlighted by Górny [2021], Birch et al. [2014], and Wolf et al. [2011]. In addition, technical challenges such as ensuring the anonymity and reliability of the electoral system and resolving legislative and social obstacles require careful planning and ongoing evaluation [Anne, 2007; Toots, 2016]. Successful implementation requires a multifaceted approach, including political support, organizational integration, compliance with democratic principles and strict technical standards [Goldsmith, Ruthlauff, 2013].

As electronic voting continues to evolve, interdisciplinary research and collaboration are essential to master its complexity and ensure the integrity and inclusiveness of electoral processes in the digital age.

Debates about the above-mentioned benefits or doubts are part of almost every election cycle, even in the Estonian context. Institutions and authorities responsible for the conduct of elections must, therefore, promptly respond to criticism either from politicians or sceptics from professional circles or the public. After the last parliamentary elections [March 2023], the most prominent voice at the local level was the politician Martin Helme, the leader of the opposition Conservative People's Party (ERKE), who rejected Estonia's electronic voting as unfounded after the recent election expressing dissatisfaction after his party failed to secure a leading position, finishing behind The Estonian Reform Party and ending up in the opposition. Helme argues that a well-organised campaign and pre-election calculations led by the Conservatives should have culminated in victory during the 2023 election. He also questions the Electoral Commission's approach and criticises the extension of time it takes for results to be published, especially for online voting. In response, ERKE initially contested the election results, eventually leading to legal proceedings [ERR, 2023]. Subsequent reports indicate that the Estonian Supreme Court has dismissed complaints related to i-voting. However, the court proposed including new constitutional provisions regulating this matter [ERR, 2023].

Concerns are not limited to political figures, but also to IT experts. For example, Thomas Scott, a well-known British web developer and internet content creator, criticised Estonia's e-voting in a video (uploaded in 2019) that has been viewed more than 4.5 million times on his YouTube channel. He highlighted independent reports showing weaknesses in the system and an outdated architecture vulnerable to cyber threats from abroad, whether at the level of individual voting machines or

the central server that counts the votes. In particular, Scott dismissed the idea that blockchain technology would solve these problems, highlighting its role solely as a data storage system, the complexity of which is difficult to explain to the general public [Scott, 2019].

During a visit to the e-Estonia centre in November 2023, we sought further insight and raised common critical comments with local experts. Erika Piirmets, the local digitalisation advisor, acknowledged that similar concerns and complaints arise in almost every election in the country. However, she said that despite these challenges, the system was working effectively and had earned the trust of a significant proportion of citizens – underlined by the supporting data presented earlier. This dual perspective highlights the ongoing discourse on e-voting, where scepticism and trust are intertwined in assessing its functionality and security.

In the future, it will be interesting to observe the progress of the issue we are investigating in the most advanced Baltic state. Every decision, every innovation and every flaw in the system represents a new opportunity for improvement and research. In the best-case scenario, Estonia has the potential to become the first country where citizens prefer to vote from the comfort of their homes and physical voting becomes less common. In the worst case, e-voting may only work until a significant breakthrough undermines citizens' confidence in this voting channel.

In conclusion, the field of e-voting, especially its online manifestation, offers a rich terrain for future research and exploration. Several aspects deserve in-depth examination to improve our understanding of the multiple implications and dynamics associated with this evolving electoral channel. Potential avenues for future research include a comprehensive analysis of socio-demographic factors influencing e-voting preferences, a thorough examination of existing cybersecurity measures and their effectiveness, an examination of public perceptions and attitudes towards e-voting over time, and an assessment of the impact of evolving technologies on the development of e-voting systems. In addition, comparative studies in countries with different experiences of e-voting can provide valuable information on best practices and challenges. As technology continues to evolve, ongoing research efforts will play a key role in shaping the future of e-voting and its role in democratic processes.

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