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Adult Education and Political Participation: Evidence from East German *Volkshochschulen*

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Adult Education and Political Participation: Evidence from East German *Volkshochschulen**

Abstract

This paper examines the effects of voluntary, non-formal adult education on political attitudes, participation, and partisanship, exploiting the expansion of courses at East German *Volkshochschulen* (VHS) after reunification. Combining administrative VHS data with individual survey data and federal election results, we use quasi-random variation in local course availability to identify causal effects in two-way fixed effects models. We find no significant impact on political attitudes and partisanship, suggesting that political socialization and ideologization play limited roles in adult education. Yet, courses significantly affect some forms of political participation, as they increase volunteering and reduce turnout. These effects are not driven by civic education courses. Further participatory behaviors remain unaffected. This variation in effects across participatory behaviors hints to a more complex relationship than commonly assumed: One may only understand the effect of adult education on political participation when understanding its effects on other areas of life as well, given the interplay of the productive and political roles of human capital.

JEL classification

H52, I26, N34, P20

Keywords

lifelong learning, democracy, political participation, turnout, East Germany, German reunification

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1 Introduction

It is widely believed that education fosters democracy. This idea, with a long intellectual history tracing back to Aristotle (Lochner, 2011), was advanced by Enlightenment philosophers such as Immanuel Kant (1784, 1795). Later on, it became a foundational element for modernization theorists (e.g. Lipset, 1959) as well as educational reformers like John Dewey (1916). However, current global developments challenge this belief. Despite the strong educational expansion during the last century, today's global political landscape is experiencing rises in populism and authoritarianism (see, for example, Lee and Lee, 2016; Economist Intelligence Unit, 2024). This democratic backslide renews interest in the drivers of democratic attitudes and political participation, and in the role education plays in shaping them.

Hardly investigated - to the best of our knowledge - is the contribution of adult education.¹ In democracies, where political power stems from majority support, mobilizing a vast number of individuals can lead to substantial changes in the political landscape. Since adults are entitled to vote, in contrast to minor pupils, adult education may directly affect political outcomes without a time delay. In addition, at any given time, the target group of adult education is larger than that of other forms of education. While compulsory schooling affects everyone at some point in their life, adult education may be especially relevant in the context of political transformations and upheavals, as it reaches populations beyond compulsory schooling.

This paper evaluates how adult education affects political participation, attitudes and partisanship using the substantial expansion of such courses in East Germany after the German reunification in 1990. Before the reunification, East Germany was a socialist state with a one-party system, systematic repression of dissident voices, and human rights violations. With the reunification, East Germany adopted the West German political system with its multiparty democracy and federal parliamentary republic. Hence, this situation imposed a natural experiment that we use to identify the causal effects of adult education² to political participation in a period of political transformation, with more general implications as well.

Based on the pedagogical theories and the related literature, we derive three hypotheses that we later test empirically: Firstly, we expect adult education to affect political participation but not political attitudes. Secondly, civic education is expected to have larger effects on political participation than courses on other topics. Thirdly, we expect courses to suppress support for anti-democratic parties without affecting partisanship

¹While causal evidence on the effects of schooling on political attitudes and participation has become increasingly available in recent years (see for example Milligan et al., 2004; Sondheimer and Green, 2010; Dee, 2004; Larreguy and Marshall, 2017; Croke et al., 2016; Siedler, 2010; Dang, 2019; Lai, 2024), comparable studies on the effects of adult education are still missing.

²The same experiment is used elsewhere to evaluate the effects of non-formal adult education on labor market integration (Rupieper and Thomsen, 2025) and on life satisfaction (Rupieper and Thomsen, 2026).

beyond that.

We study adult education courses provided by *Volkshochschulen* (VHS), which are the most important provider of voluntary adult education in Germany (Wittenbrink and Frick, 2018). VHS exist in almost every county and conduct courses, excursions, and one-time events on a wide range of topics. The majority of their program consists of weekly courses that run for a semester. Their education is typically non-formal and available at comparatively low cost. VHS have no specific target group and are open to everybody. Based on their history, they see themselves in the tradition of fostering democracy (Süssmuth and Eisfeld, 2018).³ In the German Democratic Republic (GDR), VHS were subordinated to and strongly regulated by the government. After reunification, they could decide autonomously on their course program again. In the following decade, the number of VHS courses increased substantially in East Germany. Between 1991 and 2001, their local availability nearly tripled from 1.3 to 3.6 courses per thousand inhabitants (see Table 2 in the appendix). During this time, East German VHS recorded nearly 5 million course participations in their courses (authors' calculations). This expansion led to substantial variation in the supply of courses over time, but also across counties at any given time. The described organizational features furthermore suggest the existence of quasi-random variation in local course availability.

For the empirical investigation, we build two novel datasets. Both are based on administrative VHS data (DIE, 2018) that inform on an annual basis about the educational activities of every individual school. Firstly, we combine the VHS data with individual-level data from the German Socio-Economic Panel (SOEP, see Goebel et al., 2019) on political attitudes and participatory behaviors for East Germany from 1990 to 2002, i.e. one year after the expansion of courses came to a halt. Secondly, we combine the VHS data with county-level electoral data from the German Election Database (Heddesheimer et al., 2025). This dataset includes all East German counties from 1990 to 2002, covering the federal elections of 1994, 1998, and 2002.

To identify the effects of VHS adult education on political participation, political attitudes, and partisanship, we exploit the spatial and temporal variation in the availability of courses. For this purpose, we use the number of VHS courses per thousand inhabitants as a continuous, county-level treatment variable and estimate two-way fixed effects panel models, which control for year-specific shocks and time-invariant heterogeneity between counties. For the analysis of individual-level data, we control for time-invariant heterogeneity between individuals instead of counties. Similar identification approaches have been used and are common in studies examining the effects of childcare expansions on different outcomes (see, for example, Bauernschuster et al., 2016; Sandner et al., 2025).

Our results suggest that adult education affects political participation by conveying relevant skills and knowledge, not by shifting political attitudes. We find no significant

³Research results referring to the substance of this self-image are not available so far.

effects of VHS courses on political attitudes, measured by the relevance of political influence for life satisfaction and the importance of being socially and politically active. However, the relation between education and political participation is more complicated than commonly depicted, as effect directions differ across participatory behaviors. We find positive effects on volunteering, but negative ones on turnout in federal elections. Political interest and participation in political parties, municipal politics, and citizen’s initiatives remain unaffected. Distinguishing courses by content, we find no evidence that courses on the topics of society & politics, which resemble civic education, drive these effects. Lastly, we find no effect of VHS education on stated party preferences. In large parts, party preferences revealed in federal elections remain unaffected as well.

By now, evidence on the effects of adult education remains scarce. To the best of our knowledge, there is only study showing that work-related adult education causally increases participation in civic, political, and cultural activities, without crowding out social participation (Ruhose et al., 2019). Two other studies look at the nexus between VHS education and voter turnout, the most frequently studied form of political participation. Martin and Reichart (2020) focus solely on courses on the topics of society & politics and find a positive association between enrollment numbers and voter turnout in the German federal elections of 2009 and 2013, with some evidence of party-specific effects. Schrader et al. (2020) look at both courses on society & politics and courses overall. In contrast to the previous study, they furthermore consider federal, state, and local elections and analyze a longer time period (1990 to 2014). Their results show no robust association between course numbers and voter turnout, but provide some evidence on systematic East-West differences.

We contribute to the literature in four ways. Firstly, in contrast to the existing observational studies on VHS education, we evaluate a natural experiment and thereby improve the internal validity of the existing evidence. Secondly, we add to the literature on the causal effects of education on political participation by extending it to non-formal, voluntary adult education. While the effects of school education are highly relevant, we think it is important to broaden our understanding of the role that further forms of education may play. Thirdly, a large share of the related literature measures political participation solely by voter turnout. We extend this literature to incorporate further forms of participatory behavior, namely civic engagement and psychological involvement. Fourthly, thanks to the comprehensive data at hand, we can study the micro-level mechanisms that underlay, drive and explain political participation observed at community or national levels, allowing for a more comprehensive understanding.

The rest of the paper is structured as follows: In section 2, we explain the theoretical perspective on how adult education may affect political participation and derive our hypotheses. Section 3 describes the expansion of VHS courses in East Germany after the reunification. Data descriptions can be found in section 4. In section 5, we demonstrate the

exogeneity of VHS courses' local availability and explain our empirical approach. Results on the effects of VHS education on political attitudes, participation and partisanship are reported in section 6. The final section 7 provides a discussion of our results.

2 Theoretical Foundations and Research Hypotheses

2.1 Theoretical Foundations

Education may affect political attitudes and behaviors via multiple mechanisms. From the multitude of respective theories, Willeck and Mendelberg (2022) synthesize three main theoretical strands on how education affects political participation:

Firstly, in the standard models, education is seen as a direct and immediate cause of political participation. These models stress that education imparts knowledge and specific skills, which may be helpful or even necessary for political participation. Examples include an understanding of the political system, knowledge of citizens' rights, literacy, and the ability to effectively communicate needs and preferences to politicians. In consequence, education may reduce the cost of acquiring an informed opinion and enable citizens' independent assessment of public policies. The validity of such theories is supported by evidence from empirical studies showing that political knowledge increases citizens' propensity to vote (see, for example, Larcinese, 2007) and that education protects against susceptibility to populist propaganda (see, for example, Wang, 2021).⁴

Secondly, socialization models view education as a complex, long-term, and rather indirect cause of political participation. Especially during the early, formative years of life, education is considered as primary socializing force along with the family and the community. Schooling, for example, transmits civic norms and perceptions that pupils may internalize. For doing so, courses do not even need to touch these topics explicitly. Implicit signals from schools' rules or teachers' conduct, sometimes also referred to as "hidden curriculum", suffice. One example for such an implicit signal is racial diversity, which is found to play an important role in shaping partisanship in the US (Billings et al., 2021). Yet, curricula can also explicitly cover topics like national identity or civic norms. Several studies using reforms of curricula support the validity of these socialization theories.⁵ Against this backdrop, it is not surprising that policy makers consider and

⁴Education may also foster forms of participatory behavior associated with stronger accountability of politicians and governments. For example, Botero et al. (2013) show that within countries, better-educated citizens are more likely to report official misconduct, crime and corruption, thereby reducing despotism. Education can also increase the quality of local governance by qualifying those eligible for political offices. Martinez-Bravo (2017) provides evidence on this channel using the expansion of mass education in Indonesia.

⁵Cantoni et al. (2017), for example, find that a textbook reform in Chinese high schools was successful in changing students' political attitudes. Students that had learned with the new politics textbook held more positive views of China's governance and were more skeptical towards free markets. The reform was also successful in changing students' views on democracy. Bai and Li (2020) find analogous results for

employ compulsory schooling as a nation-building tool (see, for example, Cinnirella and Schueler, 2018; Bandiera et al., 2019).

Thirdly, proxy theories state that education has neither a direct nor an indirect effect on political participation. Instead, it is social status that causes political participation. Here, education is viewed as a sorting variable, serving as a proxy for socio-economic status. This implies that educational attainment increases political participation only insofar as it raises social status. Status, in turn, matters only in relation to a peer group or otherwise defined point of reference. This view implies that relative education gains affect political participation, not absolute ones as stated by the previous theories. Consequently, if educational attainment increased for everyone, political participation should remain unaffected. Empirical evidence on the relevance of education as a sorting variable can be found for example in Fernández et al. (2023). Based on the European Social Survey (2016 - 2022), they show that socio-economic status, as measured by having an upper-class occupation and a high income, mediates a substantially larger share of the effect of education on pro-European attitudes than individuals' values.

2.2 Research Hypotheses

When thinking about the effects of adult education, we consider the standard models to provide a helpful theoretical framework. Socialization models, on the other hand, are not expected to apply, given their focus on pre-adult education during early, formative years. As VHS courses compose a relatively weak intervention that presumably does not change participants' socio-economic status, neither do we expect the proxy theories to apply.⁶ If adult education affects participants' political participation according to the standard models, we would find significant effects on measures of political participation but none on measures of political attitudes. This leads to our first hypothesis, which we test empirically:

H1 Adult education affects political participation, but not political attitudes.

Building on the first, central hypothesis, we explore the underlying mechanism behind the potential effects in more detail. Education may matter especially when it teaches about government, democracy, and civic norms, combining information and socialization mechanisms. Such courses are also referred to as “civic education” (see, for example,

curricula changes in Taiwan. However, using a later curriculum reform in Taiwan, Hong and Lyu (2025) show that reforming history curricula can lead to unintended “backlashes” by changing the information demand of students. Using the case of the German Third Reich, Voigtländer and Voth (2015) find that indoctrination at a young age has persistent and lifelong effects on pupils' anti-Jewish beliefs.

⁶We refrain from testing the impact of VHS education on individuals' socio-economic status as most of its measures include, among others, information about educational attainment and participation (see, for example, Diemer et al., 2013). Alternative measures concern individuals' growing up, for example by capturing the educational attainment of their parents. In consequence, such measures do not reflect status changes achieved in adulthood and are thus not suitable for our analysis.

Willeck and Mendelberg, 2022). Among the wide array of VHS courses, civic education finds its closest equivalent in courses on the topics of society & politics (see, for a similar view, Martin and Reichart, 2020; Schrader et al., 2020). These courses cover for example topics such as history, including local history, foreign countries, cultures, religions, and ecology as well as practical questions on, for example, income tax returns or financing home ownership. Some courses also explicitly target political topics like the European integration, political systems or processes. If civic education drives the overall effect of adult education on political participation, we would find a larger effect for the courses on society & politics compared to those on other topics. This leads to our second hypothesis:

H2 Civic education has a larger effect on political participation than courses on other topics.

The third hypothesis addresses the question whether VHS courses shift party preferences. While we previously hypothesized that adult education does not affect political attitudes, a related study documents significant correlations at the regional level between parties' vote shares and the number of VHS courses (Martin and Reichart, 2020). Such findings are highly relevant, given that electoral success is, in democracies, directly linked to political outcomes such as policy change. Based on their reputation of fostering democracy, one might expect VHS courses to suppress support for anti-democratic parties. Beyond that, we do not expect VHS to systematically affect party-specific support, for multiple reasons. Firstly, the first hypothesis already stated that adult education is not expected to affect political attitudes. Secondly, VHS see themselves in the tradition of fostering free and informed opinion formations, which contradicts ideologizing and indoctrinating intentions. And lastly, VHS depend in large parts on public funding. Potential partisanship effects could incentivize politicians to use subsidies for clientelistic purposes. This leads to our third hypothesis:

H3 VHS education reduces support for anti-democratic parties but does not affect partisanship beyond that.

Given the notoriously difficult definition of what constitutes an anti-democratic party, we rely on the ideological party categorization of Rooduijn et al. (2024). Their PopuList identifies populist, far-left, and far-right parties among all European parties that have won at least one seat or at least 2 % of the vote in national parliamentary elections since 1989. During the time period of interest, they demarcate two populist parties in Germany: The far-right *Republikaner* and the far-left *Partei des Demokratischen Sozialismus* (PDS, Party of Democratic Socialism).⁷ The latter stands in direct continuation of the *Sozialistische Einheitspartei Deutschlands* (SED, Socialist Unity Party), the communist party formerly

⁷In 2007, the PDS merged with a small radical left party from West Germany into *Die Linke* (The Left) and has been considered as a border case in the PopuList since then (see Froio et al., 2023).

ruling in the GDR. Given the small vote share for the Republicans, we pool their vote share with that of further far-right splinter parties, as denoted by Heddesheimer et al. (2025, Table 2). This includes, for example, the *Nationaldemokratische Partei Deutschlands* (NPD, National Democratic Party), *Die Rechte* (The Right), and *Deutsche Volksunion* (DVU, German People’s Union).

3 Volkshochschulen in East Germany

3.1 History and Objectives

VHS draw on a long history in Germany. Their first predecessors arose in the late 19th century in the context of labor and democracy movements (Süssmuth and Eisfeld, 2018). When the Weimar Republic, the first democratic state on German territory, was founded in 1918, its new constitution obliged the republic and its federal states and municipalities to promote adult education (Olbrich, 2001, p. 139). In the following years, VHS surged and became widespread: in 1919 alone, 139 new VHS were established (Süssmuth and Eisfeld, 2018, p. 767). Among their goals was to enable and educate citizens to actively participate in the new democratic state. In the Third Reich (1933-1945), civil-society organizations, including VHS, were subject to *Gleichschaltung* (forcible-coordination). Consequently, they either adapted the National Socialists’ ideology or were shut down (Süssmuth and Eisfeld, 2018). After WWII, VHS were allowed to reopen in all four occupation zones, drawing on their democratic tradition (Siebert, 2001). Therefore, VHS continued to exist in both German states.

In contrast to their West German counterparts, East German VHS were subject to strong governmental regulation (Süssmuth and Eisfeld, 2018, p. 769). In the GDR, education and ideological indoctrination were typically closely intertwined (Hoggan-Kloubert et al., 2025). The ideological alignment of VHS education was controlled for, for example by unofficial collaborators of the State Security Service (*Staatssicherheit* or simply *Stasi*) who attended courses incognito (Siebert, 2001, p. 291f). However, Siebert (2001, p. 273, translated by the authors) doubts the success of these indoctrination efforts, referring to adults’ resistance to ideological re-education. State control extended to the design of curricula and the selection of teaching staff (Hoggan-Kloubert et al., 2025). Furthermore, VHS courses were not open to everyone: participation required formal delegation. Once selected, attendance became mandatory. While the topical focus of the GDR’s VHS courses changed over time, they were primarily known as a night school where adults could obtain secondary school-leaving degrees (Siebert, 2001; Gieseke, 1994).

After reunification, the majority of East German adult education organizations ceased operations (Siebert, 2001). VHS were among the few organizations that persisted, in part due to advance state funding from the GDR, which secured their operation in 1990.

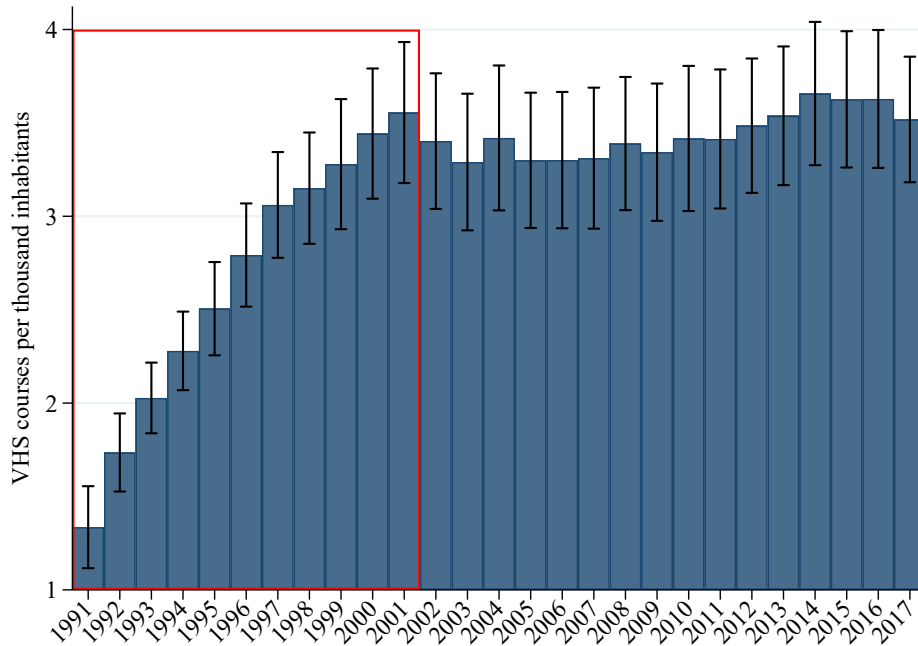
With reunification, the strong governmental regulation came to an end and East German VHS regained autonomy. Already in 1990, East German VHS joined up in newly founded state-level associations and entered the nationwide umbrella organization, the *Deutscher Volkshochschul-Verband* (DVV). Partnerships between East and West German VHS were established to support the transition of East German VHS, which faced challenges such as developing new organizational structures and securing funding. Since reunification, East German VHS have autonomously determined course programs, curricula, and staffing. A generational shift occurred among staff, as many school managers were pensioned off after reunification (Siebert, 2001, p. 299) and educational activities expanded into new subject areas (see Figure 10 in the appendix). Courses are no longer prescribed to convey a specific ideological viewpoint but instead cover a plurality of perspectives. Lastly, participation in courses is once again entirely voluntary.

3.2 Provision of Courses

The number of courses carried out by East German VHS increased substantially in the years following reunification. In 1991, on average, 1.3 courses were realized per thousand inhabitants (see Figure 1 and Table 2 in the appendix). By 2001, the availability of VHS courses nearly tripled to 3.6 courses per thousand inhabitants (ibid.). In the following years, average course availability fluctuated around a stable level and the expansion leveled off. In our analysis, we therefore focus on the 1991-2001 expansion period to exploit quasi-random variation in course availability. Figure 2 displays not only the expansion of VHS courses over time, but also the substantial spatial variation of course availability for selected years.

Research on the determinants of VHS course programs emphasizes the role of coincidences (see, for example, Schrader, 2011; Fleige et al., 2019). Course programs are designed and organized by the local school manager. Participants and teachers are not systematically involved in the process. Managers try to factor in future interest and demand for courses, but lack a systematic procedure for doing so. Established courses are often copied into the next course program. Innovations, such as the introduction of new courses, depend on the school manager's views, preferences, and social networks. VHS rely heavily on subsidies, and 28 % of their budget is financed through subsidies paid from local authorities (see Table 3 in the appendix), that is municipalities and the county. However, this share declined over time (see Figure 8 in the appendix), suggesting that local subsidies did not drive the course expansion. In fact, VHS draw funding from a wide variety of sources, which reduces the potential influence of local economic conditions, public budgets, and tax capacities. Taken together, these features suggest quasi-random variation in local VHS course availability, particularly during the 1991-2001 expansion period.

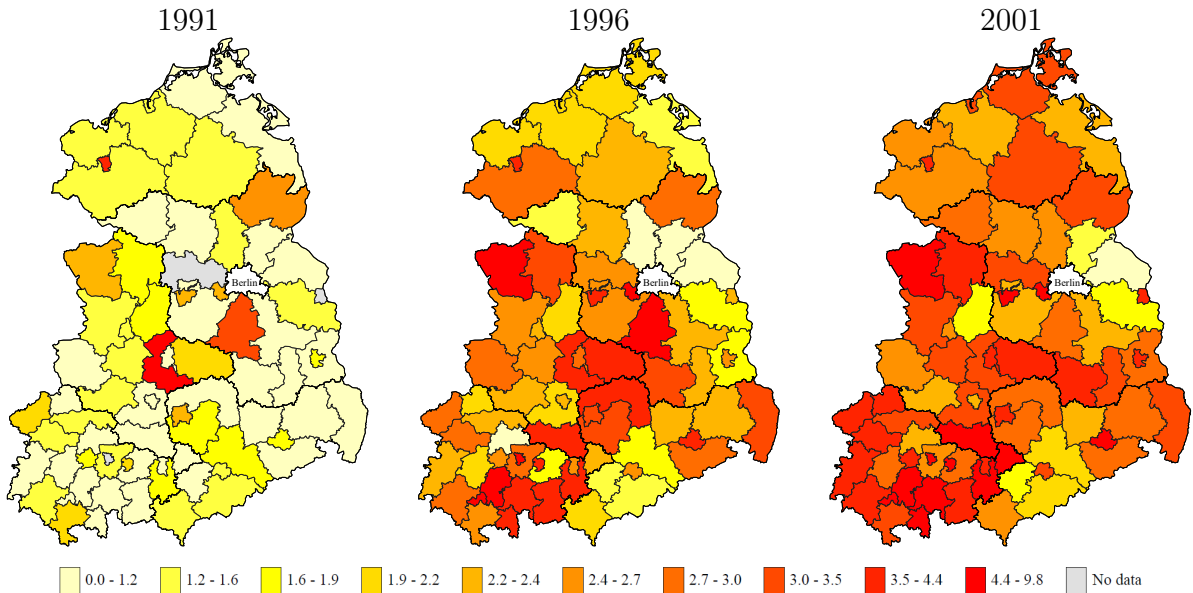
Figure 1: Availability of VHS Courses in East Germany Over Time



Data Sources: VHS statistic, BBSR.

Notes: Figure displays the mean number of VHS courses per thousand inhabitants for East German counties, given the county boundaries as of late 2021. The red box highlights the expansion period. Table 2 in the appendix provides the exact numeric values.

Figure 2: Spatial Variation in the Availability of VHS Courses



Data Sources: VHS, BBSR, © GeoBasis-DE/BKG 2024

Notes: The maps display the number of VHS courses per thousand inhabitants for East German counties. For three counties, Frankfurt (Oder), Havelland, and Weimar, there are no VHS reports in 1991. County boundaries as of late 2021.

4 Data

4.1 Administrative Data from the VHS statistics

The administrative data from the VHS statistics (DIE, 2018) provide the foundation for our empirical analysis. Compiled by the German Institute for Adult Education, the statistics report the educational activities of almost all VHS in Germany (DIE, 2014). The panel dataset contains information on each school’s number of courses, events, teaching hours, and enrollment figures, also disaggregated by topical program areas. The first survey took place in 1962. Although data are digitally available for all years since 1987, East German VHS began reporting only in 1991.⁸

For our analysis, we combine the VHS statistics with two datasets that provide information on political participation, attitudes, and party preferences (see below). To link these datasets, we aggregate the VHS data to the county level. The reorganization of county boundaries in East Germany requires harmonizing the data to a consistent set of county boundaries. We implement this step using a population-based crosswalk from the Federal Office for Building and Regional Planning (BBSR, 2024). For school mergers and splits, we follow the procedure of Ruhose et al. (2023). Because the VHS statistics do not distinguish between East and West Berlin schools, we exclude Berlin from our analysis. To account for regional population differences, we define course availability as the number of courses per thousand inhabitants. Using relative rather than absolute course numbers ensures the comparability across counties with different population sizes. The necessary annual county-level population data come from the Federal Office for Building and Regional Planning (BBSR, 2024).

4.2 Electoral Data

To analyze turnout and partisanship in federal elections, we combine the VHS statistics with the German Election Database (Heddesheimer et al., 2025). This database provides comprehensive information on the outcomes of federal, state, and local elections, including voter turnout and party vote shares. To enhance comparability across regions and over time, we restrict the analysis to federal elections. By contrast, local and state elections are scheduled in an asynchronously manner across federal states⁹, which hampers comparability over time. In addition, the ballot systems for local elections vary across federal states.¹⁰ Finally, local chapters of political parties may diverge substantially from their national counterparts, impeding the regional comparability of party vote shares in local and state

⁸Since some schools started to report later, we have no VHS data for three of the 75 East German counties in 1991. In the following years, the share of non-reporting schools declined rapidly. Since 1993, the VHS statistics have covered all East German counties.

⁹See, for example, Figure 1 and 3 in Heddesheimer et al. (2025).

¹⁰See, for example, Table 1 in Heddesheimer et al. (2025).

elections.

Merging these data with the VHS statistics results in a regional dataset that covers all 75 East German counties and informs about the outcomes of the 1994, 1998, and 2002 federal elections. On average, 73.65 % of the eligible voters voted (see Table 4 in the appendix). The most popular party was the *Sozialdemokratische Partei Deutschlands* (SPD, Social Democratic Party of Germany) with an average of 37.15 % of the vote. The *Christlich Demokratische Union* (CDU, Christian Democratic Union) and the PDS, which stands in continuation of the formerly ruling socialist SED, also obtained substantial support (31.36 % and 18.52 %, respectively). The liberal *Freie Demokratische Partei* (FDP, Free Democratic Party) and *Bündnis 90/Die Grünen* (Alliance 90/The Greens) were less popular and received 4.42 % and 3.88 % of the vote, respectively. Various far-right parties received 2.67 %.

4.3 Survey Data

To analyze the individual-level effects driving aggregate changes, we construct a second dataset by combining the VHS statistics with individual-level data on political attitudes and behavior from the SOEP (Goebel et al., 2024). This second dataset covers East German SOEP respondents from 1990 to 2002, i.e. one year after the VHS course expansion in East Germany ended.

The SOEP is an annual, representative household panel survey covering a great variety of topics. It provides comprehensive individual-level data for West Germany from 1984 onward. In June 1990, the first surveys were conducted in East Germany (Wagner et al., 2008). The SOEP is the only longitudinal household survey worldwide that captures the political reunification of a formerly divided society, as the survey territory was expanded four months before the reunification and one month before the Economic, Social and Monetary Union between East and West Germany (Goebel et al., 2019). Given our focus on the effects of adult education in East Germany, we restrict the sample to respondents aged 18 or older living in East Germany at the time of the interview. To improve sample consistency, we furthermore consider only individuals who lived in East Germany before German reunification.¹¹ Table 5 in the appendix reports the corresponding summary statistics.

The SOEP covers a wide range of topics, including various forms of political participation, party preferences, and political attitudes. We select items based on their alignment with our hypotheses. As not every item is included in the survey every year, an additional selection criterion is that they were asked at least twice during the sample period. This allows us to capture within-person changes in response to an increased availability of VHS

¹¹The representativeness of the SOEP for the East German resident population has been demonstrated, for example, by Frick and Goebel (2008). To ensure representativeness, we apply the cross-sectional individual weights provided by the SOEP.

education.

To capture political attitudes, we rely on two measures. First, respondents rate how relevant political influence is to their life satisfaction. We recode the originally four-point Likert-scaled item into a binary indicator that equals one if the respondent considers political influence important and zero otherwise. Viewing political influence as a means to improve well-being may be a crucial motivator for political participation. In fact, it is hard to imagine a sustained democratic regime without citizens that realize the benefits of political engagement. The second measure comes from an item battery on life goals and belongs to the value-based life goal categorization proposed by Kluckhohn and Strodtbeck (1961). This item assesses how important respondents consider being socially and politically active. In comparison to the first attitudinal item, this measure reflects a more intrinsically motivated and altruistic basis for political participation. Again, we recode the original four-point Likert-scaled item into a binary indicator that equals one if respondents consider being socially and politically active important and zero otherwise.

We use three measures of individuals' political participation and its precursors. Political participation is typically preceded by psychological involvement, that is political interest and attentiveness (also referred to as "invisible" participation by Talò and Mannarini, 2015, p.801). The first measure thus captures individuals' interest in politics. Originally, this item is measured on a four-point Likert scale from "not interested at all" to "very much interested". We dichotomize this item, such that it reflects whether an individual is interested in politics or not. The second measure captures whether individuals participate in political parties, local politics, or citizens' initiatives. The third measure indicates whether individuals engage in volunteer work in clubs, associations, or social services. Both activities capture different forms of political participation: Engagement in political parties and alike is considered as formal political participation, whereas volunteering is regarded as civic engagement (Talò and Mannarini, 2015). Civic engagement is a latent form of political participation and refers to activities aiming at improving society.

Lastly, SOEP respondents also indicate whether they lean toward a specific political party and, if so, to which one. Respondents could name several parties that they tend to support. In contrast to the electoral data, these stated party preferences are available for all years, not just the election years. Additional variables capture socio-demographic characteristics such as respondents' age, marital status, monthly net household income, unemployment status, and educational attainment. Based on the CASMIN classification, we categorize individuals with tertiary education as highly educated. Those still in school, without a secondary school degree or basic vocational education only are considered as having a low level of education.

4.4 Further Information From Other Data Sources

To control for regional economic development, we incorporate additional data sources. First, daytime satellite data from Lehnert et al. (2023b) provide information about the land cover composition of geographical areas. As some surface types are more closely linked to economic activities than others, such data predict local GDP (Lehnert et al., 2023a). Following the authors’ recommendation, we control directly for the log-transformed surface shares to minimize prediction-induced noise. Secondly, we add data on county-level unemployment. Rupieper and Thomsen (2025) provide newly digitized county-level unemployment series that extend beyond the period available in digital form from the German Federal Employment Agency (Bundesagentur für Arbeit, 2005). As the electoral data and the survey data cover different years, the values for these regional controls differ between both datasets (see Tables 4 and 5 in the appendix).

5 Empirical Approach

5.1 Identification Strategy

Electoral Data. To identify the effect of VHS education on election outcomes, we use the county-level electoral dataset and estimate the following two-way fixed effects panel model by OLS:

$$y_{ct} = \alpha + \beta \times courses_{c,t-1} + D_c + D_t + X'_{c,t-1}\delta + \epsilon_{ct}, \quad (1)$$

where y_{ct} is the election outcome of interest in county c and year t . α denotes a constant. The parameter of interest, β , captures the marginal effect of an additional VHS course per thousand inhabitants and reflects the average effect of treatment on the treated (ATT). Because courses take place throughout the year, we use the lagged number of courses so that only completed courses can affect outcomes. D_c denotes county fixed effects, which control for unobservable county characteristics that are constant over time. The inclusion of county fixed effects means that we estimate within-county changes. D_t denotes year fixed effects that absorb year-specific shocks common to all East German counties. The vector X_{ct} comprises lagged regional control variables, including population density, the share of unemployed persons in the county population, and logarithmized surface shares to proxy GDP. Following the design component argument from Abadie et al. (2023), we cluster standard errors at the county level.

Survey Data. To estimate the effect of VHS education on political attitudes and participatory behaviors, we use the individual-level survey dataset from the SOEP and estimate the following two-way fixed effects panel model by OLS:

$$y_{ict} = \alpha + \beta \times courses_{c,t-1} + D_i + D_t + X'_{c,t-1}\gamma + X'_{it}\delta + \epsilon_{ict}, \quad (2)$$

where y_{ict} is the outcome of interest of individual i living in county c in year t . α denotes a constant. The parameter of interest, β , captures the marginal effect of an additional VHS course per thousand inhabitants on individual-level outcomes in the following year. As we cannot track actual participation, only individuals' exposure to VHS courses, β identifies an intention-to-treat (ITT) effect. This parameter averages the effect of additional VHS courses among all individuals, regardless of their actual participation. Scaling with participation probability enables the calculation of ATT effects (similar applications can be found in Havnes and Mogstad, 2011; Bettinger et al., 2012). As individual's participation probability is unobservable, we approximate it by dividing the county-level number of enrollments in courses by county population. Since this measure neglects that individuals may participate in several courses, the ATT estimates reflect an upper-bound estimate of the marginal effect of course participation.

D_i denotes individual fixed effects, which control for unobservable, time-invariant personal characteristics. These capture the time-invariant part of the propensity to participate in adult education as well as the time-invariant part of political attitudes and participatory behaviors. Controlling for person-fixed effects implies that we estimate within-individual changes. D_t denotes year fixed effects, which absorb year-specific shocks common to all East Germans. In addition to the regional controls X_{ct} already introduced in the previous section, we also control for a set of observable individual-level characteristics. Empirical studies have shown that age, marital status, income, educational attainment, and employment status are consistently linked to participation in adult education and political participation (see for example Desjardins et al., 2006; Desjardins, 2020; Smets and van Ham, 2013). Therefore, the vector X'_{it} includes age in years, logarithmized monthly net household income, and indicators for educational attainment, marital status, and unemployment. Again, standard errors are clustered at the county level.

5.2 Plausibility of the Identification Assumption

Identifying the causal effects of VHS education on political attitudes and participatory behavior requires that local VHS course availability be exogenous with respect to our outcomes of interest. To assess the validity of this identifying assumption, we test for associations between course availability in 1991 (the first data for which VHS data are available), and pre-treatment outcomes and covariates. Ideally, one would expect no significant associations between treatment allocation and pre-treatment outcomes and covariates. Because of the quasi-natural design used in this study, we lack a clear pre-treatment period. The closest proxy is the 1990 data. Although we lack data on the educational activities of East German VHS in 1990, the described historical circumstances suggest that they were comparatively low.

We therefore use the results of the 1990 federal election to assess their association with

subsequent VHS course availability. Using the regional dataset, we estimate the following model by OLS:

$$courses_{c,1991} = \alpha + \beta \times Y_{c,1990} + \epsilon_{ct}, \quad (3a)$$

where $courses_{ct}$ denotes the number of VHS courses per thousand inhabitants in county c and year t , α is the constant, and Y_{ct} is a vector of federal election outcomes. Standard errors are clustered at the county level.

The 1990 SOEP survey wave best represents individuals' pre-treatment situation. To assess whether individual-level traits are associated with subsequent course availability, we estimate the following model by OLS:

$$courses_{c,1991} = \alpha + \beta \times Y_{ic,1990} + \gamma \times X_{ic,1990} + \epsilon_{ct}. \quad (3b)$$

The dependent variable, constant, and standard errors are defined as above. Y_{ict} is a vector containing individual i 's political attitudes and participation, which constitute our outcomes of interest in the main analysis. X_{ict} is a vector of individual i 's socio-demographic characteristics, which serve as covariates in the main analysis.

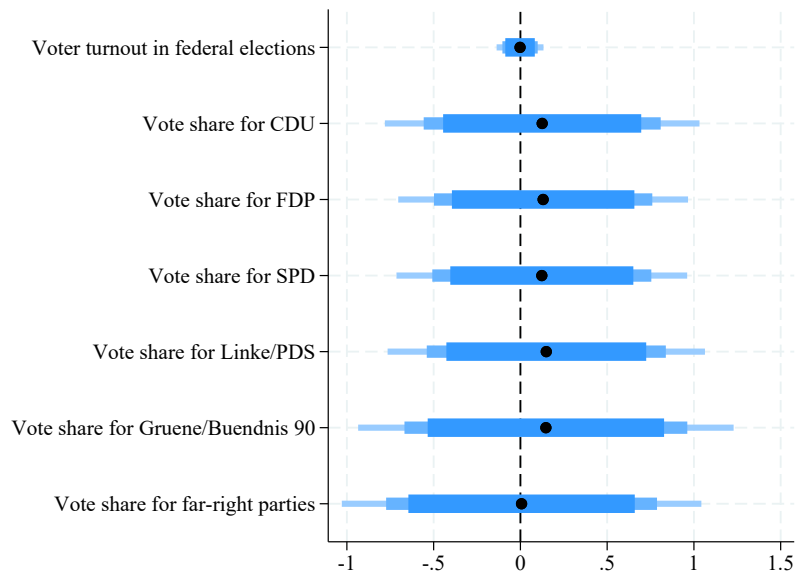
For both datasets, we test whether the estimates of β and, if applicable, γ are significantly different from zero. Such significant associations would hint at patterns of self-selection, thereby violating the exogeneity assumption. Furthermore, we test whether the included variables are jointly predictive of subsequent course availability, which could indicate reverse causality.

Figure 3 presents the results of this exercise. Panel (a) reports results based on the electoral data, showing that none of the 1990 federal election outcomes are significantly associated with the subsequent availability of VHS courses in 1991. All point estimates are close to zero and statistically indistinguishable from it. A joint significance test indicates that, even taken together, these variables do not significantly predict later course availability (p-value: 0.796). This suggests that neither turnout nor the electoral success of specific parties in the 1990 federal election explains the subsequent expansion of VHS courses. Table 6 in the appendix reports detailed estimation results.

Panel (b) of Figure 3 reports results based on the individual-level survey data from the SOEP. None of the pre-treatment outcomes are significantly associated with subsequent course availability. The same holds for the majority of covariates, with the exception of high educational attainment. Holding a tertiary degree in 1990 is associated with a greater exposure to VHS courses in the following year by 0.099 additional courses per thousand inhabitants (significant at the 5 % level). However, in all later years, this correlation is close to zero and no longer statistically significant (see Figure 9 in the appendix). This could indicate that limited availability of qualified teachers constrained the initial expansion of VHS courses. To address this, we control for educational attainment in the individual-level analysis. A test of joint significance (p-value: 0.462) indicates that the pre-treatment

Figure 3: Correlation of Pre-Treatment Outcomes with Course Availability in 1991

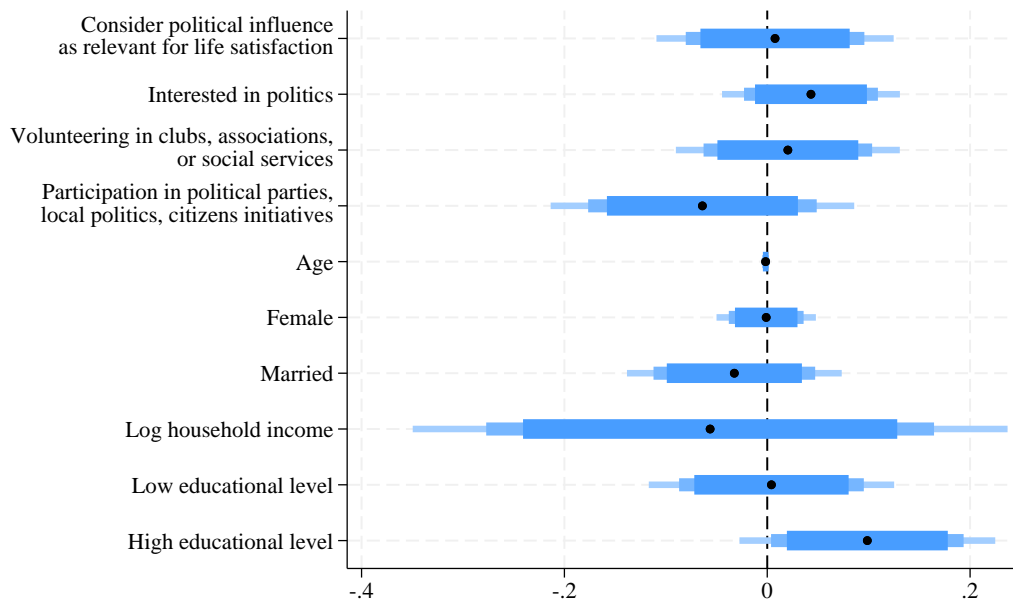
(a) Electoral Data



Data Sources: Heddeshheimer et al. (2025), VHS statistic, BBSR.

Notes: The figure shows the associations of pre-treatment outcomes with subsequent availability of VHS courses. Standard errors are clustered at the county level. Confidence intervals are shown at the 90, 95, and 99 % levels. The p-value of the joint significance test is 0.796, indicating that, taken together, these variables are not significantly associated with subsequent course availability.

(b) Survey Data



Data Sources: SOEP v39, VHS statistic, BBSR.

Notes: The figure shows the associations of various pre-treatment outcomes and socio-demographic characteristics with subsequent availability of VHS courses. Note that not all outcome variables used in our analysis were included in the 1990 East German questionnaire. Standard errors are clustered at the county level. Confidence intervals are shown at the 90, 95, and 99 % levels. The p-value of the joint significance test is 0.462, indicating that, even jointly, these variables are not significantly associated with subsequent course availability.

outcomes and covariates have no significant, joint effect on subsequent course availability. Table 7 in the appendix reports the estimation results in detail.

Overall, these findings indicate that the availability of VHS courses is exogenous with respect to the outcomes considered in this study. The absence of consistent evidence on self-selection supports the plausibility of the identifying assumption and strengthens confidence in its validity. We find no evidence that local VHS availability is shaped by regional political factors. For potential participants, course availability appears to be as good as random and orthogonal to their political attitudes and behaviors.

6 Results

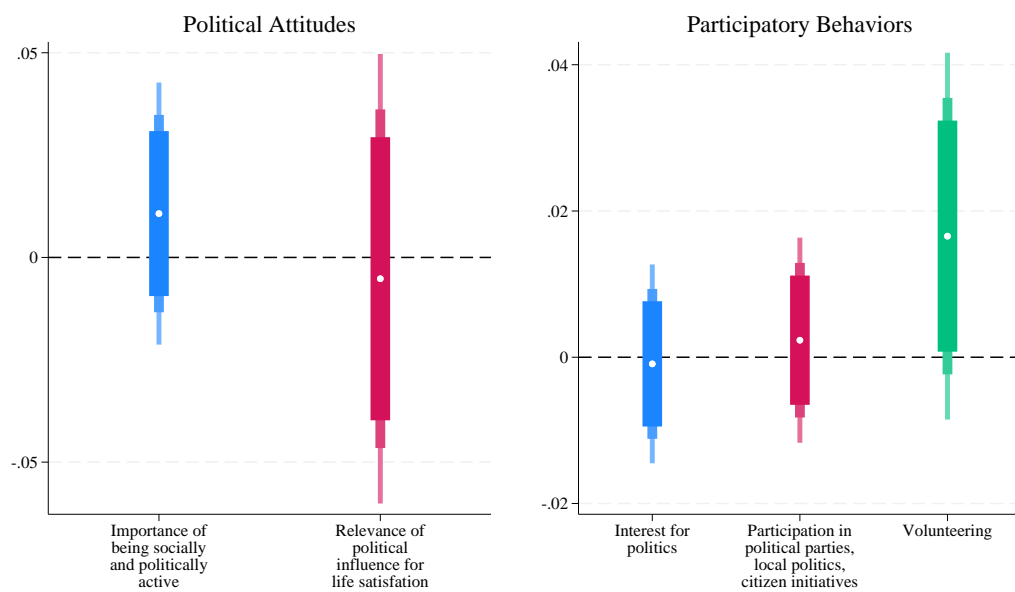
6.1 The Effect of VHS Education on Political Participation

To test our first hypothesis, we estimate the effect of exposure to VHS courses for a set of outcome variables that capture political attitudes and participatory behaviors. Following the standard model, we expect adult education to affect political participation but not political attitudes. Finding significant changes in political attitudes would instead point to the socialization mechanism. Figure 4 summarizes the main findings regarding individual-level political attitudes and participation (see Table 8 in the appendix for detailed estimation results). Table 1 reports the results for county-level voter turnout.

Firstly, we find no significant effects of exposure to VHS courses on individuals' political attitudes. Being exposed to an additional VHS course per thousand inhabitants is found to increase the probability that an individual considers being socially and politically active as important by 1 percentage point, corresponding to an increase of 8 % relative to the baseline value. This effect is, however, statistically insignificantly different from zero. For the second attitudinal item, exposure to an additional VHS course per thousand inhabitants is found to reduce the probability that an individual considers political influence as relevant for their life satisfaction by 1 percentage point, corresponding to a reduction of 1 % relative to the baseline value. Also this estimate is statistically insignificant. Overall, these results suggest that exposure to VHS courses does not change adults' political attitudes. Yet, these attitudinal items were surveyed only in a limited number of waves, reducing sample size and statistical power.

Next, our findings regarding political participation are mixed. Exposure to an additional VHS course per thousand inhabitants has no significant effect on political interest. Also for participation in political parties, local politics, and citizens' initiatives, we find no significant effect. In contrast, exposure to an additional VHS course increases the probability of volunteering by 2 percentage points. This estimate is statistically significant at the 10 % level and corresponds to an increase of 6 % relative to the baseline value. Taking the average participation probability into account allows the estimation of ATT effects, suggesting

Figure 4: Effect of VHS Education on Political Attitudes and Participatory Behaviors



Data Sources: SOEP v39, VHS statistic, BBSR, Rupieper and Thomsen (2025), Bundesagentur für Arbeit (2005), Lehnert et al. (2023b).

Notes: The figure shows the estimated marginal effect of being exposed to an additional VHS course per thousand inhabitants on various individual-level measures of political attitudes and participation. Note that outcomes were included in varying numbers of survey waves. Standard errors are clustered at county level. Confidence intervals are shown at the 90, 95, and 99 % levels.

significant increases of 52 percentage points among actual course participants. Furthermore, we find a significant reduction of turnout in federal elections by 0.55 percentage points (significant at the 5 % level, see Table 1).

Table 1: Effects of VHS Courses on Voter Turnout in Federal Elections

	Turnout in federal elections				
	(1)	(2)	(3)	(4)	(5)
Course exposure	0.82*** (0.17)	0.89*** (0.32)	-0.66** (0.27)	-0.53* (0.29)	-0.55** (0.27)
Population density					0.01* (0.01)
Unemployed population share					0.19** (0.08)
County FE		✓	✓	✓	✓
Year FE			✓	✓	✓
Surface shares				✓	✓
R^2	0.06	0.47	0.83	0.84	0.85
Adj. R^2		0.21	0.74	0.75	0.76

Data Sources: Heddeshimer et al. (2025), VHS, BBSR, Rupieper and Thomsen (2025), Bundesagentur für Arbeit (2005), Lehnert et al. (2023b).

Notes: Table reports the estimated effect of an additional VHS course per thousand inhabitants on voter turnout in the federal elections of 1994, 1998, and 2002. Standard errors are clustered at the county level. N = 225.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

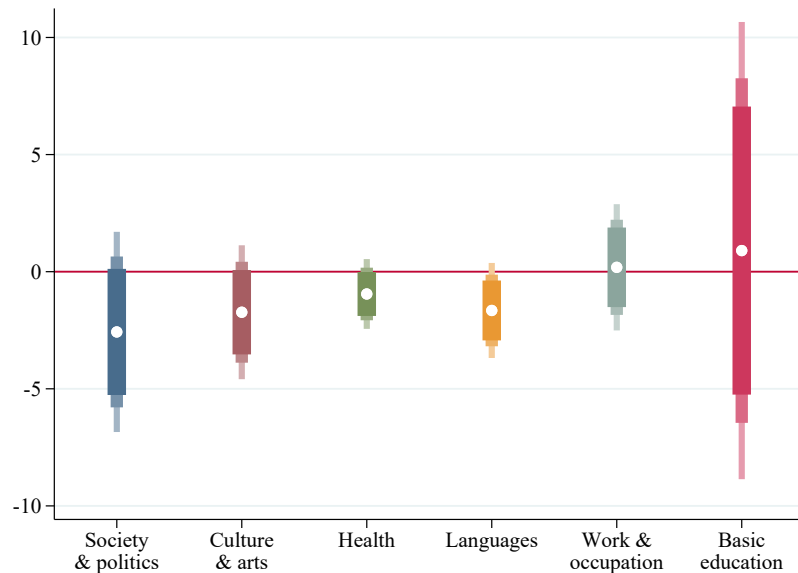
In line with our first hypothesis, we find that VHS courses can affect political participation, but do not change political attitudes. We find no evidence for the socialization mechanism. Instead, our results suggest that adult education affects political participation by conveying relevant skills and knowledge, as described by the standard model. However, effects are not uniform across participatory behaviors: While VHS courses increase volunteering, they decrease turnout in federal elections. Participation in local politics and political interest remain unaffected. We discuss potential reasons for this effect heterogeneity in the concluding section 7.

6.2 Civic Education

To assess whether civic education has a larger effect on participatory behaviors than courses on other topics, we distinguish VHS courses by content and separately estimate their effects on participatory behaviors. First, we consider turnout in federal elections. As displayed in Figure 5, an additional course on society & politics per thousand inhabitants decreases voter turnout by 2.57 percentage points. This estimate is statistically insignificantly different from zero. For most other course areas, associations are small, negative and

close to zero. Only language and health courses significantly decrease turnout at the 95 and 90 % levels, respectively. For work & occupation and basic education, we find small positive associations with voter turnout, which remain, however, statistically insignificant. Table 9 in the appendix presents the detailed estimation results.

Figure 5: Effect of VHS Courses on Turnout by Subject



Data Sources: Heddesheimer et al. (2025), VHS statistic, BBSR, Rupieper and Thomsen (2025), Bundesagentur für Arbeit (2005), Lehnert et al. (2023b).

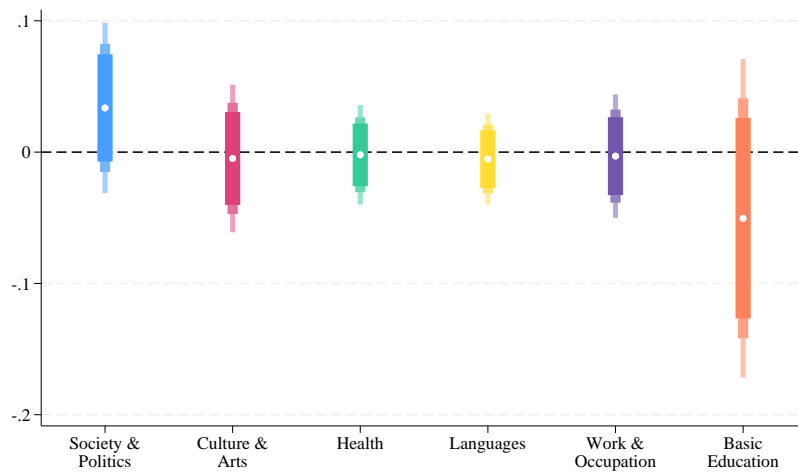
Notes: Standard errors are clustered at county level. Confidence intervals are shown at the 90, 95 and 99 % level.

Also at the individual level, we find no significant effect of society & politics courses on any of the considered participatory behaviors, that is political interest, participation in local politics, and volunteering (see Figure 6). The same holds for courses on most other topics. Only health courses are found to significantly affect political participation: Being exposed to an additional health course per thousand inhabitants increases the probability to participate in political parties, local politics, or citizens' initiatives by 3 percentage points (significant at the 5 % level). Furthermore, an additional health course per thousand inhabitant increases the probability of volunteering by 4 percentage points (significant at the 10 % level). These positive effects may hint to improved physical abilities and well-being, changes in social networks, or increased social capital and trust. Table 10 in the appendix presents the detailed estimation results.

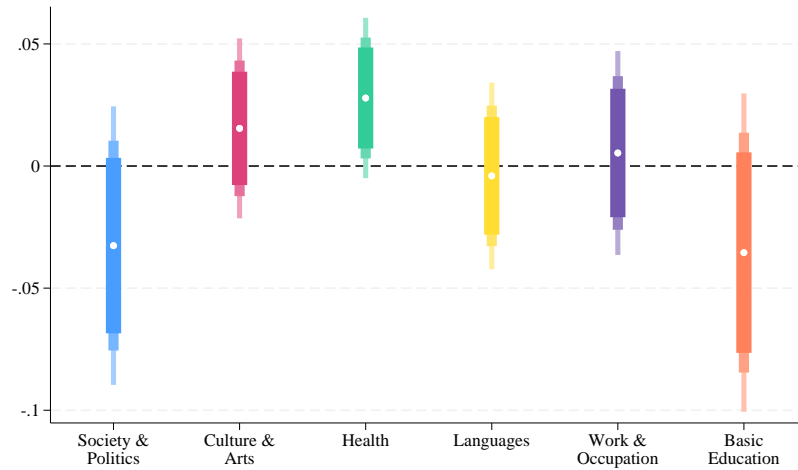
Overall, the results suggest that society & politics courses do not drive the observed effects of VHS courses on political participation. If anything at all, effects are rather driven by courses on health topics, and to some extent, language courses. We therefore reject our second hypothesis that civic education has larger effects on participatory behaviors than those of courses on other topics. It may be the case that society & politics courses depart too much from civic education. Alternatively, the null results may reflect limited

Figure 6: Effect of VHS Courses on Individuals' Participatory Behaviors by Subject

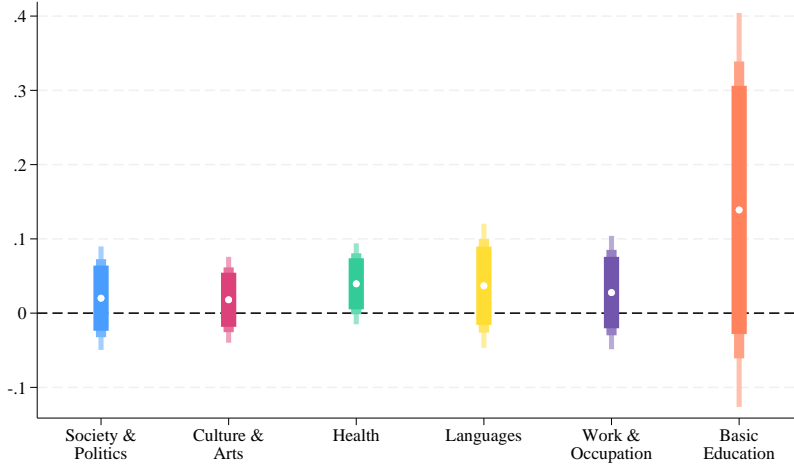
(a) Interest for Politics



(b) Participation in political parties, local politics, or citizens' initiatives



(c) Volunteering in clubs, associations, or social services



Data Sources: Soep v39, VHS statistic, BBSR, Rupieper and Thomsen (2025), Bundesagentur für Arbeit (2005), Lehnert et al. (2023b).

Notes: Standard errors are clustered at county level. Confidence intervals are shown at the 90, 95 and 99 % level.

statistical power inherent in the disaggregated perspective.

6.3 Partisanship

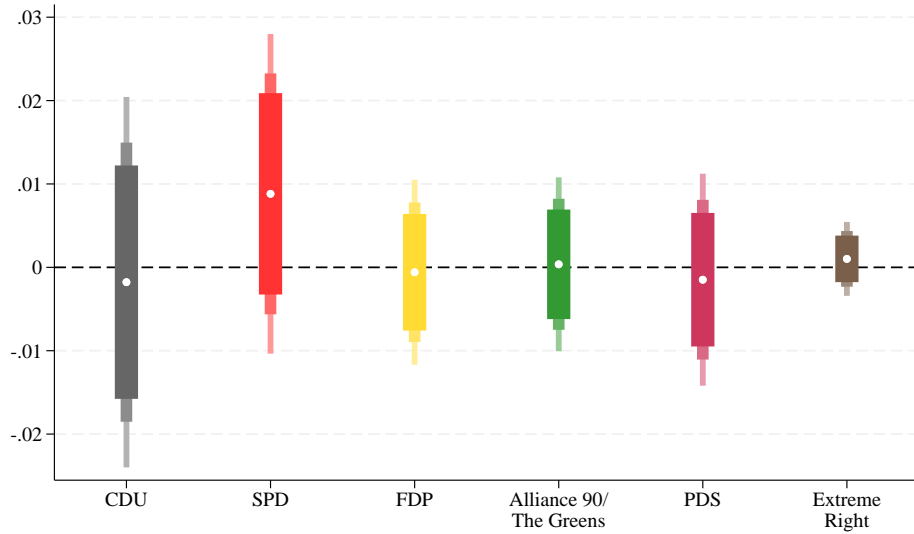
To inspect whether VHS education affects party support, we estimate the marginal effect of an additional course per thousand inhabitants on individuals' party preferences stated in the SOEP surveys. However, respondents may prefer not to reveal their true preferences to an interviewer. We therefore also estimate the effect of VHS education on party preferences as revealed in federal elections. Both, stated and revealed party preferences, are important outcomes to examine, as they directly influence political outcomes in a democracy and may inform us about the preference formation of the electorate.

Figure 7a shows the marginal effect of an additional VHS course per thousand inhabitants on individuals' stated party preferences (see Table 11 in the appendix for the detailed regression estimates). For all parties, we find effects that are very close to zero and insignificantly different from it, indicating that exposure to VHS education does not change individuals' probability of supporting a specific party. Information about stated party preferences is available on an annual basis. Elections, however, take place every four years only. To ensure the comparability of the results, we redo the individual-level analysis by limiting it to election years only. As Figure 11 in the appendix shows, the estimation becomes less precise in this exercise but confirms the previous null-results.

Figure 7b turns to revealed party preferences instead and displays the marginal effect of an additional VHS course per thousand inhabitants on parties' vote shares in federal elections. We find no significant effect of VHS education on the vote shares of most parties,

Figure 7: Marginal Effect of VHS Courses on Partisanship

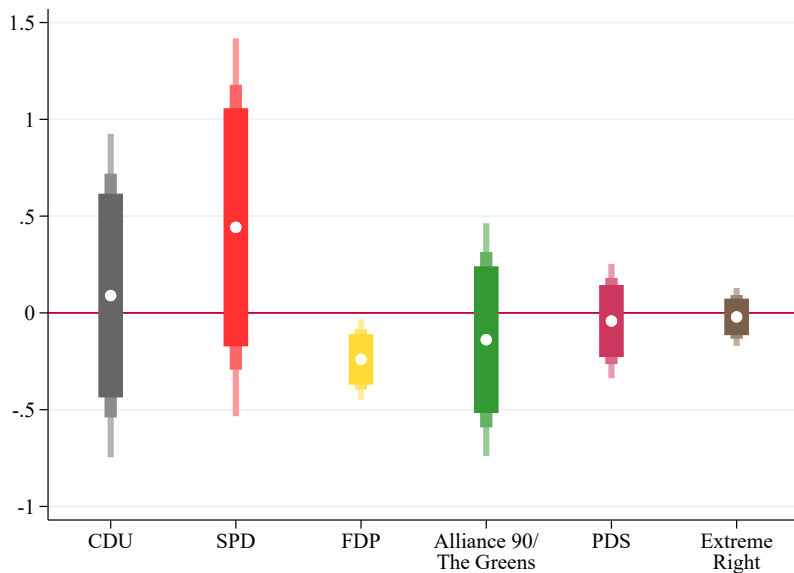
(a) Individuals' Probability of Supporting a Specific Party



Data Sources: SOEP v39, VHS statistic, BBSR, Rupieper and Thomsen (2025), Bundesagentur für Arbeit (2005), Lehnert et al. (2023b).

Notes: Figure shows the effect of an additional VHS course per thousand inhabitants on the probability of supporting a specific party, controlling for individual characteristics, spatial characteristics, person and year fixed effects. Standard errors are clustered at county level. Confidence intervals are shown at the 90, 95 and 99 % level.

(b) Parties' Vote Share in Federal Elections



Data Sources: Heddesheimer et al. (2025), VHS, BBSR, Rupieper and Thomsen (2025), Bundesagentur für Arbeit (2005), Lehnert et al. (2023b).

Notes: The figure shows the estimates of a regression model controlling for spatial characteristics, county fixed effects and year fixed effects. Standard errors are clustered at county level. Confidence intervals are shown at the 90, 95 and 99 % level. Federal elections took place in the years 1994, 1998, and 2002.

including the left-wing PDS and far-right parties. In contrast, an additional VHS course per thousand inhabitants is found to reduce the vote share of the liberal FDP by 0.25 percentage points. This effect is highly significant at the 1 % level and corresponds to a 1.79 % decrease relative to the FDP’s vote share in the 1990 federal election (see Table 12 in the appendix).

Differences between the results on stated and revealed preferences may result from differences in the composition of the considered electorate. Our SOEP sample considers only those East Germans that already lived there in 1989, that is before the German reunification. The electoral data, however, inform about the electoral behavior of all East Germans, including West Germans who had migrated to the East after the reunification. Selective migration patterns or heterogeneous effects of VHS education may explain divergent results. Alternatively, and more likely, the divergent results may indicate differences in the voter mobilization. Electoral success requires not only sympathy towards a party, but also voter mobilization. This may have mattered especially in East Germany, where parties are less enrooted than in West Germany for historical reasons (see, for example, Mau, 2024). It may have been the case that the FDP’s mobilization strategy did not benefit as much from the expansion of VHS education as those of other parties.

Overall, we find no consistent evidence that adult education provided by VHS affects partisanship. The only exception is the FDP: While stated party support remains unaffected, VHS courses significantly reduce their vote share. More importantly, our results indicate that VHS education does not reduce support for anti-democratic parties. Consequently, we reject the third hypothesis, which aligns with the null-results on the previously studied dimensions of political attitudes.

6.4 Robustness Checks

We conduct additional analyses to inspect the robustness of the results. To this aim, we vary the definition of the treatment variable, use an alternative operationalization of the outcome variables, and add additional controls to the specification. For brevity, we summarize the findings here and provide detailed estimation results in the appendix.

Accumulated courses. Firstly, we vary the operationalization of the treatment variable. Instead of lagged course availability, it may also be the case that accumulated exposure to VHS courses matters for changing political attitudes and behaviors. We therefore redo our analysis and estimate the effect of accumulated exposure on outcomes. We replicate our previous null results (see Table 13 in the appendix). However, when using accumulated exposure instead of lagged course exposure, the effect of VHS courses on volunteering in clubs, associations, and social services becomes smaller and insignificant. The same holds for the effect of VHS education on voter turnout (see Table 14). In addition, the formerly negative effect on the FDP’s vote share becomes insignificant (see Figure 12).

These findings imply that recent experiences are more important in determining political participation and partisanship than those that are temporally more distant, suggesting a fading effect of adult education on political participation.

Enrollment numbers. Second, we vary our measurement of course availability by using the number of enrollments per thousand inhabitants instead of the number of courses per thousand inhabitants. Given the strong correlation between courses and enrollment numbers, we expect similar results. This exercise replicates the effects on parties' vote shares (see Figure 13) and the previous null results on the attitudinal items, political interest, and participation in political parties. But the formerly positive effect on volunteering now becomes insignificant (see Table 16). The effect on turnout becomes much smaller, but remains statistically significant at the 5 % level (see Table 15). This may hint at limits in the statistical power of the analysis, as an additional participant constitutes a much weaker treatment than an additional course, which consists of 12 participants on average (authors' calculations).

Likert-scaled outcomes. Third, we vary the operationalization of several outcome variables in the survey data. Given our dichotomization of several variables, we additionally test whether using their original Likert-scaled versions yields similar results. We restrict this analysis to the ordinal-scaled outcomes where the interpretation of such regression estimates remains meaningful, that is the attitudinal items and individuals' interest in politics. As presented in Table 17 in the appendix, also this exercise replicates the null-results from the main analysis.

Local subsidies. The last group of robustness checks targets endogeneity concerns. Our identification strategy assumes that course availability is orthogonal to political attitudes, behaviors, and partisanship. Omitted variables may undermine that assumption if they influence both course availability and political participation. Controlling for daytime satellite data and various fixed effects reduces the probability of such an omitted variable bias. However, we run additional tests to check the robustness of our results. Local economic activity, for example, may influence both participatory behaviors and subsidies paid to VHS. If local subsidies drive the expansion of VHS courses, this would undermine the exogeneity assumption. Therefore, we additionally control for the logarithmized subsidies paid to VHS by local political bodies, meaning the county and the municipalities. Reassuringly, the estimation results are identical to those of our main analysis (see Tables 18 and 19 and Figure 14 in the appendix).

County fixed effects. Lastly, we additionally estimate the individual-level specifications with additional county fixed effects. These absorb time-constant variation specific to individual counties. Again, the estimation results are identical to the findings of the main analysis (see Table 20 in the appendix).

7 Discussion

Especially in times of political change, it is crucial to understand the effect of adult education on political participation, attitudes, and partisanship. This paper provides empirical evidence on this question, using administrative education data, comprehensive individual-level panel data, and official county-level electoral data. Quasi-random variation in course availability, induced by the expansion of adult education courses provided by VHS in East Germany after reunification, enables the identification of causal effects.

Firstly, our results suggest that adult education affects political participation by conveying relevant skills and knowledge, not by shifting political attitudes. This implies, in the terms of Willeck and Mendelberg (2022), that the so-called standard models provide a fitting framework for understanding the effects of voluntary, non-formal adult education on political participation. Political socialization or status gains, as suggested by the competing socialization models and proxy theories, seem to matter less. However, the relation between education and political participation is more complex than commonly depicted. While adult education provided by VHS is found to increase civic engagement in the form of volunteering, we find negative effects on formal political participation in the form of voter turnout. Other participatory behaviors, namely political interest and participation in local politics, remain unaffected.

This complex relation can be better understood when viewing citizens as utility-maximizing agents, following a *Homo Oeconomicus* explanation of behavior. In line with this perspective, the question of whether education increases political participation can be framed as an effort-allocation problem between different activities. Campante and Chor (2012), for example, distinguish between production and non-production activities and classify political participation as a non-production activity. For decisions on the margin, individuals trade off the utility gains of putting effort into a non-production activity against the opportunity cost of forgone production income. As education expands individuals' capacity to process information and execute tasks, it typically increases productivity in both production and non-production amenities. Consequently, rational citizens expand effort in both spheres. How much, and whether, non-production efforts rise relative to production efforts depends on the human capital intensity, marginal utility, and opportunity cost of the specific participatory behavior. This perspective may not only explain the opposing effect directions found for turnout and volunteering, but also the mixed and context-dependent results from the related literature on school education.

Secondly, against our expectations, the results suggest that civic education does not drive the effects of adult education on political participation. We find that courses on the topics of society & politics have no larger effects on political participation than courses on other topics. One explanation may be that VHS courses on society & politics diverge from civic education in relevant aspects. To effectively raise civic and political engagement, civic

education not only has to teach relevant knowledge and skills, but also requires an open classroom climate, the development of students' critical consciousness, and active learning, especially service learning¹² and experiential learning (see, for example, Campbell, 2019; Willeck and Mendelberg, 2022). Some courses falling in the realm of society & politics may not have fulfilled all these criteria. Lastly, besides teaching relevant knowledge and skills, civic education typically also aims to convey civic norms. Such socialization aspects may be harder to achieve with adult learners. It may be that civic education is more effective for younger learners.

Thirdly, we find no evidence that VHS education affects partisanship by shifting political support or votes. The only exception is the FDP, for which we find small negative effects on vote shares, but insignificant effects on stated party support. These divergent results highlight that electoral success requires not only citizens' sympathy for a party, but also voter mobilization. A negative effect on the FDP's vote share was also found by Martin and Reichart (2020), who estimate the association between VHS education and parties' vote share in the 2013 federal election. Furthermore, they find significant associations for the majority of political parties and a positive correlation with voter turnout. In contrast to our study, Martin and Reichart (2020) focus on courses on society & politics only, whereas we look at both the effect of VHS education overall and the effect of specific courses. The region and time period of interest also differ. Lastly, our study improves the internal validity of the existing evidence, as our identification strategy relies on a natural experiment.

Although VHS have the reputation of fostering democracy, our results suggest that their courses do not reduce support for anti-democratic parties. If VHS foster democracy, it is not via partisanship. However, our evaluation is limited to a specific set of individual-level attitudes and participatory behaviors. There may be further, relevant democratic attitudes beyond those covered in this paper. In addition, this paper does not cover mechanisms located at the meso and macro levels, including institutional ones. For example, adult education centers like VHS may constitute an important component of democratic societies as they provide easily accessible education, enable lifelong learning, and foster societal participation across socio-demographic groups, thus supporting meritocratic ends. But VHS may also matter by providing a platform for discussion and exchange, analogously to a Roman forum or a Greek agora.¹³ In the social sciences, such informal gathering places are also referred to as "third places", in addition to the primary and secondary places of home and work (Oldenburg and Brissett, 1982). Gatherings at third places are typically unplanned and transcend distinctions of status, class, and race. They thereby foster

¹²Service learning combines opportunities to engage in meaningful service activities in respective communities with reflection and academic learning (see, for example, p. 101f in Willeck and Mendelberg, 2022).

¹³We study a time period in which public discourse was still predominantly analog. Digital discourses often exhibit a distinct inherent logic, which may limit the transferability of our results to the present.

community and civility (Oldenburg, 2023), ease the building of social capital (Putnam, 2000) and reduce structural factors of loneliness (Barreto et al., 2024).

Given the strong context-dependency of both education decisions and political participation, we caution against a blind generalization of these findings. Even courses at West German VHS may have had different impacts, as political differences between East and West Germany prevail. Besides differences in party perception and political participation, parties in East Germany matter less for local politics and are less enrooted compared to West Germany (Mau, 2024). Further aspects relevant for the transferability of our results include political and institutional landscapes, legal voting systems, and democratization experiences. Furthermore, our results suggest that mechanisms and effects vary across different forms of education. They may be more pronounced for more intense educational measures compared to the mostly weekly VHS courses. Voluntary participation and the cohort composition may be further, critical aspects. In addition, younger participants are shown to be more susceptible to political socialization (see, for example, Cantoni et al., 2017).

While our results show that adult education affects some forms of political participation, they also highlight the complexity of this relation, emphasizing the need for a more nuanced understanding of the varied ways in which education affects political behavior. To this aim, research would benefit from broadening its perspective and considering more forms of political participation besides turnout. Qualitative, theory-based classifications of participatory behaviors such as the one provided by Talò and Mannarini (2015) may provide orientation. Their distinction between disengagement, civil engagement, formal political participation, and activism may provide a helpful starting point for empirical researchers. The majority of the existing research, including this study, focuses on quantitative measures of education, such as years of schooling, student or course numbers. However, these measures often veil important characteristics of education like quality, content, applicability, or instruction mode. Similarly to the previous point, our understanding of the nexus between education and political participation would benefit from broadening this perspective using theory-based, qualitative distinctions of education. The increase of digital teaching methods, big data, and natural language processing may ease following such an approach. Future research may also benefit from more rigid causal evaluations, for example by exploiting natural experiments or implementing randomized field experiments in collaboration with educational providers. A better understanding of the context-dependency of the effect of education on political participation is equally important: What exactly are the contextual factors that determine the direction and size of the effect of education on political participation? Explanations based on marginal utility, opportunity cost, and human capital intensity of specific participatory behaviors may be useful for this purpose.

Our findings have important policy implications: They show that adult education can

be an important tool for influencing citizens' political participation. However, this nexus is complex and shaped by context. Adult education increases political participation when it makes efforts in this realm more efficient and attractive relative to efforts in competing areas. Yet, it should be noted that effort is not synonymous with participation - it could also manifest in deliberate disengagement (see, for example, Croke et al., 2016). Given the importance of civic returns to adult education, one may also scrutinize whether e-learning constitutes a desirable instruction mode at all. If learning shifts to digital places, the building of social capital may be hampered or left to happen within social bubbles.

While the idea that education fosters democracy proves quite persistent, it has become obvious that it also is a simplistic view of a complicated matter. Although often rashly claimed, education is not a panacea for fostering democracy and raising political participation. Instead, we can only understand the overall effect of education on political participation when we understand its effects on other areas of life, highlighting the interplay of the production and political roles of human capital.

Declarations

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Data Availability: The sensitivity of the data prohibits its public sharing. However, the VHS statistic, provided by the German Institute for Adult Education, is available upon application via <https://www.die-bonn.de/weiterbildung/statistik/auswertungsservice>. The SOEP-Core Remote Edition augments the standard SOEP data with information about the county of residence and can be accessed in secure data environments upon application to DIW Berlin. All remaining data are publicly available from the cited sources. Replication code is available from the corresponding author upon request.

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Appendix: Tables

Table 2: Course Availability

Mean number of VHS courses per thousand inhabitants	
In 1991	1.34
... 1992	1.74
... 1993	2.03
... 1994	2.28
... 1995	2.51
... 1996	2.79
... 1997	3.06
... 1998	3.15
... 1999	3.28
... 2000	3.44
... 2001	3.56

Data Sources: VHS, BBSR.

Notes: Table shows the mean number of VHS courses per thousand inhabitants among East German counties. Sample: County-level information on all East German VHS between 1991 and 2001.

Table 3: Funding of VHS

	Share of Budget (in %)
Raised from SGB funds	6.98
Raised from federal funds	0.86
Raised from EU funds	1.56
Raised from other funds	3.21
Subsidies paid by local authorities	27.77
Subsidies paid by federal state	25.04
Participation fees	34.59
N	820

Data Sources: VHS, BBSR.

Notes: Table shows the average share of various funding sources in the budget of East German VHS. Local authorities encompass the county and municipalities. The sample is limited to East German VHS during the expansion period (1991-2001) and consists of county-year observations.

Table 4: Electoral Data - Summary Statistics

	Mean	SD	Min.	Max.
<u>Educational Activities of VHS</u>				
VHS courses	2.94	1.37	0.65	9.02
Courses on society & politics	0.21	0.17	0.00	0.88
Courses on culture & arts	0.47	0.33	0.03	1.92
Courses on health	0.59	0.51	0.01	4.01
Courses on languages	0.99	0.53	0.30	4.01
Courses on work & occupation	0.60	0.27	0.16	2.28
Courses on basic education	0.08	0.10	0.00	0.71
Course enrollments	35.50	16.59	9.04	149.24
<u>Outcomes in Federal Elections</u>				
Voter turnout in federal elections	73.65	4.90	61.80	84.97
Vote share for CDU	31.36	8.40	14.37	59.06
Vote share for FDP	4.42	1.65	1.75	8.89
Vote share for SPD	37.15	7.25	17.48	52.23
Vote share for Linke/PDS	18.52	3.80	8.83	30.80
Vote share for Gruene/Buendnis 90	3.88	1.39	2.12	10.28
Vote share for far-right parties	2.67	1.93	0.59	8.23
<u>Regional Controls</u>				
Population density	295.54	399.96	43.30	2,148.57
Unemployed population share	8.84	2.33	1.19	19.17
Share of county covered with builtup	0.17	0.09	0.05	0.48
Share of county covered with cloud	0.00	0.00	0.00	0.02
Share of county covered with crops	0.34	0.14	0.02	0.64
Share of county covered with forest	0.23	0.13	0.01	0.72
Share of county covered with grass	0.18	0.06	0.06	0.37
Share of county covered with no vegetation	0.04	0.03	0.00	0.22
Share of county covered with water	0.04	0.04	0.01	0.29

Data Sources: Heddeshimer et al. (2025), VHS, BBSR, Rupieper and Thomsen (2025), Bundesagentur für Arbeit (2005), Lehnert et al. (2023b).

Notes: Measures of the educational activities of VHS are reported as the number of courses, or enrollments, per thousand inhabitants. VHS information refers to the year before the elections. Population density is measured as the number of inhabitants per square kilometer. Sample covers all 75 East German counties in the election years of 1994, 1998, and 2002. $N = 225$.

Table 5: Survey Data - Summary Statistics

	Mean	SD	Min.	Max.	N
<u>Educational Activities of VHS</u>					
Course exposure	2.61	1.10	0	10	36,217
Participation probability (in %)	3.22	1.25	0	15	36,217
Exposure to courses on society & politics	0.20	0.17	0	1	36,217
Exposure to courses on culture & arts	0.40	0.27	0	2	36,217
Exposure to courses on health	0.44	0.40	0	4	36,217
Exposure to language courses	0.90	0.40	0	4	36,217
Exposure to courses on work & occupation	0.59	0.25	0	3	36,217
Exposure to courses on basic education	0.07	0.08	0	1	36,217
<u>Political Participation</u>					
Participation in political parties, local politics, citizens' initiatives	0.09	0.29	0	1	25,529
Volunteering in clubs, associations, or social services	0.21	0.40	0	1	25,570
Interested in politics	0.31	0.46	0	1	36,152
<u>Political Attitudes</u>					
Considering being socially and politically active as important	0.13	0.33	0	1	6,190
Considering political influence as relevant for life satisfaction	0.25	0.43	0	1	8,999
<u>Party Preferences</u>					
Leaning towards CDU/CSU	0.35	0.48	0	1	12,146
Leaning towards FDP	0.03	0.17	0	1	12,146
Leaning towards SPD	0.35	0.48	0	1	12,146
Leaning towards PDS	0.19	0.39	0	1	12,146
Leaning towards Alliance 90/the Greens	0.06	0.24	0	1	12,146
Leaning towards far-right parties	0.01	0.12	0	1	12,146
<u>Socio-Demographic Characteristics</u>					
Age	49.38	17.57	19	98	36,217
Female	0.52	0.50	0	1	36,217
Married	0.63	0.48	0	1	36,217
Monthly net household income (in DM)	3,225.18	1,564.41	55	31,800	36,217
Low educational level	0.41	0.49	0	1	36,217

Table 5: Survey Data - Summary Statistics (Continued)

	Mean	SD	Min.	Max.	N
Medium educational level	0.37	0.48	0	1	36,217
High educational level	0.21	0.41	0	1	36,217
Registered as unemployed	0.14	0.34	0	1	36,217
<u>Regional Controls</u>					
County population (in thousands)	235.52	108.94	46	512	36,217
Population density	377.94	492.87	39	2,221	36,217
Unemployed population share	8.82	2.49	1	20	36,217
Share of county covered with builtup	0.19	0.11	0	1	36,217
Share of county covered with cloud	0.00	0.00	0	0	36,217
Share of county covered with crops	0.36	0.14	0	1	36,217
Share of county covered with forest	0.20	0.13	0	1	36,217
Share of county covered with grass	0.17	0.06	0	0	36,217
Share of county covered with noveg	0.04	0.03	0	0	36,217
Share of county covered with water	0.04	0.03	0	0	36,217

Data Sources: Soep v39, VHS, BBSR, Rupieper and Thomsen (2025), Bundesagentur für Arbeit (2005), Lehnert et al. (2023b).

Notes: Dataset covers East German SOEP respondents in the years 1992-2002. As some items were not asked every year in the SOEP, observation numbers vary across outcomes. Educational attainment is measured based on the CASMIN classification. Having no secondary school degree or basic vocational education only (levels 0 or 1) is denoted as low educational level. Medium educational level (level 2) are assigned to various secondary school leaving degrees. Tertiary education (level of 3) is considered as high educational level.

Table 6: Correlation of Pre-Treatment Electoral Outcomes with Course Availability

	Availability of VHS Courses	
	$\hat{\beta}$	SE
Voter turnout in federal elections	-0.002	0.051
Vote share for CDU	0.126	0.343
Vote share for FDP	0.131	0.315
Vote share for SPD	0.123	0.316
Vote share for Linke/PDS	0.149	0.345
Vote share for Gruene/Buendnis 90	0.147	0.409
Vote share for far-right parties	0.007	0.391
Wald test of joint significance	0.546	
p-value	0.796	
N	72	

Data Sources: Heddesheimer et al. (2025), VHS statistic, BBSR.

Note: The table shows the estimated association of 1991's local course availability with turnout and vote shares in the federal election of 1990. A Wald test of joint significance shows that even taken together, these variables are not significantly correlated with the local availability of VHS courses in the following year. Availability is measured by the number of VHS courses per thousand inhabitants. Coefficient and standard error of the constant are not shown. Standard errors are clustered at county level.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 7: Correlation of Individuals' Pre-Treatment Outcomes and Covariates with Later Course Availability

	Availability of VHS Courses	
	$\hat{\beta}$	SE
Considering political influence as relevant for life satisfaction	0.008	0.044
Interested in politics	0.043	0.033
Volunteering in clubs, associations, or social services	0.020	0.042
Participation in political parties, local politics, citizens' initiatives	-0.064	0.056
Age	-0.002	0.002
Female	-0.001	0.018
Married	-0.032	0.040
Log household income	-0.056	0.111
Low educational level	0.004	0.046
High educational level	0.099**	0.048
Observations	3,401	
R^2	0.004	
Wald test of joint significance	0.990	
p-value	0.462	

Data Sources: SOEP v39, VHS statistic, BBSR.

Note: Table shows the estimated association of pre-treatment outcomes and covariates as of 1990 with individuals' later course exposure in 1991. Coefficient and standard error of the constant are not shown. Standard errors are clustered at the county level.

*** p<0.01, ** p<0.05, * p<0.1

Table 8: Effect of VHS Courses on Political Attitudes and Participation

	Political Attitudes		Participatory Behaviors		
	Being socially and politically active considered important (1)	Considering political influence as relevant for life satisfaction (2)	Interested in politics (3)	Participation in political parties, local politics, citizens' initiatives (4)	Volunteering in clubs, associations, or social service (5)
Course exposure	0.01 (0.01)	-0.01 (0.02)	0.00 (0.01)	0.00 (0.01)	0.02* (0.01)
Baseline	0.13	0.44	0.49	0.16	0.27
Change relative to baseline	0.08	-0.01	0.00	0.01	0.06
ATT effect	0.33	-0.16	-0.03	0.07	0.52
N	6,190	8,999	36,152	25,529	25,570
R^2	0.78	0.66	0.68	0.58	0.62

Data Sources: VHS statistic, SOEP v39, BBSR, Rupieper and Thomsen (2025), Bundesagentur für Arbeit (2005), Lehnert et al. (2023b).

Notes: Table shows estimated marginal effect of being exposed to an additional VHS course per thousand inhabitants on various binary outcomes. All specifications control for socio-demographic characteristics, year fixed effects, person fixed effects, and regional controls. Standard errors are clustered at the county level and given in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 9: Effect of VHS Courses on Turnout by Content

	Turnout in federal elections			
	$\hat{\beta}$	SE	R^2	Mean availability
Courses on society & politics	-2.57	(1.62)	0.85	0.20
Courses on culture & arts	-1.73	(1.08)	0.85	0.41
Courses on health	-0.95*	(0.56)	0.85	0.48
Language courses	-1.66**	(0.77)	0.85	0.91
Courses on work & occupation	0.19	(1.02)	0.85	0.64
Courses on basic education	0.90	(3.69)	0.85	0.07

Data Sources: VHS statistic, Heddesheimer et al. (2025), BBSR, Rupieper and Thomsen (2025), Bundesagentur für Arbeit (2005), Lehnert et al. (2023b).

Notes: The baseline value for voter turnout is 70.55 in 1990. Standard errors are clustered at the county level. Mean course availability is reported as number of courses on this subject per thousand inhabitants. Included years: 1994, 1998, 2002. $N = 225$.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 10: Effect of VHS Courses on Participatory Behaviors by Content

	(1) Interested in politics	(2) Participation in political parties, local politics, citizens' initiatives	(3) Volunteering in clubs, associations, or social services
Panel A: Courses on Society & Politics			
Marginal effect	0.03 (0.02)	-0.03 (0.02)	0.02 (0.03)
R^2	0.68	0.58	0.62
Panel B: Courses on Culture & Arts			
Marginal effect	0.00 (0.02)	0.02 (0.01)	0.02 (0.02)
R^2	0.68	0.58	0.62
Panel C: Courses on Health			
Marginal effect	0.00 (0.01)	0.03** (0.01)	0.04* (0.02)
R^2	0.68	0.58	0.62
Panel D: Language Courses			
Marginal effect	-0.01 (0.01)	0.00 (0.01)	0.04 (0.03)
R^2	0.68	0.58	0.62
Panel E: Courses on Work & Occupation			
Marginal effect	0.00 (0.02)	0.01 (0.02)	0.03 (0.03)
R^2	0.68	0.58	0.62
Panel F: Courses on Basic Education			
Marginal effect	-0.05 (0.05)	-0.04 (0.02)	0.14 (0.10)
R^2	0.68	0.58	0.62
Baseline	0.49	0.16	0.27
N	36,152	25,529	25,570

Data Sources: VHS statistic, SOEP v39, BBSR, Rupieper and Thomsen (2025), Bundesagentur für Arbeit (2005), Lehnert et al. (2023b).

Notes: Each coefficient stems from a separately estimated regression model. All specifications control for spatial and personal characteristics, year fixed effects and person fixed effects. Standard errors are clustered at the county level and given in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 11: Marginal Effect of VHS Courses on Stated Party Preferences

	Supporting a Specific Political Party					
	CDU (1)	FDP (2)	SPD (3)	PDS (4)	Green (5)	Far Right (6)
Course exposure	0.00 (0.01)	0.00 (0.00)	0.01 (0.01)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Age	0.00 (0.00)	0.00*** (0.00)	0.00 (0.00)	0.01*** (0.00)	0.00** (0.00)	0.00 (0.00)
Married	-0.02 (0.02)	0.00 (0.01)	0.02 (0.04)	0.01 (0.02)	0.00 (0.02)	-0.02 (0.02)
Log household income	0.02 (0.01)	0.01 (0.01)	-0.02 (0.01)	-0.03*** (0.01)	0.02* (0.01)	0.01 (0.01)
Low educational level	-0.03 (0.03)	-0.01 (0.01)	0.07* (0.04)	-0.06 (0.04)	0.04* (0.02)	0.02 (0.01)
High educational level	0.06 (0.06)	0.01 (0.02)	0.00 (0.07)	-0.04*** (0.01)	-0.04 (0.03)	0.00 (0.01)
Registered as unemployed	0.00 (0.01)	-0.01 (0.01)	0.00 (0.02)	0.01 (0.01)	-0.01 (0.01)	0.00 (0.01)
Population density	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Unemployed population share	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Baseline	0.39	0.06	0.35	0.09	0.09	0.00
Change relative to baseline	0.00	-0.01	0.03	-0.02	0.00	.
ATT	-0.06	-0.02	0.27	-0.05	0.01	0.03
R^2	0.89	0.71	0.84	0.89	0.79	0.67

Data Sources: SOEP v39, VHS statistic, BBSR, Rupieper and Thomsen (2025), Bundesagentur für Arbeit (2005), Lehnert et al. (2023b).

Notes: Marginal effect on being exposed to an additional VHS course per thousand inhabitants on the probability of supporting a specific political party in the following year. All specifications control for year fixed effects, person fixed effects, and logarithmized surface shares. Standard errors are clustered at the county level and given in parentheses. Respondents could name several parties they tend to support. Included Years: 1992 - 2002. $N = 12,146$.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 12: Marginal Effect of VHS Courses on Revealed Party Preferences

	Vote shares in federal elections					
	CDU (1)	SPD (2)	FDP (3)	PDS (4)	Alliance 90/ The Greens (5)	Far-right parties (6)
Course exposure	0.09 (0.32)	0.44 (0.37)	-0.24*** (0.08)	-0.04 (0.11)	-0.14 (0.23)	-0.02 (0.06)
Population density	-0.01* (0.01)	-0.02*** (0.01)	0.00 (0.00)	0.00 (0.00)	0.02*** (0.01)	0.00** (0.00)
Unemployed population share	0.23* (0.13)	-0.27* (0.16)	0.01 (0.03)	0.10** (0.04)	-0.12 (0.08)	0.02 (0.02)
R^2	0.96	0.94	0.94	0.88	0.89	0.96
Baseline	0.42	0.25	0.13	0.06	0.10	0.02
Change relative to baseline	0.21	1.77	-1.79	-0.70	-1.39	-0.84

Data Sources: Heddesheimer et al. (2025), VHS statistic, BBSR, Rupieper and Thomsen (2025), Bundesagentur für Arbeit (2005), Lehnert et al. (2023b).

Notes: Specification controls for surface shares, county and year fixed effects. Standard errors are clustered at the county level. Baseline values refer to each party's vote share in the federal election of 1990. Included Years: 1994, 1998, 2002. N = 225.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 13: Effect of Cumulated Course Exposure on Political Attitudes and Participation

	Political Attitudes		Participatory Behavior		
	(1) Being socially and politically active considered important	(2) Considering political influence as relevant for life satisfaction	(3) Interested in politics	(4) Participation in political parties, local politics, citizens' initiatives	(5) Volunteering in clubs, associations, or social service
Cumulated course exposure	0.00 (0.01)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Baseline	0.13	0.44	0.49	0.16	0.27
Change relative to baseline	0.01	0.00	0.00	0.00	0.00
ATT	0.03	-0.02	0.05	0.01	-0.03
N	6,190	8,999	36,152	25,529	25,570
R^2	0.78	0.66	0.68	0.58	0.62

Data Sources: VHS statistic, SOEP v39, BBSR.

Notes: All specifications control for socio-demographic and spatial characteristics, person fixed effects, and year fixed effects. Standard errors are clustered at the county level and given in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 14: Effect of Cumulated Course Exposure on Voter Turnout

	Voter turnout	
	(1)	(2)
Lagged exposure	-0.55** (0.27)	
Cumulated exposure		-0.06 (0.05)
N	225	225
R^2	0.85	0.85

Data Sources: VHS statistic, Heddesheimer et al. (2025), BBSR.

Notes: Standard errors are clustered at the county level.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 15: Effect of Enrollments on Voter Turnout

	Voter turnout in federal elections	
	(1)	(2)
VHS courses per thousand inhabitants	-0.55** (0.27)	
Course enrollments per thousand inhabitants		-0.04** (0.02)
N	225	225
R^2	0.85	0.85

Data Sources: VHS statistic, Heddesheimer et al. (2025), BBSR.

Notes: Standard errors are clustered at the county level.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 16: Effect of Enrollments on Political Attitudes and Participation

	Political Attitudes		Participatory Behavior		
	(1) Being socially and politically active considered important	(2) Considering political influence as relevant for life satisfaction	(3) Interested in politics	(4) Participation in political parties, local politics, citizens' initiatives	(5) Volunteering in clubs, associations, or social service
Enrollments per thousand inhabitants	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Baseline	0.13	0.44	0.49	0.16	0.27
Change relative to baseline	0.01	0.00	0.00	0.00	0.00
ATT	0.05	-0.02	0.01	0.01	0.02
Mean number of enrollments	25.29	31.83	30.93	30.60	30.59
N	6,190	8,999	36,152	25,529	25,570
R^2	0.78	0.66	0.68	0.58	0.62

Data Sources: VHS statistic, SOEP v39, BBSR.

Notes: All specifications control for socio-demographic and spatial characteristics, person fixed effects, and year fixed effects. Standard errors are clustered at the county level and given in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 17: Effect of Course Exposure on Ordinal-Scaled Outcomes

	(1)	(2)	(3)
	Interest in politics	Importance of being socially and politically active	Relevance of political influence for satisfaction
Course exposure	0.00 (0.01)	0.00 (0.03)	-0.03 (0.03)
Age	0.01*** (0.00)	-0.02 (0.02)	0.01 (0.01)
Married	0.01 (0.03)	-0.15 (0.13)	0.07 (0.07)
Log household income	0.00 (0.02)	0.01 (0.09)	-0.03 (0.05)
Low educational level	-0.05 (0.04)	0.34 (0.41)	-0.31* (0.17)
High educational level	0.03 (0.06)	-0.37 (0.33)	-0.06 (0.17)
Registered as unemployed	0.01 (0.02)	-0.05 (0.05)	0.02 (0.04)
Population density	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Unemployed population share	0.00 (0.00)	0.00 (0.01)	-0.01 (0.01)
Baseline	2.54	1.76	2.36
Change relative to baseline	0.00	0.00	-0.01
ATT	-0.08	-0.01	-1.05
N	36,152	6,190	8,999
R^2	0.71	0.80	0.69

Data Sources: VHS statistic, SOEP v39, BBSR.

Notes: The outcomes are all measured on four-point Likert scales. Higher values denote greater political interest, importance, or relevance. All specifications additionally control for year fixed effects, person fixed effects, and logarithmized surface shares. Standard errors are clustered at the county level and given in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 18: Effect of VHS Courses on Political Attitudes and Participatory Behaviors When Controlling for Local Subsidies

	Political Attitudes		Participatory Behavior		
	(1) Importance of being politically and and socially active	(2) Relevance of political influence for life satisfaction	(3) Interest in politics	(4) Participation in political parties, local politics, citizens' initiatives	(5) Volunteering in clubs, associations, or social services
Course exposure	0.01 (0.01)	-0.01 (0.02)	0.00 (0.01)	0.00 (0.01)	0.02* (0.01)
Log of local subsidies	0.00 (0.01)	0.00 (0.01)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
N	6,190	8,999	36,152	25,529	25,570
R^2	0.78	0.66	0.68	0.58	0.62
Baseline	0.13	0.44	0.49	0.16	0.27
Change relative to baseline	0.08	-0.01	0.00	0.02	0.06
ATT effect	0.33	-0.16	-0.03	0.08	0.52

Data Sources: SOEP v39, VHS, BBSR, Rupieper and Thomsen (2025), Bundesagentur für Arbeit (2005), Heddesheimer et al. (2025).

Notes: Local subsidies entail subsidies paid by municipalities and counties. All specifications control for socio-demographic characteristics, spatial characteristics, person fixed effects, and year fixed effects. Standard errors are clustered at the county level and given in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 19: Effect of VHS Courses on Turnout When Controlling For Local Subsidies

	Voter turnout in federal elections	
	(1)	(2)
VHS courses per thousand inhabitants	-0.55** (0.27)	-0.55** (0.27)
Log of local subsidies to VHS		0.12 (0.11)
R^2	0.85	0.85

Data Sources: Heddesheimer et al. (2025), VHS statistic, BBSR, Rupieper and Thomsen (2025), Bundesagentur für Arbeit (2005), Lehnert et al. (2023b).

Notes: Standard errors are clustered at the county level. $N = 225$.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 20: Effect of VHS Courses on Political Attitudes and Participatory Behaviors When Controlling For County Fixed Effects

	Political Attitudes		Participatory Behavior		
	(1) Importance of being politically and and socially active	(2) Relevance of political influence for life satisfaction	(3) Interest in politics	(4) Participation in political parties, local politics, citizens' initiatives	(5) Volunteering in clubs, associations, or social services
Course exposure	0.01 (0.01)	0.00 (0.02)	0.00 (0.01)	0.00 (0.01)	0.02* (0.01)
N	6,190	8,999	36,152	25,529	25,570
R^2	0.78	0.67	0.68	0.58	0.62
Baseline	0.13	0.44	0.49	0.16	0.27
Change relative to baseline	0.09	0.00	0.00	0.02	0.07
ATT	0.35	-0.05	0.04	0.09	0.56

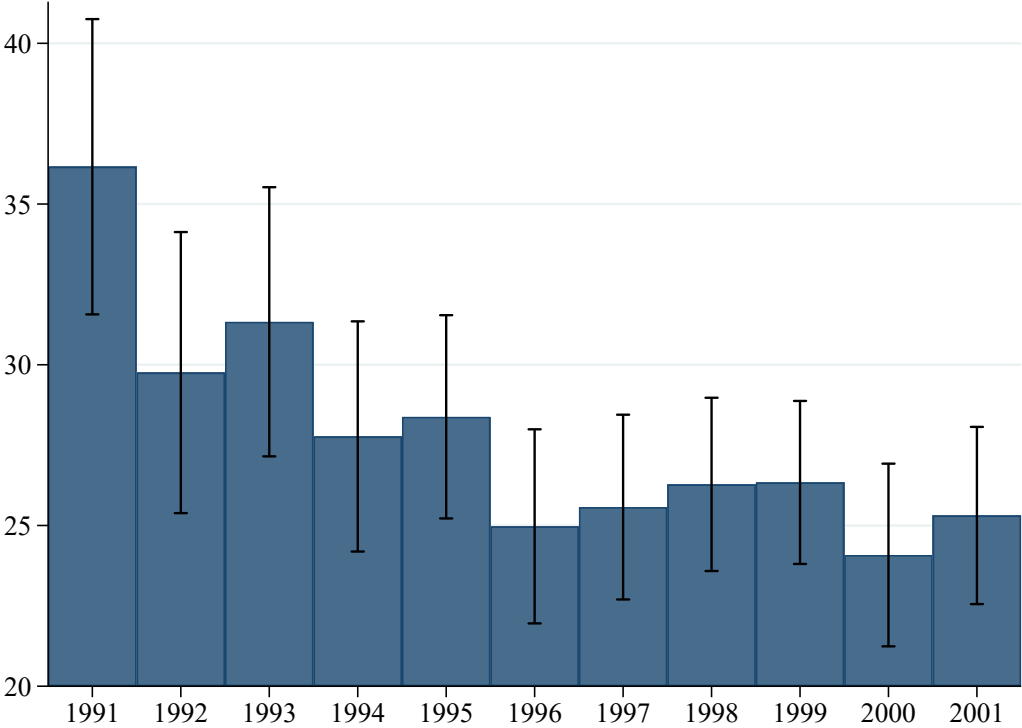
Data Sources: SOEP v39, VHS, BBSR, Rupieper and Thomsen (2025), Bundesagentur für Arbeit (2005), Heddesheimer et al. (2025).

Notes: All specifications control for county fixed effects, person fixed effects, year fixed effects, socio-demographic characteristics and regional characteristics. Standard errors are clustered at the county level and given in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Appendix: Figures

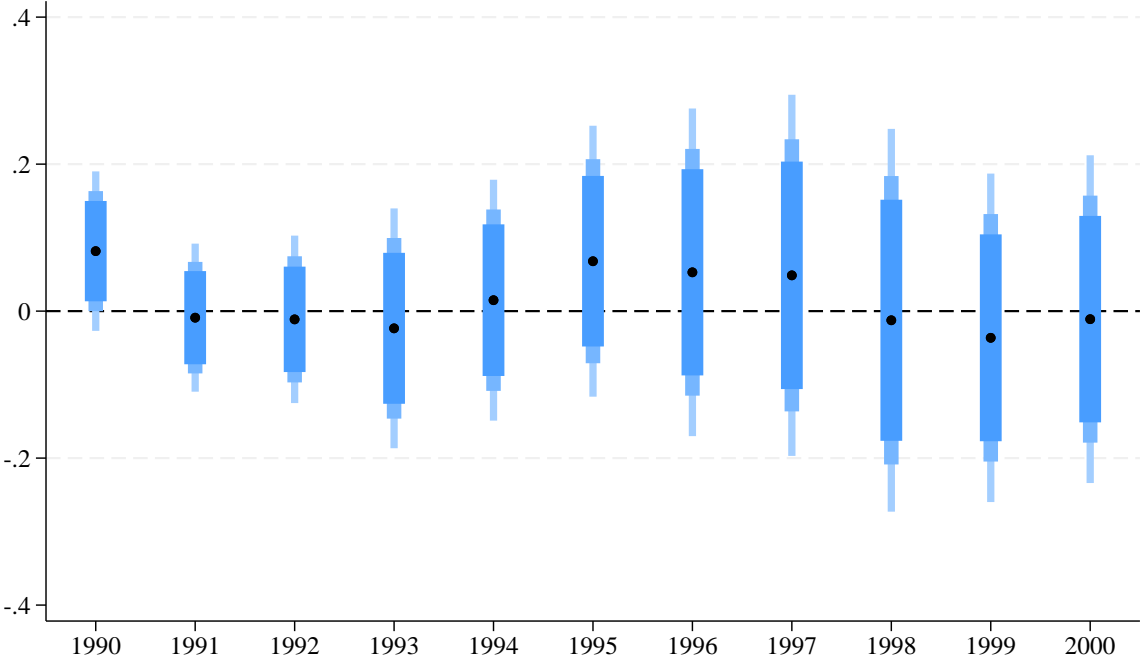
Figure 8: Share of Local Subsidies in VHS Budgets Over Time



Data Sources: VHS statistic, BBSR.

Notes: Figure shows the share of subsidies paid by local authorities (county, municipality) in the budget of VHS over time. Confidence intervals are shown at the 95 % level.

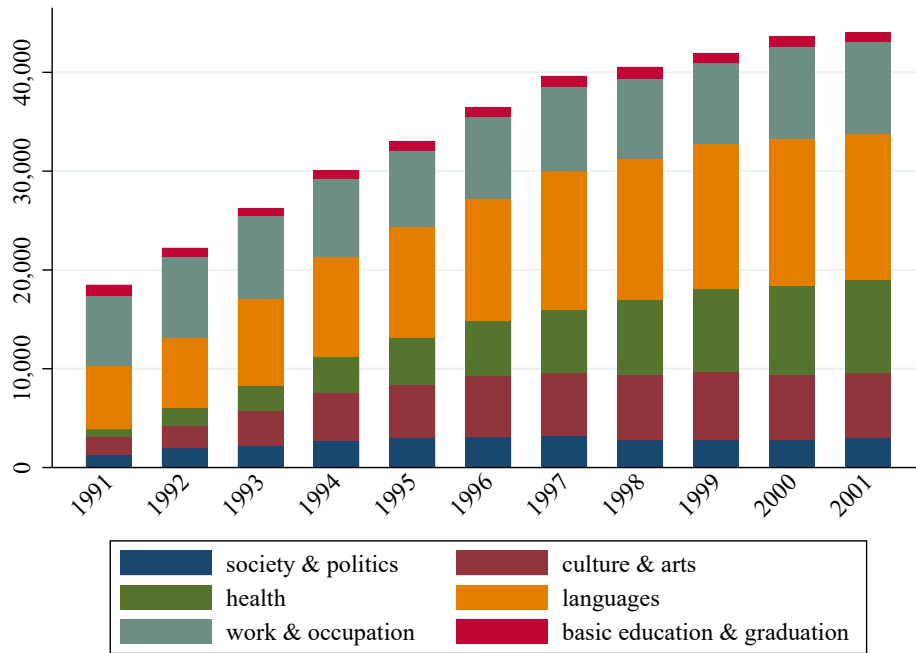
Figure 9: Correlation between holding a tertiary degree and county-level availability of VHS courses in the next year



Data Sources: SOEP v39, VHS statistic, BBSR.

Notes: The figure shows the association between the indicator for high educational attainment and later VHS course availability over time. Standard errors are clustered at county level. Confidence intervals are shown at the 90, 95 and 99 % level.

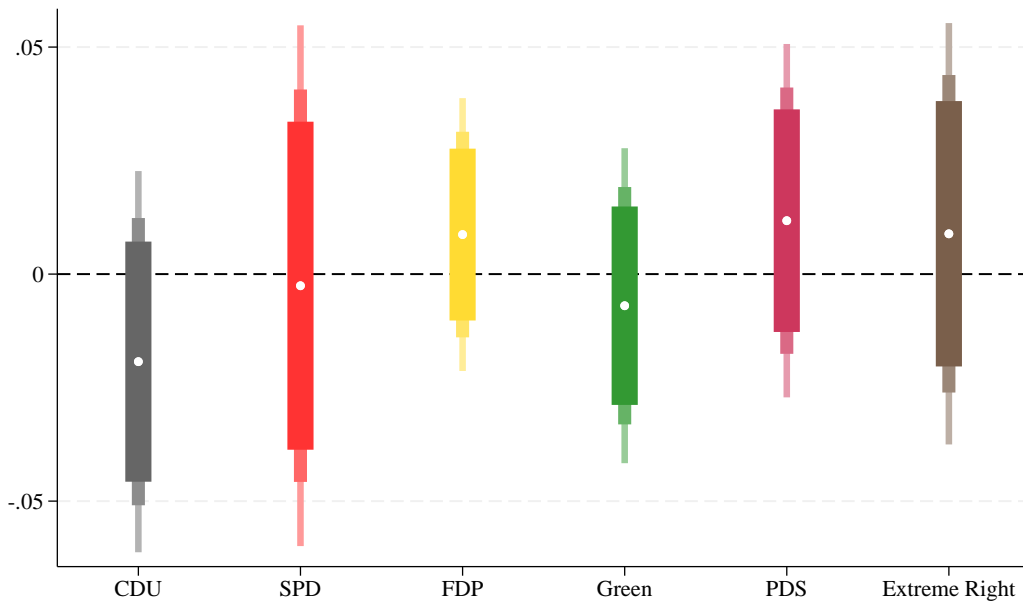
Figure 10: Course Topics



Data Sources: VHS statistic, BBSR.

Notes: The figure shows the yearly sum of VHS courses conducted in East Germany by course topic.

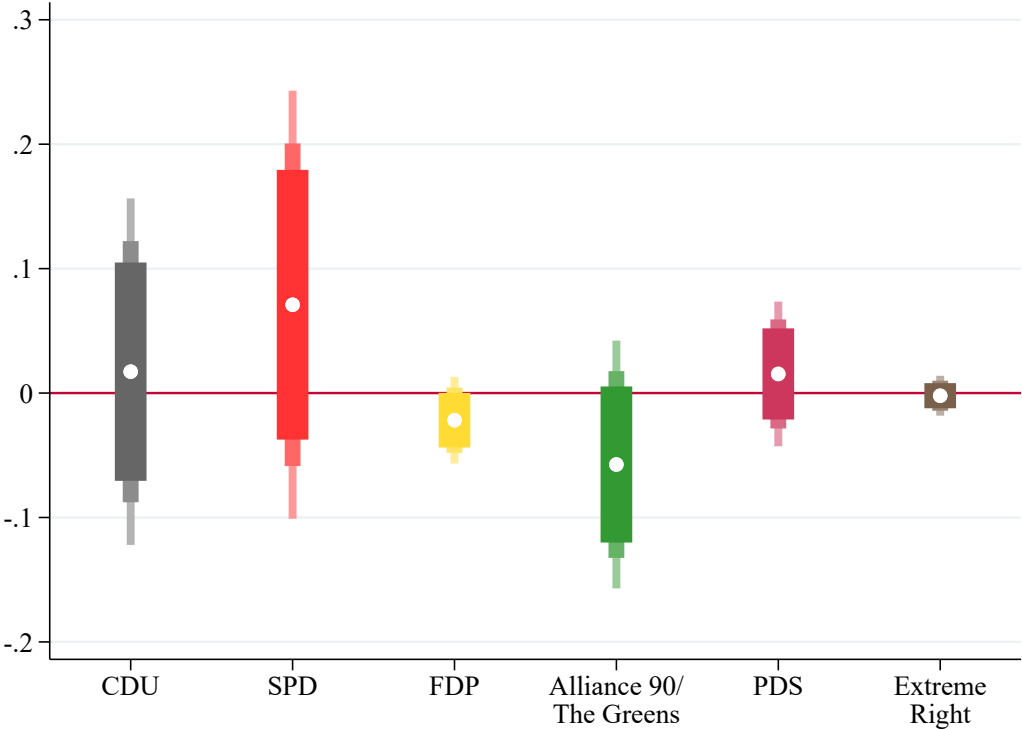
Figure 11: Marginal Effect of VHS Courses on Individuals' Probability of Supporting a Specific Party (Election Years Only)



Data Sources: SOEP v39, VHS, BBSR, Rupieper and Thomsen (2025), Bundesagentur für Arbeit (2005), Lehnert et al. (2023b).

Notes: Standard errors are clustered at the county level. Confidence intervals are shown at the 90, 95, and 99 % level.

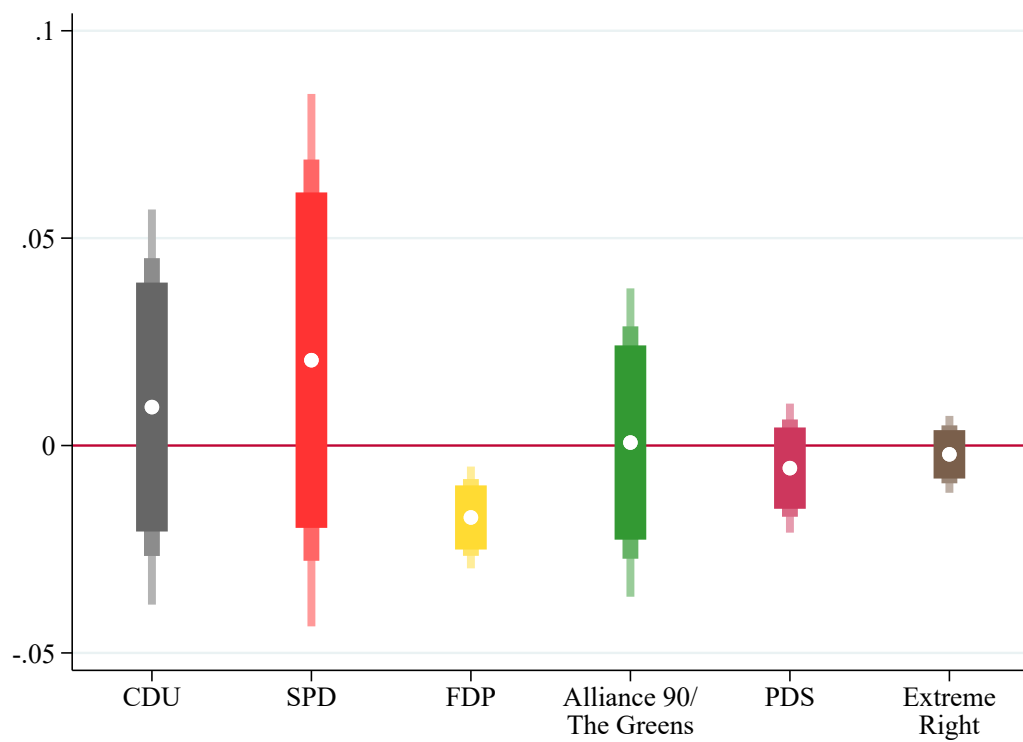
Figure 12: Effect of Cumulated VHS Courses on Parties' Vote Shares in Federal Elections



Data Sources: Heddesheimer et al. (2025), VHS, BBSR, Rupieper and Thomsen (2025), Bundesagentur für Arbeit (2005), Lehnert et al. (2023b).

Notes: Standard errors are clustered at the county level. Confidence intervals are shown at the 90, 95, and 99 % level.

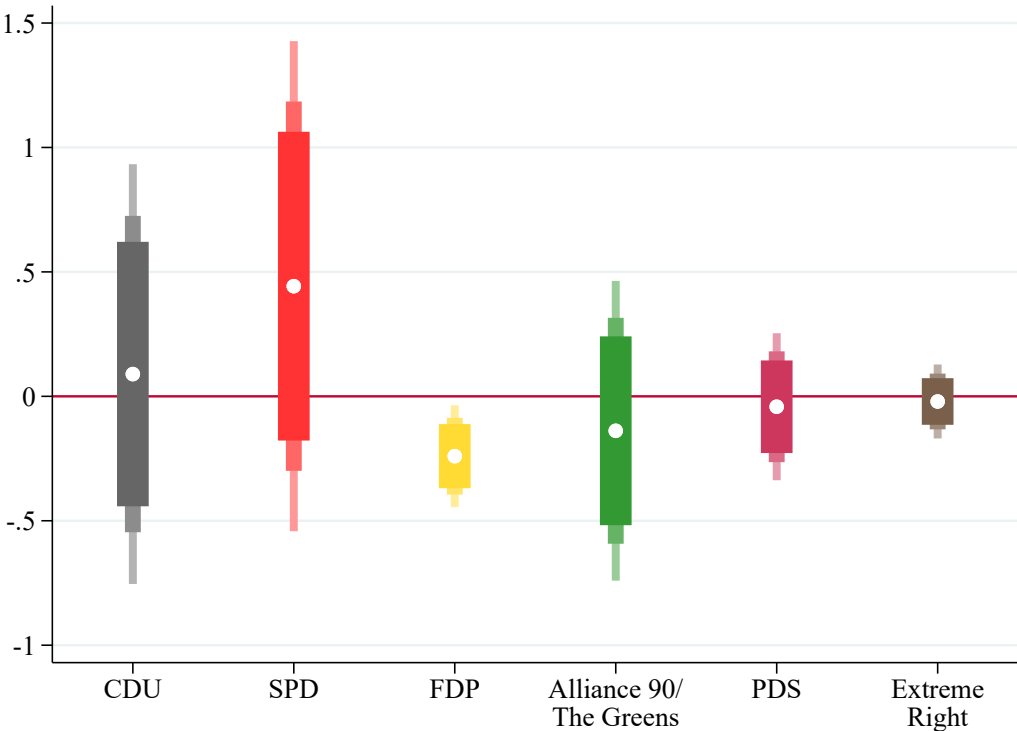
Figure 13: Effect of Enrollments on Parties' Vote Shares in Federal Elections



Data Sources: Heddesheimer et al. (2025), VHS, BBSR, Rupieper and Thomsen (2025), Bundesagentur für Arbeit (2005), Lehnert et al. (2023b).

Notes: Standard errors are clustered at the county level. Confidence intervals are shown at the 90, 95, and 99 % level.

Figure 14: Effect of VHS Education on Parties' Vote Shares in Federal Elections When Controlling for Local Subsidies



Data Sources: Heddeshimer et al. (2025), VHS, BBSR, Rupieper and Thomsen (2025), Bundesagentur für Arbeit (2005), Lehnert et al. (2023b).
Notes: Standard errors are clustered at the county level. Confidence intervals are shown at the 90, 95, and 99 % level.