

Civic statistics in teacher education - Effects among future math and civic teachers

Florian Weber-Stein and Olushina Olawale Awe
Ludwigsburg University, Germany
florian.weber-stein@ph-ludwigsburg.de

This paper presents findings from an interdisciplinary seminar for pre-service mathematics and civics teachers aimed at fostering civic statistical literacy. Based on the concept of civic statistics, the course integrated statistical learning with critical engagement with data in social and political contexts. Pre- and post-survey data were used to compare baseline differences between groups, assess learning outcomes, and explore how interdisciplinary learning develops through engagement across disciplinary boundaries.

DATA LITERACY AS A CHALLENGE FOR TEACHER EDUCATION

Data literacy is increasingly seen as a global key competence (Schüller et al., 2019; Awe et al., 2022) – not only in the context of science (Qiao et al., 2024), but also from the perspective of social sciences (De Mesquita & Fowler, 2021) and civic education (Shreiner & Dykes, 2021). Political decisions are often based on complex data: from pandemic models and climate forecasts to economic indicators. Meaningful democratic participation requires the ability to understand, interpret, and critically assess data. Without these skills, informed engagement in political discourse is limited.

However, empirical studies reveal significant shortcomings. In the U.S., the Stanford History Education Group found major deficits in digital information literacy among high school students (McGrew et al., 2018). Similar trends appear in Germany, where fewer than half of 15-year-olds feel able to assess online information quality (Kastorff et al., 2025).

These findings highlight the urgent need to strengthen data literacy across all levels of education. However, data literacy is not a monolithic concept. It includes interpreting statistical information, detecting misleading data use, and contextualizing data in social and political realities. This multi-dimensionality calls for subject-specific contributions: mathematics education can emphasize statistical reasoning and uncertainty, while civic education focuses on source evaluation, misinformation, and political implications.

At the same time, disciplinary boundaries must be crossed. To address this, we designed an interdisciplinary seminar for pre-service teachers of mathematics and civics. It aims to foster data literacy in response to societal challenges, following the concept of “civic statistics” (Ridgway, 2022). The course encourages mutual learning: mathematics students engage with political dimensions of data, while civics students develop foundational statistical competencies.

In this paper, we focus on two main questions. First, we ask how pre-service teachers in mathematics and civics differ at the beginning of the seminar – for example, in terms of their attitudes toward statistics, their information-seeking behavior, and their political attitudes. Second, we examine how the seminar impacts each group and what effects can be observed.

BACKGROUND AND RELATED WORK

In recent years, several promising approaches have emerged in the field of data literacy education. The Stanford History Education Group, for example, has developed a comprehensive Civic Online Reasoning curriculum that provides teaching materials for evaluating information found online (McGrew et al., 2018). However, statistical literacy plays only a minor role in this framework.

In contrast, work in the field of statistical literacy has increasingly emphasized the importance of contextualizing statistical learning within meaningful social settings. Weiland (2017) has extended this approach by developing the concept of “critical statistical literacy”, which foregrounds a power-sensitive and equity-oriented perspective on data in education. Our project draws on the ProCivicStat framework (Gal et al., 2022), which highlights the value of engaging learners with authentic, multivariate datasets and provides a pedagogical design aligned with this aim.

While the conceptual foundations for transformative approaches to data literacy are strong, empirical research on their effectiveness remains limited. One notable exception is the study by Louie et al. (2022), who developed and evaluated a high school curriculum module focused on income

inequality. Their findings show statistically significant gains in students' statistical understanding and interest in data analysis. Students also developed key elements of critical data literacy, including multivariable thinking and a heightened awareness of social justice issues. Another important contribution comes from Shreiner and Dykes (2021), who found that while social studies teachers view data literacy as vital for civic reasoning, many lack the confidence and preparation to teach it effectively, highlighting a need for better support in teacher education.

Although these studies provide valuable insights, interdisciplinary research on data literacy in pre-service teacher education – especially at the intersection of mathematics and civics – remains scarce. Our paper addresses this gap by exploring how future teachers from different subject areas engage with data literacy and what forms of interdisciplinary learning emerge in the process.

STRUCTURE AND CONTENT OF THE COURSE

The structure of our seminar, comprising four modules, is guided by the design principles of the ProCivicStat framework (Gal et al., 2022). Since the pedagogical framework and its underlying rationale have been described in detail elsewhere (Engel et al., 2025), we provide only a brief tabular overview here (Table 1, reproduced from *ibid.*).

Table 1. Table summarizing course topics, technologies, statistical concepts, and estimated time.

	Module 1	Module 2	Module 3	Module 4
Content	Gender pay gap	Social and economic inequality within European countries	Quality of democracy	Introduction into Peace and Conflict Research
Database(s)	American Community Survey (ACS)	EuroStat (via United Nations University, https://www4.wider.unu.edu/)	Freedom House Index, Polity Index (available via www.gapminder.org or https://ourworldindata.org)	Uppsala Conflict Data Program of the Peace Research Institute Oslo SIPRI, https://www.sipri.org
Technology	CODAP	CODAP	Gapminder, CODAP, R	CODAP
Statistical Concepts	<ul style="list-style-type: none"> - Measures of central tendency - Measures of dispersion - Boxplots - Concept of distribution 	<ul style="list-style-type: none"> - Scales of measurement - Gini coefficient - Lorenz curve - Trend line - Data quality and data collection 	<ul style="list-style-type: none"> - Index values - Correlation - Regression - Confounders - Simpson's paradox - Introduction to R 	<ul style="list-style-type: none"> - Time series - Aggregation and disaggregation of data
Time requirement	2.5 seminar sessions to introduce statistical concepts, motivate the topic, and take first steps with CODAP; completion as homework	2 seminar sessions, plus subject-specific homework	3 seminar sessions (twice separated by subject), plus subject-specific homework	2.5 seminar sessions introducing peace and conflict research, with extensions on time series and indices; completion as homework
		Two additional seminar sessions were used for group work on the video projects with guidance from the instructors; the projects were completed as homework. In the final two seminar sessions, the video projects were presented and discussed.		

The seminar integrates statistical literacy with civic and political learning. Students explore societal issues such as inequality, climate change, and public health using complex, multivariate datasets. Basic statistical concepts are introduced through focused instruction and practiced with web-based tools like Gapminder and CODAP. The tasks promote hands-on engagement with real-world data and encourage students to apply statistical reasoning in meaningful civic contexts through inquiry-based learning.

The course concludes with a project phase where small student groups produce short explainer videos on a topic of their choice. These videos convey key statistical insights on social or political issues and serve as both a learning product and assessment.

The seminar integrates timely and socially relevant topics, including pandemic policy responses (Weber-Stein & Engel, 2025) and peace and conflict studies (Engel et al., 2025). Students engaged in

interpreting authentic data from multiple perspectives and linking statistical reasoning to normative political questions.

METHOD

To investigate the effects of the intervention, we employed a quasi-experimental pre-post design with a treatment group (TG, longitudinal section $N=76$) and a control group (CG, $N=61$). Data were collected between 2022 and 2025. Participants were pre-service teachers in their second or third year of undergraduate studies at Ludwigsburg University of Education, majoring in mathematics and/or civics and preparing for secondary education (Sekundarstufe I) or, in a small number of cases, special education (Lehramt Sonderpädagogik). The control group consisted of students enrolled in parallel mathematics or civics seminars with similar thematic orientations (i.e., a course on probability and statistics, and seminars on democratic theory and peace and conflict studies, respectively). Gender was not collected but is assumed to be roughly evenly distributed (see Table 2).

Table 2. Description of Sample.

Semester	Group	Pre/Post	N total	Civics	Math	Both
Summer 2022	TG	Pre	35	24	9	2
Summer 2022	TG	Post	25	17	6	2
Winter 2023/24	TG	Pre	31	10	19	2
Winter 2023/24	TG	Post	28	9	17	2
Winter 2024/25	TG	Pre	24	12	12	-
Winter 2024/25	TG	Post	23	12	11	-
Winter 2024/25	CG	Pre	72	38	34	-
Winter 2024/25	CG	Post	61	34	27	-

Data were gathered through online questionnaires administered online during class time at the beginning and end of the seminars. The dropout rate between pre- and post-assessments varied between approx. 5% and 30% across the three cohorts. Statistical analyses were conducted in R and included paired-sample and independent-sample t-tests. For scales with non-normally distributed difference scores (Shapiro-Wilk $p < .05$), Wilcoxon signed-rank tests were additionally performed. In all cases, these confirmed the direction and significance of the t-test results. Effect sizes are reported as Cohen's d (for t-tests) and as r (for Wilcoxon tests), following conventional benchmarks: $d = .2/.5/.8$ and $r = .1/.3/.5$ for small, medium, and large effects, respectively.

The key outcome variables cluster into three conceptual domains:

- *Attitudes toward statistics* were measured using the 28-item scale developed by Schau (2003), which includes the subdimensions affect, cognitive competence, perceived difficulty, and value, each rated on a 7-point Likert scale. In addition, we assessed beliefs about the relationship between mathematics and statistics, using a single item (Math4Stat).
- *Information-related efficacy beliefs*, including a shortened version of the Self-Efficacy Scale for Information Searching Behavior (SES-IB-16; 12 of 16 original items), and a single-item measure of *trust in science* (adapted from Wissenschaft im Dialog, 2023), both using 5-point Likert scales and.
- General political dispositions, including *internal political efficacy* (2 items) based on Beierlein et al. (2014), *political interest* (single item), and *self-concept of political capabilities* (5 items) based on Krampen (1991; p. 78). Political variables were measured using 4- or 5-point scales.

Negatively worded items were reverse-coded prior to scale construction. Cronbach's alpha was calculated for each multi-item scale to assess internal consistency. Only participants with complete longitudinal data (pre and post) were included in the analysis of intervention effects.

FINDINGS

We present initial findings addressing two guiding research questions RQ1: *How do students differ in their baseline attitudes, interests, and competencies depending on their subject background (mathematics vs. civics)?* and RQ2: *What effects can be observed as a result of the intervention, based on comparisons between the treatment and control groups, with additional differentiation by subject*

where appropriate? Due to the limited size of the subgroups, interpretations should be made with caution.

Reliability of scales

To assess the internal consistency of the applied scales, Cronbach's alpha was calculated separately for mathematics and civics subgroups, further differentiated by treatment and control group as well as by measurement time point (see Table 3). All multi-item scales showed at least acceptable reliability across groups, with some lower values for the civics treatment subgroup on the statistical attitudes affect and political efficacy scales post-intervention (for details see Table 3):

Table 3. Reliability of Scales (TG-M = treatment group, math students, TG-C = treatment group, civics students; all values refer to Cronbach's α at pre- and post-measurement; items marked with “-” have been inverted for calculation.)

Scale (Items)	Example Item	TG-M (pre/post)	TG-C (pre/post)	CG-M (pre/post)	CG-C (pre/post)
statistical attitudes – affect (6)	<i>I am scared by statistics (-)</i>	.83/.68	.57/.34	.67/.75	.73/.64
statistical attitudes – competence (6)	I can learn statistics.	.78/.85	.77/.56	.77/.80	.71/.79
statistical attitudes – value (9)	<i>Statistics is worthless (-)</i>	.74/.85	.77/.79	.84/.81	.75/.83
statistical attitudes – difficulty (7)	Statistics is a subject quickly learned by most.	.61/.79	.59/.75	.79/.74	.80/.71
information-related efficacy (12)	I quickly recognize what's important.	.88/.89	.70/.77	.84/.89	.90/.91
internal political efficacy (2)	I can understand and assess political issues.	.83/.74	.75/.58	.76/.77	.75/.67
political self-concept (5)	<i>I am unsure when evaluating political issues (-)</i>	.90/.83	.80/.82	.92/.89	.74/.71

RQ1 – Baseline Differences between Mathematics and Civics Students (Pre-Intervention)

Since no learning effects could have occurred yet, treatment and control groups were pooled for this comparison (results in Table 4).

- *Attitudes towards statistics*: At baseline, mathematics students reported more positive affective attitudes toward statistics compared to their civics peers ($M=4.15 / SD=1.17$ vs. $3.65 / 1.10$; $r=.18$, n.s.). Small to moderate effect sizes suggest slightly more favorable attitudes among mathematics students for the competence, difficulty, and value subscales, although no statistically significant differences were found. Regarding beliefs about the connection between mathematics and statistics (Math4Stat), civics students were more likely to agree that mathematics competence is necessary for engaging with statistics ($M=4.10 / SD=1.68$ vs. $3.35 / 1.36$; $r=.22$, n.s.). This indicates a perception gap that may influence learners' confidence in statistical learning, especially among civics students. To address this, our course emphasizes visual and exploratory approaches to statistics, using accessible tools and authentic datasets to lower entry barriers and foster statistical engagement across disciplines.
- *Information-related self-efficacy and trust in science*: Civics students reported significantly higher self-efficacy in information-seeking behavior compared to mathematics students ($M=3.67 / SD=.52$ vs. $3.33 / .57$; $d=-.62^{**}$). They also showed slightly higher levels of *trust in science* ($M=4.41 / SD=.62$ vs. $4.12 / .74$; $r=.20^*$), but the effect was smaller.
- *General political dispositions*: As expected, civics students scored substantially higher on all three variables. They expressed significantly greater *political interest* ($M=4.60 / SD=.58$ vs. $2.86 / 1.32$; $r=.64^{***}$), higher *internal political efficacy* ($4.16 / .70$ vs. $2.99 / 1.08$; $r=.54^{***}$), and a stronger *political self-concept* ($3.58 / .62$ vs. $2.47 / .99$; $r=.55^{***}$). Given these differences, the course seeks to balance disciplinary strengths by stimulating mathematics students' interest in political questions through data-based explorations of real-world issues.

Table 4: Baseline Differences between Pre-Service Mathematics and Civics Teachers

Variable	Math (M/SD)	Civics (M/SD)	Effect size	p-value	test-type
Statistical Attitudes - Affect	4.15 / 1.17	3.65 / 1.10	.18 (<i>r</i>)	.056	Wilcoxon
Statistical Attitudes - Competence	4.83 / .90	4.52 / .98	.34 (<i>d</i>)	.079	t-test
Statistical Attitudes - Difficulty	3.58 / .76	3.40 / .84	.23 (<i>d</i>)	.236	t-test
Statistical Attitudes - Value	4.90 / .86	4.79 / .85	.05 (<i>r</i>)	.573	Wilcoxon
Math4Stat	3.35 / 1.36	4.10 / 1.68	.22 (<i>r</i>)	.006	Wilcoxon
Information-related efficacy	3.33 / .57	3.67 / .52	-.62 (<i>d</i>)	.001	t-test
Trust in science	4.12 / .74	4.41 / .62	.20 (<i>r</i>)	.036	Wilcoxon
Political interest	2.86 / 1.32	4.60 / .58	.64 (<i>r</i>)	.000	Wilcoxon
Internal political efficacy	2.99 / 1.08	4.16 / .70	.54 (<i>r</i>)	.000	Wilcoxon
Political self-concept	2.47 / .99	3.58 / .62	.55 (<i>r</i>)	.000	Wilcoxon

RQ2 – Intervention Effects (Pre-Post)

(1) Intervention effects (Treatment Group vs. Control Group): The comparison between the treatment group (TG) and the control group (CG) shows clear positive effects of the intervention across several key variables:

- *Statistical attitudes* improved significantly in the TG except for difficulty: affect (TG: $\Delta M = .71 / SD = .82$ vs. CG: $.20 / 1.16$; $d = .51^*$), competence (TG: $\Delta M = .59 / SD = .94$ vs. CG: $-.18 / .76$; $d = .90^{***}$), and value (TG: $\Delta M = .24 / SD = .84$ vs. CG: $-.13 / .82$; $d = .44^*$).
- *Information-related efficacy* increased with a small effect size (TG: $\Delta M = .23 / SD = .45$ vs. CG: $.06 / .47$; $d = .37$, n.s.). *Trust in science* also showed a small to moderate increase (TG: $\Delta M = .25 / SD = .65$ vs. CG: $-.02 / .86$; $r = .17$, n.s.).
- For *political interest* (TG: $\Delta M = .28 / SD = .83$ vs. CG: $-.03 / .97$; $r = .13$, n.s.) only a small effect is visible, *internal political efficacy* (TG: $\Delta M = .27 / SD = .66$ vs. CG: $.20 / .70$; $r = 0.03$, n.s.) did not show noteworthy improvements, whereas for the *political self-concept* (TG: $\Delta M = .29 / SD = .54$ vs. CG: $.07 / .48$; $r = .19^*$) a small to moderate effect was discerned.

These results indicate that the intervention mainly affected statistical attitudes and had only a minor effect on information-related efficacy, trust in science and general political attitudes compared to the group as a whole.

(2) Differences in effects across subgroups (math vs. civics students): When comparing math (TG-M) and civics (TG-C) students within the treatment group, several interesting patterns emerge. Figure 1 shows the distribution of the groups for each variable in detail, using a combination of violin plots and boxplots.

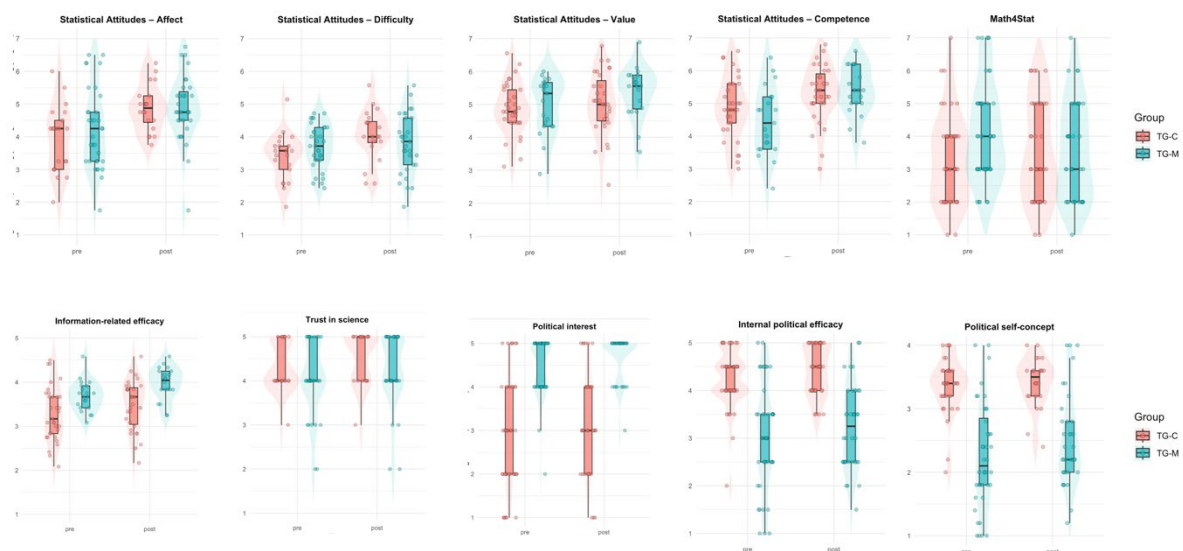


Figure 1. Change in key constructs (pre/post) by subgroup (TG-M vs. TG-C). Combination of violin plots and boxplots.

- *Statistical attitudes*: Both groups showed strong improvements, which were even more pronounced among civics students in most areas of statistical attitudes, particularly affect (TG-C: $\Delta M = .93 / SD = .86$; $d = 1.08^{***}$ vs. TG-M: $.57 / .79$; $d = .72^{***}$) and competence (TG-C: $\Delta M = .90 / SD = .98$; $d = .92^{***}$ vs. TG-M: $.42 / .88$, $d = .48^{**}$). This suggests that the intervention was especially effective in supporting students with less statistical background. In contrast, math students showed almost no change in perceived difficulty ($\Delta M = .03 / SD = .86$, $d = .04$, n.s.), while civics students reported a large reduction in perceived difficulty ($\Delta M = .69 / SD = .84$, $d = .81^{***}$). The belief that mathematics is essential for understanding statistics (Math4Stats) showed diverging effects: civics students reduced their agreement with this belief ($\Delta M = -.61 / SD = 1.69$; $r = .35^*$), while math students slightly increased it ($\Delta M = .24 / SD = 1.38$; $r = .13$, n.s.). This may reflect a growing statistical confidence among civics students.
- For *information-related efficacy*, both subgroups improved significantly with strong effects (TG-M: $\Delta M = .23 / SD = .50$; $d = .47^{**}$ vs. TG-C: $.25 / .37$; $d = .69^{**}$). *Trust in science* increased modestly in both groups (TG-M: $\Delta M = .26 / SD = .68$; $r = .35^*$ vs. TG-C: $.25 / .64$, $r = .36$, n.s.) but was only statistically significant among math students. This suggests that data-oriented, interdisciplinary learning may strengthen scientific trust even among students less oriented toward civic or social science discourses.
- *General political dispositions* improved in both groups. However, math students showed stronger gains in *political interest* ($\Delta M = .45 / SD = .86$, $r = .46^{**}$) than civics students ($\Delta M = .21 / SD = .74$, $r = .27$, n.s.), whose already high pre-score and notably low standard deviation suggest a ceiling effect, limiting the measurable room for further improvement (see Figure 1, above). Math students also improved more strongly on the *political self-concept* ($\Delta M = .40 / SD = .60$, $r = .58^{***}$) than their civics counterparts ($\Delta M = .20 / SD = .44$; $d = .45^{**}$), indicating that the civic framing of statistical learning may have especially resonated with this group.

Limitations

While the study provides promising insights into the potential of interdisciplinary learning formats for fostering civic statistical literacy, several limitations must be acknowledged. First, the sample size of the subgroups (separated by subject and treatment/control group) limits the statistical power of some comparisons and restricts generalizability. Second, dropout rates between pre- and post-assessments varied across cohorts, ranging from approximately 5% to 30%. Selective attrition cannot be ruled out and may introduce bias. Third, all data were self-reported, which may be affected by social desirability or self-perception bias. Finally, the specific institutional context of a German teacher education university may limit the applicability of the findings to other settings.

CONCLUSION

The results provide initial evidence that interdisciplinary formats not only enhance statistical competence and confidence but also foster civic awareness. At baseline, math students reported more positive affective attitudes toward statistics, while civics students showed higher political attitudes and greater confidence in information-seeking. The intervention helped to mitigate these asymmetries. Civics students made particularly strong gains in statistical attitudes, suggesting that data-rich, exploratory tasks can effectively support learners with limited prior experience. Conversely, math students increased their interest in political issues, indicating that data can serve as a meaningful bridge between disciplinary domains. The gains in trust in science and political efficacy across both groups underscore the broader civic impact of data-oriented learning.

These findings suggest that interdisciplinary, inquiry-based learning can help prepare future teachers to foster critical data engagement in their own classrooms. Further studies with larger samples and longitudinal follow-ups are needed to validate and expand these insights.

REFERENCES

- Awe, O. O., Love, K., & Vance, E. A. (2022). *Promoting statistical practice and collaboration in developing countries*. CRC Press. <https://doi.org/10.1201/9781003261148>
- Behm, T. (2018). SES-IB-16. Skala zur Erfassung der informationsverhaltensbezogenen Selbstwirksamkeitserwartung. In Leibniz-Institut für Psychologie (Ed.), *Open Test Archive*. Trier: ZPID. <https://doi.org/10.23668/psycharchives.4598>
- Beierlein, C., Kemper, C. J., Kovaleva, A., & Rammstedt, B. (2014). Political Efficacy Kurzsкала (PEKS). *Zusammenstellung sozialwissenschaftlicher Items und Skalen (ZIS)*. <https://doi.org/10.6102/zis34>
- De Mesquita, E., & Fowler, A. (2021). *Thinking clearly with data: A guide to quantitative reasoning and analysis*. Princeton University Press.
- Engel, J., Weber-Stein, F., & Kleinknecht, D. (2025). Zivilstatistische Datenkompetenz in Zeiten von Fake News: Konzept, Unterrichtsdesign und Implementierung im Lehramtsstudium. *Mathematica Didactica*, 48(2). <https://doi.org/10.18716/ojs/md/2025.2245>
- Gal, I., Nicholson, J., & Ridgway, J. (2022). A conceptual framework for civic statistics and its educational applications. In J. Ridgway (Ed.), *Statistics for empowerment and social engagement: Teaching civic statistics to develop informed citizens* (pp. 37–66). Springer.
- Kastorff, T., Müller, M., Selva, C., Greiff, S., & Moser, S. (2025). *Fake News oder Fakten? Wie Jugendliche ihre digitale Informationskompetenz einschätzen und welche Rolle Schulen und Lehrkräfte dabei spielen: Erkenntnisse aus PISA 2022*. Waxmann. <https://doi.org/10.31244/9783830999935>
- Louie, J., Stiles, J., Fagan, E., Chance, B., & Roy, S. (2022). Building toward critical data literacy with investigations of income inequality. *Educational Technology & Society*, 25(4), 142–163.
- McGrew, S., Breakstone, J., Ortega, T., Smith, M., & Wineburg, S. (2018). Can students evaluate online sources? Learning from assessments of civic online reasoning. *Theory & Research in Social Education*, 46(2), 165–193. <https://doi.org/10.1080/00933104.2017.1416320>
- Qiao, C., Chen, Y., Guo, Q., Wu, Q., Wang, C., & Guo, J. (2024). Understanding science data literacy: A conceptual framework and assessment tool for college students majoring in STEM. *International Journal of STEM Education*, 11(1), Article 25. <https://doi.org/10.1186/s40594-024-00484-5>
- Ridgway, J. (Ed.). (2022). *Statistics for empowerment and social engagement: Teaching civic statistics to develop informed citizens*. Springer.
- Schau, C. (2003). *Students' attitudes: The "other" important outcome in statistics education*. Paper presented at the Joint Statistical Meetings, San Francisco, CA. <http://evaluationandstatistics.com/JSM2003.pdf>
- Schüller, K., Busch, P., & Hindinger, C. (2019). *Future skills: Ein Framework für Data Literacy – Kompetenzrahmen und Forschungsbericht* (Arbeitspapier Nr. 47). <https://doi.org/10.5281/zenodo.3349865>
- Shreiner, T. L., & Dykes, B. M. (2021). Visualizing the teaching of data visualizations in social studies: A study of teachers' data literacy practices, beliefs, and knowledge. *Theory & Research in Social Education*, 49(2), 262–306. <https://doi.org/10.1080/00933104.2020.1850382>
- Weber-Stein, F., & Engel, J. (2025). Implementing statistical literacy in civics teacher education. *Journal of Political Science Education*. <https://doi.org/10.1080/15512169.2025.2483786>
- Weiland, T. (2017). Problematizing statistical literacy: An intersection of critical and statistical literacies. *Educational Studies in Mathematics*, 96, 33–47. <https://doi.org/10.1007/s10649-017-9764-5>
- Wissenschaft im Dialog. (2023). *Wissenschaftsbarometer 2023*. <https://wissenschaft-im-dialog.de/projekte/wissenschaftsbarometer/#erhebung-2023>