

10-2020

## **A Virtual Internship to Prepare High School Students for Civic and Political Action**

Jason A. Chen

Jeremy D. Stoddard

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## 1 DEVELOPMENT ARTICLE

2 **A virtual internship to prepare high school students for civic**  
3 **and political action**4 Jason A. Chen<sup>1</sup> · Jeremy D. Stoddard<sup>2</sup>

5 Accepted: 22 October 2020

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7 **Abstract**

8 We explored the impact of participating in a Virtual Internship (VI) computer-supported  
9 collaborative learning simulation, on high school students' (n=43) development of knowl-  
10 edge and skills for critiquing the political media with which they engage. Second, we  
11 evaluated the effect of this intervention on students' self-efficacy for using specific media  
12 strategies to take political action. Finally, we explored the epistemic (knowledge-seeking)  
13 and non-epistemic aims that students set for themselves while participating within our VI,  
14 which was designed specifically to address students' epistemic cognition. Analyses of both  
15 the quantitative and qualitative data revealed that students: (1) evinced gains in knowl-  
16 edge about what "fracking" is and also knowledge about why it is a controversial topic; (2)  
17 evinced gains in self-efficacy for civic engagement—a key indicator to students' likelihood  
18 for acting; and (3) were able to understand the politicized nature of a social media post, and  
19 therefore reported wanting to pursue knowledge-seeking goals to understand both sides of  
20 the argument and the trustworthiness of the information sources. We discuss these results  
21 vis-à-vis the literature on epistemic games, which can help students develop the knowl-  
22 edge, skills, identity, and values of a profession.

23 **Keywords** Epistemic cognition · Self-efficacy · Epistemic games · Democratic education ·  
24 Civic engagement

25 We explored changes in high school students' (n=43) knowledge about a policy issue  
26 ("fracking" in this case) and why the issue is controversial, while they participated in a  
27 Virtual Internship (VI) computer-supported collaborative learning simulation. Second, we  
28 explored changes in the students' self-efficacy for using specific media strategies to take  
29 political action. Finally, we explored the epistemic (knowledge-seeking) and non-epistemic  
30 aims that students set for themselves while participating within our VI, which was designed  
31 specifically to address students' epistemic cognition. Analyses of both the quantitative  
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A1 ✉ Jason A. Chen  
A2 jachen@email.wm.edu

A3 <sup>1</sup> William & Mary School of Education, 301 Monticello Avenue, Williamsburg, VA 23187, USA

A4 <sup>2</sup> Department of Curriculum & Instruction, School of Education, University of Wisconsin Madison,  
A5 225 North Mills Street, Madison, WI 53706, USA

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38 the literature on epistemic games, which can help students develop the knowledge, skills,  
39 identity, and values of a profession.

#### 40 **The challenges of developing citizens for contemporary times**

41 Politics in the United States is currently highly polarized and partisan. This partisanship is  
42 partly being fueled by the rise of money in politics to persuade citizens by using both tradi-  
43 tional and new media networks. Rich and Kavanagh (2018) have labeled the effects of polari-  
44 zation and shifting views of journalism as “Truth Decay.” They argue that a growing distrust  
45 in traditional media and governmental institutions, and the blurring between fact and opinion,  
46 is partly a result of our current media and political ecosystems. Further, Kahne and Bowyer  
47 (2017) found that young people (ages 15–27) tend to view political messages that align with  
48 their views as accurate, and those they disagree with as inaccurate. Even worse, the effect  
49 was amplified for those with higher levels of political knowledge. This phenomenon is hardly  
50 unique to young people—it can be observed with older adults also, which Kahne and Bowyer  
51 noted.

52 This presents a major challenge for the field of democratic education: Not only are schol-  
53 ars wrestling with preparing young people to participate effectively in the democratic pro-  
54 cess, but they are also interested in how to prepare young citizens to evaluate media messages  
55 and to communicate, coordinate, and take action within the current political media ecosystem  
56 (Stoddard 2014). Here we are talking about an understanding of how political views shape  
57 media, going beyond the kind of verifying and authority analysis of media sources more often  
58 encountered in K-12 education (e.g. Caulfield 2017; Wineburg et al. 2016). We also want stu-  
59 dents to recognize the role and political perspectives of journalism within the overall political  
60 media ecosystem.

61 Given these problems, two goals drove our research. First, we explored changes in high  
62 school students’ self-efficacy, knowledge, and skills for critiquing political media while they  
63 participated in *PurpleState*, which is a computer-supported, collaborative, virtual internship  
64 (VI) designed by the second author. Second, we explored the goals that students pursue while  
65 participating within our VI, which was designed to address students’ cognitions about the  
66 nature of knowledge and knowing. These cognitive processes, called epistemic cognition, are  
67 a central feature of critical thinking (Hofer, 2016), which was a central design consideration  
68 in producing *PurpleState*. Both Kahne and Bowyer (2017) and Rich and Kavanagh (2018)  
69 advocated for including opportunities to engage critically with political media in school as  
70 an antidote to political misinformation. Kahne and Bowyer found that participants who had  
71 some training in media literacy were more likely to recognize misinformation as inaccurate.  
72 *PurpleState* is our attempt to address this gap.

## 73 Literature review: games, simulations, and technology 74 in contemporary civic education

75 One popular approach for developing students' political engagement and socialization has  
76 been the use of games and simulations (Gould 2011; Parker et al. 2011, 2013; Wright-  
77 Maley 2015). Historically, these were simulations such as a United States (U.S.) moot  
78 Supreme Court where students play the roles of justices, petitioners, and appellants, or  
79 simulations where students play the roles of members of Congress to learn the legislative  
80 process. Parker and colleagues (Parker et al. 2011, 2013, 2017; Parker & Lo 2016) created  
81 a set of classroom-based simulations (e.g. election, congressional, supreme court) as part  
82 of re-envisioning the Advanced Placement (AP) U.S. Government curriculum "for students  
83 to 'experience' government and politics while also studying them intensively, learning to  
84 act and acting to learn in tandem" (Parker et al. 2013, p. 1426). They have shown that,  
85 compared to their peers in control conditions, students who participated in the intervention  
86 curriculum scored at least as well on the AP U.S. Government test (an assessment that pri-  
87 marily measures students' memory recall regarding the structures and functions of govern-  
88 ment). Even more important is that they evinced a deeper understanding of the content and  
89 of the types of skills necessary for democratic citizenship such as engaging in controversial  
90 issues (Parker et al. 2013, 2017).

91 *iCivics*, a civic education organization founded by former U.S. Supreme Court Justice  
92 Sandra Day O'Connor, epitomizes a game-based strategy for engaging young people in  
93 being active, informed, and engaged citizens. Their web-based games are used by thou-  
94 sands of mostly middle-grades students across the United States. There is limited research  
95 regarding its effectiveness. In a study of a six-week program, which included playing  
96 some *iCivics* games for at least an hour a week, middle school students evinced significant  
97 gains on test items from the U.S. citizenship exam and Texas state testing content (TEKS;  
98 Blevins et al. 2014). They also found that the teacher's actions were linked to the quality of  
99 students' experiences (LeCompte, Moore, and Blevins 2011).

100 Nevertheless, an analysis of four of the *iCivics* games by Stoddard et al. (2016) found  
101 that the games' overemphasis on textbook content in their design led students to (a) think  
102 too simplistically about U.S. government processes, and (b) develop a naïve understanding  
103 of the role of prominent figures (e.g. Supreme Court Justice). They also found that games  
104 purporting to engage students in controversial issues presented limited perspectives on  
105 issues and therefore emphasized particular ideological views on controversial public policy  
106 issues.

107 Other technology-enabled simulations and games include some realistic or dynamic ele-  
108 ments. For example, in *Government in Action* (McGraw-Hill Practice) students take on the  
109 role of a new House member in the U.S. Congress, and interact with members of other  
110 government branches. They also engage in activities that go beyond the textbook by inter-  
111 acting with lobbyists and gaining influence. However, the simulation reinforces the hierar-  
112 chy and official structures of government. In a different approach to this content, the virtual  
113 internship (VI) simulation *Legislative Aid* places students in the role of aids for members  
114 of Congress. In a pilot study of the simulation, Poole et al. (2010) found that participating  
115 in the VI simulation developed students' skills, knowledge, and values aligned with the  
116 role (see also, Bagley & Shaffer 2009).

117 As illustrated, most simulations and games place students in positions of power, such as  
118 a Supreme Court Justice or member of Congress. As a result, students may not fully under-  
119 stand the dynamic nature of politics, the influence of outside groups, or the political media

120 ecosystem. All of which are keys to understanding how to effect change as a citizen (Stod-  
121 dard 2014). Furthermore, the simulation studies that engaged students in civic or political  
122 roles, such as the work of Parker and colleagues or those studying the effects of *iCivics* did  
123 not examine the impact on participants' self-efficacy for political engagement—one of the  
124 key predictors for future civic engagement (Levy 2011). Developing this self-efficacy for  
125 engaging in the political process outside the classroom entails the transfer of competencies  
126 learned in school to actions that students enact outside of school. For this type of transfer to  
127 happen, students need to learn these competencies within contexts that are authentic to the  
128 contexts in which they are likely to find themselves, such as on social media sites (Raphael  
129 et al. 2010).

## 130 Theoretical groundings

### 131 Epistemic cognition

132 Hofer (2016) noted that, “at a time when technology has exponentially enhanced our access  
133 to information, epistemic cognition researchers have recognized that information and  
134 digital literacy are fundamentally epistemological issues” (p. 29). Furthermore, Sandoval  
135 (2016) argued that researchers need to explore in greater depth, “how students' engagement  
136 in disciplinary practices affects how they come to understand the nature of particular disci-  
137 plines” (p. 189). For these reasons, we sought to understand how students' engagement in  
138 civic education practices within a technology-rich curriculum facilitated their understand-  
139 ing about the nature of political communications.

140 According to Chinn, Rinehart, and Buckland (2014), epistemic cognition refers to the  
141 large array of cognitive phenomena that lead people to achieve such things as knowledge,  
142 understanding, and useful models. For example, if young people come across a politi-  
143 cal advertisement and seek more information to see if it is relevant to their lives, they are  
144 engaging a number of cognitive resources (i.e. epistemic cognition) that lead them to an  
145 understanding of a political issue. Although epistemic cognition includes many constructs,  
146 we focus only on one aspect of epistemic cognition because it is especially pertinent to our  
147 work with *PurpleState*.

### 148 Epistemic aims

149 Given the wide autonomy that students are often presented with in social media spaces,  
150 there is a great need to examine the types of goals that students set for themselves when  
151 they try to understand the political media that they see. We focus specifically on epis-  
152 temic aims, which “are a subset of the goals people adopt, specifically those goals related  
153 to inquiry and finding things out” (Chinn et al. 2011, p. 142). Nonepistemic aims, on the  
154 other hand, have nothing to do with attaining knowledge or understanding. For example,  
155 some people look for and post news articles onto their social media feeds just to signal  
156 to others what their political leanings are rather than to pursue knowledge. According to  
157 Chinn et al.'s (2011) model of epistemic cognition, epistemic aims set up individuals for  
158 what types of activities they are likely to engage in next. Instructional cues that prompt stu-  
159 dents to inquire and find things out are likely to set students up for epistemic aims, whereas  
160 instructional cues that direct students' attention away from knowledge-seeking endeavors  
161 are likely to set students up for non-epistemic aims (Chinn et al. 2011).

## 162 Self-efficacy for civic engagement

163 Understanding the nature of political communications is one issue, but believing in one's  
164 own capabilities (i.e. self-efficacy) to engage productively in political discussions with  
165 others, is quite different. This self-efficacy for civic engagement is a key factor in young  
166 people being able to participate in civic life (Levy 2011). A survey from Common Sense  
167 Media (Robb 2017) revealed that only 44% of teenagers reported being confident in dis-  
168 cerning fake news from real news. Research also indicates that young people (and adults)  
169 struggle to identify the authenticity, accuracy, and quality of online sources (Flanagin &  
170 Metzger 2007; Fogg 2003; Kahne & Bowyer 2017; Metzger, Flanagin, & Medders 2010).  
171 *PurpleState* was designed around a local political topic so that we could explore whether  
172 developing political communications skills about a more local focus could build students'  
173 self-efficacy for civic engagement.

174 Our goal was to examine how participating in a VI can foster knowledge of a contro-  
175 versial political issue and the self-efficacy to engage in civic and political action. This is a  
176 unique contribution because much of the literature on games and simulations is focused on  
177 STEM subjects. *PurpleState* is designed specifically for a social studies classroom, where  
178 epistemic cognition plays a critical role in how students approach their learning (Hofer  
179 2016).

## 180 Epistemic games mobilize epistemic cognition and self-efficacy

181 *PurpleState* was designed using the epistemic game model of virtual internships devel-  
182 oped by Shaffer (2006a, 2006b). Epistemic games model learning by providing a simu-  
183 lated community of practice (Lave & Wenger 1991) for students to interact with others  
184 in a learning environment modeled on the practices and values of a professional commu-  
185 nity. These simulated communities of practice are structured to develop students' expertise  
186 and professional identity, which facilitates knowledge and skill development specific to a  
187 profession, and ultimately helps learners internalize the values of these practices (Shaffer  
188 2006b). These simulated communities of practice are related to what Shaffer (2006b) calls  
189 the epistemic frame—the skills, knowledge, values, and identity of a professional practice.  
190 Thus, the epistemic frame engages students in solving complex authentic problems using  
191 the tools, information, values, and identity of a profession. In this way, epistemic games fit  
192 the criteria set for simulations within social studies education (Wright-Maley 2015).

193 For example, to model the epistemic frame of an engineer, players would be immersed  
194 in a virtual environment with others, where players would have to think and act in the ways  
195 an engineer would on problems that engineers would tackle. As virtual interns, students  
196 work in these epistemic games with other interns and expert mentors to engage in authen-  
197 tic issues or problems within a computer-supported collaborative learning environment  
198 designed for the VIs. This experience promotes epistemic understanding in addition to  
199 knowledge and skill building (Nash & Shaffer 2013).

200 The concept of epistemic frames provides a model that could help students transfer  
201 their academic experiences to their role as citizens outside of school (Bagley & Shaffer  
202 2009; Shaffer 2006a, 2006b). Therefore, an “epistemology of professional practice” may  
203 be a better model for democratic education than an epistemology based on an academic  
204 discipline such as history. Here we use an epistemic frame of a political media strate-  
205 gist as a way to help participating students better understand the decisions being made



206 by politicians and media companies to influence the public. We argue that the epistemic  
207 frame of a VI develops students' awareness of the political media ecosystem, which they  
208 interact with constantly outside of school. We use this frame not because we want them  
209 to become media consultants but because this expertise is valuable when transferred to  
210 their role as informed citizen.

211 *PurpleState* was designed to mobilize students' epistemic cognition by presenting  
212 students with decision points in which they are compelled to seek out relevant knowl-  
213 edge (i.e. why do some people in rural areas oppose "fracking" and why do others in  
214 the same area support it?) so that they can come to a better understanding of the politi-  
215 cal landscape and justify their decisions to their team. By structuring *PurpleState* in  
216 such a way, our goal is to authentically compel students to pursue epistemic aims (i.e.,  
217 understand why some rural voters oppose fracking) rather than nonepistemic aims (i.e.  
218 how do I answer this question so that I can just get through this game?). By pursuing  
219 epistemic aims, students engage a number of cognitive resources (e.g. inquiry) that lead  
220 them to an understanding of a controversial political issue.

221 By directing students toward knowledge-seeking behaviors within the context of  
222 political media communications, we are also helping students to develop the self-effi-  
223 cacy for engaging in conversations about controversial political issues. Students have to  
224 wrestle with why people support and oppose the issue, and how to engage productively  
225 in a conversation with someone who disagrees with them. These are all skills that can  
226 bolster students' self-efficacy for civic engagement.

227 We also designed the simulation to teach students to understand both sides of a  
228 controversial issue, in this case whether or not fracking should be done in Virginia.  
229 Understanding both sides of a controversial issue is important because it helps students  
230 understand that reasonable people can disagree on issues, which is a key element of  
231 democratic deliberation. Therefore, the values of deliberative democracy would sug-  
232 gest a "best case, fair hearing of competing points of view" (Kelly 1986) that students  
233 engage in while participating in *PurpleState*.

## 234 Research questions and hypotheses

235 The following two research questions (RQ) and hypotheses (H) guided our inquiry:

236 **RQ1:** What changes are evident in students' knowledge of political issues and  
237 self-efficacy for political engagement after participating in the VI?

238 **H1:** Given the framework and theoretical groundings used to design *PurpleState*  
239 we hypothesized that students would become more knowledgeable about "frack-  
240 ing" (hydraulic fracturing) and why it is controversial. We also hypothesized that,  
241 with a more developed understanding and knowledge base of a controversial topic,  
242 students would be more self-efficacious in discussing this topic.

243 **RQ2:** When faced with political media regarding a controversial topic, what epis-  
244 temic and non-epistemic aims do students set regarding the content of this politi-  
245 cal media?

246 **H2:** Because of the exploratory nature of this question, we do not forward any spe-  
247 cific hypotheses regarding the epistemic and non-epistemic aims students would  
248 pursue when faced with political media.

## 249 Research design and methods

250 The purpose of this study was to explore whether and how students' knowledge of political  
251 issues and their self-efficacy for political engagement changed while they engaged in  
252 *PurpleState*. We also were interested in the types of knowledge-seeking goals (i.e. epis-  
253 temic aims) that students reported they would pursue if they came across political adver-  
254 tisements in social media regarding energy production, and whether these epistemic aims  
255 changed after participating in *PurpleState*. We employed an embedded mixed-methods  
256 design (Creswell 2008) to examine changes in participants' self-efficacy, epistemic aims,  
257 and knowledge. An embedded design allowed us to take advantage of the strengths of both  
258 quantitative and qualitative data (Creswell 2008). Therefore, the quantitative measures  
259 and scored qualitative items focused on measuring outcomes such as knowledge and self-  
260 efficacy. They were supplemented by qualitative data collected during the simulation that  
261 allowed the researchers to understand how participants experienced the simulation.

262 We report on data collected as part of the third and final iteration of *PurpleState's*  
263 implementation. For information on other iterations of this process see Stoddard and Rod-  
264 riguez (2019). Our team included experts from political communications, civics education,  
265 learning sciences, and educational psychology, and partner teachers. This design-based  
266 approach allowed us to develop the simulation iteratively in response to data we collected  
267 throughout the curriculum implementation (Brown 1992; Dede 2004). This approach also  
268 helped us evaluate how students' knowledge, skills, and self-efficacy changed as they par-  
269 ticipated in the 10-h curriculum.

## 270 Implementing *PurpleState*

271 *PurpleState* is modeled on a political campaign and public affairs firm with which one  
272 member of our design team had experience. Tasks, products, and concepts/terminology in  
273 the internship are derived from the work of actual interns in the firm he worked for. We  
274 also utilized experts from political communications and political behavior; high school civ-  
275 ics and government curricula (e.g. textbooks); one author's extensive background in media  
276 literacy and democratic education; and research on youth participatory politics in the  
277 United States and Europe (e.g. Banaji, Buckingham, Van Zoonen, & Hirzalla 2009; Kahne  
278 et al. 2014). The balance between authenticity and functionality, along with maximum par-  
279 ticipation and engagement of students, was prominent in our design.

280 *PurpleState* takes roughly ten hours to complete, and can be done completely in class,  
281 or in a combination of in-class and out-of-class time. Participants are divided into collabo-  
282 rative teams of interns, and work with an account manager (played by a graduate student)  
283 who serves as an online mentor. Participants begin by viewing a video from "John" the  
284 non-player character and their boss at *PurpleState*. They then complete their pre-inter-  
285 vention survey and learn about the online work environment, WorkPro. WorkPro is struc-  
286 tured similarly to a project management system and allows students to (a) receive emails  
287 from John outlining tasks; (b) participate in chat discussions with their team members and  
288 account managers (online mentors); (c) access and share materials and tasks; and (d) sub-  
289 mit deliverables. When students finish participating in *PurpleState* they complete a post-  
290 intervention survey in WorkPro.

291 The first series of tasks introduces participants to *PurpleState's* Campaign Design Man-  
292 ual, which outlines key concepts and processes in political communications (e.g. strategies



293 for reaching target voters). They then apply these concepts through a series of tasks that  
294 also support mastery learning through facilitated reflective meetings and requests for  
295 revised tasks with feedback.

296 The second series of tasks then engages students in a collaborative project. They are  
297 told that a request for proposals (RFP) was received for a media campaign either for or  
298 against a proposed state ban on fracking. This was a controversial public policy issue at the  
299 time nationally, and particularly in Virginia where the original simulation was developed.  
300 To make the issue also relevant to Wisconsin, which is one of the largest suppliers of sand  
301 used in the fracking process, we included additional sources from Wisconsin media on the  
302 role of fracking in the state. The team then developed a media campaign proposal for one  
303 of two special interest groups (depending on which side of the issue they are assigned),  
304 a petroleum industry trade association or an environmental special interest group. This  
305 proposal emphasizes political media strategy and a deep understanding of fracking, which  
306 is fostered through individual and collaborative research tasks, reflective meetings where  
307 strategy is discussed and deliberated, and the construction of a proposal for their client.  
308 Structures built into WorkPro, such as feedback from the account manager, support partici-  
309 pants throughout the VI.

310 Finally, *PurpleState* was designed to be computer-based because we wanted to engage  
311 students in the medium that is authentic to the job: an intern at a political PR firm. In doing  
312 this kind of job students used static GIS maps to explore county-level data from the state  
313 of interest. Finally, there was an online mentor who was giving feedback in real-time to  
314 students. Having these online mentors allowed for personalized feedback and structured  
315 reflective group discussions.

### 316 **Sample and research context**

317 A total of 43 Grade 9 students participated in the study. They came from two course sec-  
318 tions at a junior high school (housing Grades 8–9) in a mid-sized school district serving  
319 several small cities in central Wisconsin (U.S.A). The total number of students in the  
320 school district was roughly 6000 during the year the study took place. The two sections  
321 where *PurpleState* was implemented included a civics course (n=26) and an AP U.S. Gov-  
322 ernment course (n=17). The junior high school was the only school in the district that was  
323 labeled as exceeding expectations on achievement measures set by the Wisconsin Depart-  
324 ment of Public Instruction. The ethnic makeup of the students at the school include 81%  
325 White, 12% Asian American, 1% African American, 3% Latina/o, 2% multi-racial. Ten  
326 percent of students had officially identified disabilities and 3% were English Language  
327 Learners. Finally, 25% of students in the district came from families designated as eco-  
328 nomically disadvantaged.

329 The participants engaged in *PurpleState* over a three-week period and the researchers  
330 worked closely with the teacher to collaborate on helping all students succeed, including  
331 the two ESL students and several students with special needs in one class. At the time  
332 of the study James (a pseudonym for our school partner to preserve confidentiality) had  
333 taught for over 5 years at the school. *PurpleState* was implemented as part of the regular  
334 classroom curriculum, and all students assented to participate in data collection.

### 335 Data generation and instruments

336 Given our research questions, we used a 37-item instrument to assess students' self-efficacy  
337 for civic engagement, knowledge of fracking, and epistemic aims. We worded the items  
338 to ensure they were specifically focused on political engagement, the role of media, and  
339 issues of fracking. In the current study we did not include other items from this instrument  
340 because their psychometric properties were poor or they were not relevant for this present  
341 study. Our pre- and post-intervention surveys were distributed to students using Qualtrics  
342 immediately before (at Week 1) and after the VI (at Week 3). See Appendix A for a list of  
343 all items used in the present study.

### 344 Self-efficacy for civic engagement

345 In developing the items for this particular study, we followed procedures consistent with  
346 Bandura's (2006) recommendations on constructing self-efficacy items. Students' confi-  
347 dence for being able to engage in political issues was measured before and after participa-  
348 tion in *PurpleState* using a 10-item instrument [ $\alpha=0.89$ (pre),  $0.95$ (post)]. The tasks iden-  
349 tified for civic engagement centered on: (1) discussing political issues and constructing  
350 good arguments; (2) critically navigating digital media spaces that contain political mes-  
351 sages; and (3) taking some sort of political action. Although these items do not comprise a  
352 comprehensive list of civic engagement activities, they do specifically address the central  
353 activities of *PurpleState*.

### 354 Epistemic aims

355 Students read a memorandum from a polling company, which was sent to a climate change  
356 network regarding Maryland residents' views about fracking in Maryland. To assess stu-  
357 dents' epistemic aims we asked students to view the memo, and report what they are likely  
358 to do next with this memo if they came across it while they were on social media (e.g.  
359 Facebook). In this response, they rank-ordered their choices from "most likely to do" to  
360 "least likely to do." The choices included (a) Look for more information about the poll-  
361 ing agency; (b) Learn more about the topic of fracking; (c) Find out more information  
362 about the recipient of the memo; (d) Do nothing with it and move on to something else;  
363 (e) Re-post the memo on social media; (f) Look for multiple polling results concerning the  
364 topic. Students were then asked to provide open-ended responses to their top two choices  
365 and comment on "why you might be inclined to do those things." We coded participants'  
366 responses to this open-ended question for the inclusion of epistemic aims (i.e. goals related  
367 to knowledge-seeking) or non-epistemic aims (i.e. goals not related to knowledge-seeking).  
368 We then further coded those epistemic and non-epistemic aims to identify what specifically  
369 they were (e.g. looking up more information about the polling organization).

### 370 Knowledge of fracking

371 Two questions that required an open-ended response were used to assess students' knowl-  
372 edge of fracking. First, we asked students to describe in as much detail as possible the  
373 process of fracking. One of the authors of the study and a graduate assistant coded the

374 responses on a scale from one to four. Second, we asked students why fracking is consid-  
375 ered a controversial public policy issue in the United States. Responses were also coded  
376 from one to four.

377 For both of these open-ended knowledge items, an initial sample of ten responses for  
378 each item (23%) from the pre- and post-intervention surveys (randomly selected) were dou-  
379 ble scored by one of the authors and a graduate student to assess consistency in scoring  
380 and inter-rater agreement. There was a 90% rate of agreement on this initial scoring. For  
381 responses where there was disagreement, they were within one point of difference and two  
382 raters resolved the differences in scoring. The graduate assistant then scored the remaining  
383 items.

### 384 Data analysis

385 Recall that for the first research question we explored the relationship between participat-  
386 ing in *PurpleState* and changes in students' knowledge about the issue of fracking and its  
387 controversies and students' self-efficacy for civic engagement. We conducted a depend-  
388 ent samples *t*-test to explore change from pre- to post-intervention on knowledge and  
389 self-efficacy.

390 The qualitative data from open-ended items on the pre- and post-intervention surveys  
391 were scored using the developed rubrics described earlier. These responses and the qualita-  
392 tive data included the online chat discussions, participant task submissions, and notes gen-  
393 erated by the research team. These data were then coded line by line with a coding scheme  
394 developed from key terms and concepts from the simulation, with additional codes pro-  
395 duced inductively as needed following a grounded theory approach (Charmaz 1995; Glaser  
396 & Strauss 1967).

### 397 Results

398 Recall that our first research question (RQ) addressed how students' knowledge and self-  
399 efficacy changed over the duration of the intervention. Our second RQ explored the variety  
400 of epistemic and non-epistemic aims that students pursued, and how they changed as they  
401 participated in *PurpleState*.

#### 402 RQ1: changes in knowledge and self-efficacy

403 Table 1 shows descriptive statistics of the main variables in our study. Our analy-  
404 sis of the impact of participating in the VI revealed changes from pre- to post-inter-  
405 vention regarding knowledge of fracking  $t(41) = 13.23, p < 0.0001, d = 4.13$ , and why

Table 1 Changes in Pre- to Post-Intervention Variables

Variable name	N	T0 Mean	T3 Mean	SD $M_{T3} - M_{T0}$	<i>t</i> -value	<i>p</i> -value	Cohen's <i>d</i>
Fracking knowledge	42	1.5	3.0	0.77	13.23	< 0.0001	4.13
Fracking controversy knowledge	41	1.7	2.9	1.02	4.21	0.0002	1.33
Self-efficacy civic engagement	41	3.8	4.3	0.83	3.69	0.0007	1.17

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406 it is controversial  $t(40)=4.21, p=0.0002, d=1.33$ . To provide more context for what  
407 these quantitative changes looked like, we present the following analyses of our quali-  
408 tative data. The examples below illustrate the change in one participant's responses  
409 from the pre- to post-intervention surveys regarding what fracking is and why it is so  
410 controversial.

411 When asked to explain what fracking is, a fairly typical response in the pre-inter-  
412 vention survey was, "I have no idea what fracking is," which was scored a 1 because  
413 it "Fails to convey any specific understanding of the technologies used ... the specific  
414 product (natural gas), or the nature of the process." This same participant's post-inter-  
415 vention survey response illustrates her growth in understanding the process:

416 Hydraulic Fracturing or "Fracking" is the process in which a pipe is drilled a cou-  
417 ple miles down to a certain type of rock called shale and this rock is rich in natural  
418 gas and oil so once the pipe is deep enough to get to the shale rock the pipe is  
419 drilled horizontally and small fissures are made in the rock allowing the natural  
420 gas and oil to make its way into the pipe. Then chemicals and sand are pumped  
421 into the pipe to extract the gas and the oil, then the resources are shipped where  
422 they need to go.

423 This response was scored a 4 as it "Conveys a systematic understanding of the vari-  
424 ous products, processes, and technologies involved in fracking, and how they play out  
425 sequentially."

426 Similarly, the responses to the question, "Why is fracking controversial" included  
427 rather simplistic understandings at pre-intervention, such as, "some people are strongly  
428 for Fracking and others believe it should be left alone, in case it causes harm." This  
429 response was scored a 1 as it "Does not convey accurate knowledge of either the benefits  
430 or costs associated with fracking." However, this same participant's post-intervention  
431 response was scored a 4 as it identifies both the potential costs and benefits of fracking  
432 and provides specific examples for both potential costs and benefits:

433 Fracking is very controversial because it damages the environment by contaminat-  
434 ing our water and polluting our air. Research has also shown more earthquakes in  
435 fracking areas. Fracking is widely viewed as dangerous and bad for the environ-  
436 ment. The opposite argument is that it increases energy and jobs.

437 Throughout the VI, participants are introduced to conceptual tools from political  
438 communications, such as different forms of persuasive messaging and conditions under  
439 which they are most effective. Participants also engage with content related to frack-  
440 ing. This content comes in the form of scientific sources and also general journalistic  
441 sources that include descriptions of the fracking process and its controversy. As part  
442 of the internship, individual tasks cue students to explore and apply their knowledge of  
443 (a) fracking, and (b) the conceptual tools from political communications to plan their  
444 campaign. This succession of tasks, with feedback provided by the account manager,  
445 generally resulted in clearer, more accurate, and well-warranted explanations of what  
446 fracking is and why it is viewed as controversial. The VI was designed to help partici-  
447 pants develop expertise in this way—both in terms of the issue and in skills related to  
448 using evidence and conceptual tools from political communications. To illustrate this,  
449 we show Evan's pre- and post-intervention responses to the question:

450 **Pre-Intervention:** I don't know much about fracking, but I do know that you have  
451 to dig in the ground and extract things. (scored a 1).

452 **Post-Intervention:** Fracking is the process which people drill pipes sometimes a  
453 mile or two into the surface of the Earth, and then the pipe can go [horizontal] a  
454 mile or two, to extract gas from the rocks in the Earth. (scored a 3).

455 In a task that occurred midway through the VI, which prompted him to research and  
456 summarize the fracking process utilizing a number of resources in our WorkPro research  
457 database, Evan provided an even more sophisticated description.

458 **Evan Task:** Fracking is the process of drilling down into the ground before a high  
459 pressure water mixture is directed at the rock to release the gas inside. Materials  
460 like sand, water and other chemicals, are injected into the rock at high pressure  
461 which makes the gas to flow out to the well. Fracking can be conducted vertically,  
462 but mostly likely horizontally, by drilling to the rocky layer to create new path-  
463 ways to release gas. The actual term fracking refers to how the rock is fractured  
464 apart by the high-pressure mixture.

465 In this response, we can see three specific pieces of evidence that directly emerge  
466 from this research in Evan's post-intervention response: Fracking involves (a) horizontal  
467 drilling; (b) the use of long piping; and (c) the extraction of gas from rocks. Evan's shift  
468 in understanding fracking is illustrative of participants in *PurpleState*, most of whom  
469 were quite uninformed or held naïve understandings about the process of fracking prior  
470 to participating in the VI. The most important aspect of this response, however, is the  
471 fact that, because of the prompting from the VI, Evan pursued inquiry-related tasks to  
472 research the issue of fracking. This illustrates how the tasks we designed within the VI  
473 helped develop Evan's understanding of the fracking process.

474 We saw similar shifts in participants' views about why fracking is controversial. In  
475 particular, we were interested in participants' ability to provide arguments for why it  
476 might be controversial from multiple perspectives, even though they were working only  
477 on one side of the issue. As noted above, we saw a statistically significant increase in  
478 participants' knowledge of fracking and their knowledge of why fracking is viewed as  
479 controversial. Students were also more able to provide reasoning for each side of the  
480 issue. We found that participants often had a limited view of the issue from one per-  
481 spective at pre-intervention, but were more likely to provide evidence from both pro-  
482 and anti-fracking perspectives at post-intervention, likely as a result of being asked to  
483 work with this evidence and devise a strategy for their client.

484 One example of this is Summer's pre-intervention and post-intervention response to  
485 the item "why is the use of the fracking process considered a controversial public policy  
486 issue in the U.S?".

487 **Pre-Intervention:** Because some people think it's not good for the environment  
488 and some people do agree that it's non-harmful (scored a 1).

489 **Post-Intervention:** Fracking tends to be a very controversial topic because:

490 (1) Pro fracking- they tend to look at all the goods of it like on how it will save us  
491 money on gas in the future and we can lessen our trading with the Middle East on  
492 where we get our oil, they think that it could possible better our air.

493 (2) Anti-Fracking: they tend to look at the negatives on how it can harm people's  
494 drinking water because the pipelines could leak or the water could end up absorb-  
495 ing into the earth and find its way into a reservoir. It can also be loud and do more  
496 damage in the end (scored a 4).



497 Summer's pre- and post-intervention responses reflect a larger shift than the average  
498 participant. This might, in part, be the result of her role in the research phase of the collab-  
499 orative task, where the team selected specific portions of the research to do, which would  
500 inform their proposal. Her role was to investigate the pro-fracking arguments that could  
501 be used. Then she used this research, and other research completed by her teammates, to  
502 develop the section of the proposal that focused on their overall strategy for their campaign,  
503 integrating the most persuasive arguments and themes for their proposal. When combined  
504 with the collaborative work of their group for an anti-fracking client, these activities likely  
505 influenced her development of a higher-than-average expertise for this particular topic.

506 In addition to exploring changes in students' knowledge of what fracking is and why it is  
507 so controversial, we were interested in the potential impact of *PurpleState* on participants'  
508 self-efficacy to engage politically. If students become more knowledgeable about an issue  
509 and its controversies, would they also be more self-efficacious about engaging produc-  
510 tively in conversations surrounding political topics? We found that students reported higher  
511 self-efficacy after participating in *PurpleState* compared to pre-intervention  $t(40)=3.69$ ,  
512  $p=0.0007$ ,  $d=1.17$ .

### 513 RQ2: do students pursue epistemic aims?

514 The quantitative results illustrate the potential for using VIs to develop the knowledge  
515 and self-efficacy that are considered important for engaging productively in conversations  
516 about controversial political issues. For the second RQ we examined the qualitative data to  
517 explore what aims or goals our sample of junior high school students reported they were  
518 likely to pursue after viewing a political advertisement about energy production, and why.  
519 We were examining changes in their responses—particularly changes in the *reasons* why  
520 they would do what they indicated. Exploring answers to this could give us insights into  
521 students' epistemic and non-epistemic aims.

522 Overall, when asked about what they would most likely do next if they saw the memo  
523 with polling data on it, students evinced minor shifts from pre- to post-intervention. The  
524 most frequently identified first choice at pre-intervention was to "learn more about frack-  
525 ing" ( $n=27$ ) followed by "do nothing" ( $n=7$ ). There was no detectable pattern in partici-  
526 pants' second choice. On the post-intervention survey, there were only small shifts, with 25  
527 still identifying "learn about fracking" as their top choice.

528 Although there were only minor pre- to post-intervention shifts in their top-ranked  
529 choices, students' *rationale* for these choices shifted greatly. We asked the participants to  
530 provide rationales for their top two choices in the ranking activity. As noted earlier, epis-  
531 temic aims were selected overwhelmingly in both the pre- and post-intervention surveys.  
532 For the pre-intervention survey, most participants who indicated some sort of epistemic  
533 aim indicated that they simply knew little about fracking and therefore would not be able  
534 to make any kind of response about the memo without knowing more. For example, one  
535 participant noted that, "I am not 100% sure on what fracking is. I would want to learn more  
536 so I would be educated on the topic/information."

537 On the post-intervention survey, instead of stating that they wanted to learn what frack-  
538 ing is, students assumed the memo had some kind of a political intent and wanted more  
539 specific information so that they could understand the different sides' arguments and the  
540 trustworthiness of the information sources. For example, one participant responded "before  
541 deciding anything I'd want to know more about the topic of fracking so I would understand  
542 why people like and dislike it." Thus, this participant wanted to find out more about both

543 sides' rationales. Others wanted more information to judge the trustworthiness of the infor-  
544 mation sources. For example, one participant noted, "I already know what fracking is, so I  
545 would most likely look to the authenticity of the actual poll." Students like this referred to  
546 the memo assuming that the author of the memo had a political agenda, and that only by  
547 finding more information about the source or by corroborating the evidence in the memo  
548 would the participant be able to decide about its accuracy or what to do with it (i.e. share it  
549 on social media).

550 Finally, one of the reasons that we saw an upward shift in the number of students who  
551 selected "do nothing" as their first choice in the post-intervention survey was their reali-  
552 zation, through participation in *PurpleState*, that the issue of fracking was not salient in  
553 Wisconsin. For example, one participant who selected "do nothing" as a first choice noted,  
554 "Since I live in Wisconsin and this polling data is about Maryland and about fracking  
555 which we don't have in Wisconsin I probably wouldn't be very interested so all I would  
556 do is nothing." The rationale was that, as Wisconsin residents, the issue of fracking was  
557 not personally relevant to them. How might these students' rationale relate to issues of  
558 authenticity and utility, and whether they pursue epistemic versus non-epistemic aims? We  
559 address this next.

## 560 Discussion and implications

561 Our results add to a small but growing base of studies that explore the ways technology-  
562 enabled learning activities engage students in civic education. We noted that most studies  
563 that used games/simulations typically engage students through the lens of an official role  
564 (e.g. member of Congress). But with the outsized role that people and organizations play in  
565 the political process, very few games or simulations help students develop the self-efficacy  
566 or understandings to navigate the highly mediated space of contemporary politics.

### 567 Changes in self-efficacy and knowledge

568 As noted earlier, much of the literature exploring self-efficacy and political engagement  
569 has addressed students' belief that individual political actions can influence the political  
570 process. Such individual political actions can include voting or writing to one's local rep-  
571 resentative. However, with the growth of misinformation campaigns, and the ubiquity of  
572 politics in social media, all of which can present confusing and negative political informa-  
573 tion, young people are likely to experience declines in their self-efficacy for civic engage-  
574 ment (Kahne and Bowyer 2017; Rich & Kavanagh 2018). Because we were concerned  
575 with developing students' knowledge and self-efficacy for navigating contemporary polit-  
576 ical spaces, which often take place within virtual spaces, we saw a need for creating a  
577 technology-enabled learning environment and corresponding measures that were task- and  
578 domain-specific.

579 Self-efficacy scholars have long noted that self-efficacy is best measured at a task-spe-  
580 cific level (Bandura 2006). So in our study, we adapted our self-efficacy measure specifi-  
581 cally to tap into students' confidence in being able to critique political messages, engage  
582 in meaningful discussions about politics, and to do something to address a policy issue.  
583 Because *PurpleState* was designed specifically to address these types of tasks, assessing  
584 students' growth in self-efficacy for this type of civic engagement provides us with a proof-  
585 of-concept that an epistemic game like *PurpleState* can indeed bolster students' knowledge

586 of and their self-efficacy to engage in discourse about controversial policy issues. These  
587 findings contribute to a growing base of literature regarding the effectiveness of mode-  
588 ling learning through a *simulated* community of practice (Lave & Wenger 1991). In such  
589 a model, students interact with others in a learning environment modeled on the practices  
590 and values of a professional community—a political communications firm, in our case.

591 *PurpleState* was designed to develop students' knowledge to identify and use media to  
592 communicate messages about a controversial policy issue to a specific demographic of vot-  
593 ers, and to influence their views on the issue. Building on Shaffer's (2006b) concept of the  
594 epistemic frame, we engaged students in solving complex problems (i.e. influencing voters'  
595 views of a controversial policy issue) using the tools, information, values, and identity of  
596 an intern at a political communications firm. Although our data are only exploratory at this  
597 stage, the research presented here provides preliminary evidence that students can indeed  
598 become more knowledgeable and self-efficacious *within a context such as civic education*.  
599 This is especially notable because knowledge, evidence, and claims in civic education (par-  
600 ticularly regarding political communications) are typically less definite and concrete than  
601 those from STEM fields such as engineering or physics—a domain where the vast majority  
602 of research has been done regarding epistemic games.

603 Finally, we acknowledge that some readers might think our findings showing gains in  
604 knowledge and self-efficacy regarding a topic that students spent 2 weeks immersed in are  
605 “mere truisms that any intelligent person might know without going to the trouble of doing  
606 social or educational research” (Gage 1991). Why bother doing the research if a reasonable  
607 person could infer that students participating in *PurpleState*, which focuses on civics and  
608 political media, would evince gains in self-efficacy and knowledge? Our goal was not just  
609 to show the direction of change in these two constructs (i.e. positive growth), but also the  
610 *magnitude* of change. We found that the effect size was quite large for knowledge and self-  
611 efficacy gains. Students' understanding of what “fracking” is ( $d=4.13$ ) and why fracking  
612 is controversial ( $d=1.33$ ) grew quite substantially. We believe that this finding is helpful in  
613 advancing the literature because it shows practitioners and researchers that students going  
614 through this curriculum evinced quite substantial knowledge gains—all through an inquiry-  
615 based and highly authentic simulation modeled off of the real work of a person employed  
616 in a political campaign. Gains in self-efficacy were also quite substantial ( $d=1.17$ ). Any  
617 reasonable person might infer the direction of the change (i.e. positive), but knowing the  
618 magnitude of this effect is helpful both for researchers and practitioners who might wonder,  
619 “is participating in this virtual internship worth the investment in time and effort to justify  
620 its use?” Given these effect sizes, we believe the answer to that question is “yes.”

## 621 **Virtual internships may prompt epistemic aims while interacting with political** 622 **media**

623 Both Kahne and Bowyer (2017) and Rich and Kavanagh (2018) have called for educational  
624 interventions to address young people's deteriorating trust in the news media and informa-  
625 tion sources, as well as their inability to evaluate these sources. Findings from our study  
626 provide preliminary evidence suggesting that directing students to pursue epistemic aims  
627 (i.e. goals that have to do with knowledge seeking) is an important consideration in design-  
628 ing virtual learning environments such as *PurpleState*. We saw this play out with Evan, as  
629 mentioned earlier, when the VI environment prompted him to research the fracking process  
630 and demonstrate that knowledge. Evan did not appear to embark on this inquiry behavior  
631 spontaneously on his own. Rather, he had to be prompted. But instead of being told to

632 do so from a teacher, the context of the VI along with the social values that are inherent  
633 to the VI seemed to direct Evan's cognitive and motivational resources toward the task  
634 of researching a controversial issue. Evan's case, of course, is tentative and preliminary  
635 evidence.

636 Given our preliminary findings regarding the importance of epistemic aims, along with  
637 prior work demonstrating the importance of epistemic aims in knowledge acquisition  
638 (Chinn, Rinehart, & Buckland 2014), we see an important opportunity for future research.  
639 Scholars and practitioners need more sophisticated ways to assess the (non)epistemic aims  
640 that students pursue when engaged in media sources. Our current method of assessing epis-  
641 temic aims asked students to select an option for what they would do next if they saw a  
642 particular political advertisement in their social media feed. Although this did provide us  
643 with some initial data regarding epistemic aims, future work should use more sophisticated  
644 methods than simply asking what students will do next in a hypothetical situation.

#### 645 **A new epistemic frame for democratic education**

646 As mentioned earlier, prior empirical work exploring the learning and motivational affor-  
647 dances of games and simulations has typically placed students in the role of a person who  
648 has official power (e.g. Supreme Court Justice). Given the problems in translating the lens  
649 of such roles into actionable knowledge that students can apply to their own lives, we  
650 designed *PurpleState* to present an alternative epistemic frame for students to engage in  
651 democratic education. With *PurpleState*, we focused on a professional role in which tasks,  
652 knowledge, and beliefs align closely with what democratic educators want young people to  
653 know and be able to do within contemporary political contexts and realities. Social media  
654 networks are one of the major mediums where influential political groups engage with the  
655 public. The results from this study provide preliminary and tentative evidence that a VI can  
656 develop students' self-efficacy to act in ways that are consistent with the epistemic values  
657 of being an informed and active citizen such as to closely examine local political issues,  
658 and to leverage social media strategically to persuade others. Finally, by engaging students  
659 in a VI like *PurpleState*, educators can couch their learning activities in a specific epis-  
660 temic frame that allows students to develop the specific epistemic values of a professional,  
661 and to pursue the epistemic aims that such professionals typically pursue.

#### 662 **Limitations**

663 There are a number of limitations that we acknowledge. First, although our data were col-  
664 lected within a technology-rich learning context, all of our data are self-reported from stu-  
665 dents. Second, because this was a pilot project, we only report on a sample of 43 students  
666 attending a school in Wisconsin. Therefore, generalizing findings from this study should  
667 be done with great caution, especially given the demographics of both our sample and the  
668 population from where we drew the sample. Finally, this was not an experimental design.  
669 Therefore, no assumptions can be made about whether particular design decisions caused  
670 certain student outcomes. Researchers would do well to experimentally manipulate spe-  
671 cific design features and include a larger and more diverse sample of students to provide  
672 stronger evidence of causality.

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## 673 **Conclusion**

674 If an important educational outcome is to develop students' ability to participate effec-  
675 tively in today's highly mediated political spaces, then it is not enough simply to engage  
676 students in a technology-rich environment, or to teach them general structures and pro-  
677 cesses of politics. Rather, learning spaces need to direct students' cognitive and moti-  
678 vational resources toward specific knowledge-seeking behaviors that are aligned with  
679 being an informed and active citizen. Future research could be conducted to explore  
680 which types of design decisions can be employed with which types of students to  
681 direct their cognitive and motivational resources toward which types of epistemic  
682 achievements.

683

684 **Funding** This work was supported by a grant from the Spencer Foundation's New Civics Initiative  
685 (#201600081), which was awarded to Jeremy D. Stoddard (PI). All opinions, findings, conclusions, or rec-  
686 ommendations expressed here are those of the authors and do not necessarily reflect the views of the Spen-  
687 cer Foundation.

## 688 **Compliance with ethical standards**

689 **Conflict of interest** The authors declare that they have no conflicts of interest.

## 690 **APPENDIX A: SURVEY ITEMS**

### 691 **Pre-Intervention Survey and Post-Intervention Survey**

#### 692 **Self-Efficacy for Civic Engagement:**

693 Prompt: If you had to do the following tasks RIGHT NOW, how confident are you that  
694 you could do it? Scale of 1 = Not at all Confident to 6 = Completely Confident.

- 695 Participate in an INFORMED discussion of political issues
- 696 Construct good arguments about political issues
- 697 Begin a discussion regarding a controversial political issue with someone who disa-  
698 grees with me.
- 699 Identify hidden political messages in advertising
- 700 Identify hidden political messages in journalism
- 701 Persuade someone who disagrees with me to REACH CONSENSUS on a controver-  
702 sial issue
- 703 Do something to get local officials to address a problem
- 704 Use social media to effectively communicate about controversial political issues.
- 705 Evaluate the quality of different internet sources of political information
- 706 Take action to address a local policy or social issue



**707 Knowledge of Fracking (2 open-ended items):**

708 Prompt 1: What is the process of hydraulic fracturing or "fracking"? Please describe with  
709 as much detail as possible.

710 Scoring Guide:

711 1 = Fails to convey any specific understanding of the technologies used (e.g., horizontal  
712 drilling, high-pressure water, chemicals), to identify the specific product (natural gas) or  
713 the nature of the process (fracturing rocks to release the shale gas inside). Also makes inac-  
714 curate assertions.

715 2 = Conveys understanding that the purpose of fracking is to generate natural gas. Also  
716 gives vague/simplistic but broadly accurate descriptions of the basic process.

717 3 = Conveys a broad understanding of most of the products, processes, and technologies  
718 involved in fracking.

719 4 = Conveys a systematic understanding of the various products, processes, and tech-  
720 nologies involved in fracking, and how they play out sequentially.

721 Prompt 2: Why is the use of the fracking process considered a controversial public pol-  
722 icy issue in the US? Please be as specific as possible in your answer. Why do people disa-  
723 gree about whether or not we should use the fracking process?

724 Scoring Guide:

725 1 = Does not convey accurate knowledge of either the benefits or costs associated with  
726 fracking; does not indicate an understanding of how these benefits and costs conflict with  
727 each other (environmental protection vs. economic growth); does not give general or spe-  
728 cific examples of the benefits/costs associated with fracking; and makes vague or incorrect  
729 assertions that indicate confusion about specifics.

730 2 = Identifies the benefits of fracking, but not the costs, or vice-versa; and gives general  
731 (fracking raises environmental concerns) rather than specific (fracking leads to water pol-  
732 lution) but accurate examples of benefits and/or costs. OR gives a specific example of ben-  
733 efits but not costs, or vice-versa.

734 3 = Identifies both benefits and costs of fracking; and gives general examples of benefits  
735 and/or costs.

736 4 = Identifies both benefits and costs of fracking; gives specific examples of both costs  
737 and benefits.

**738 Epistemic Cognition (Epistemic Aims – two items):**

739 Analyze the source provided below and then answer the following questions.

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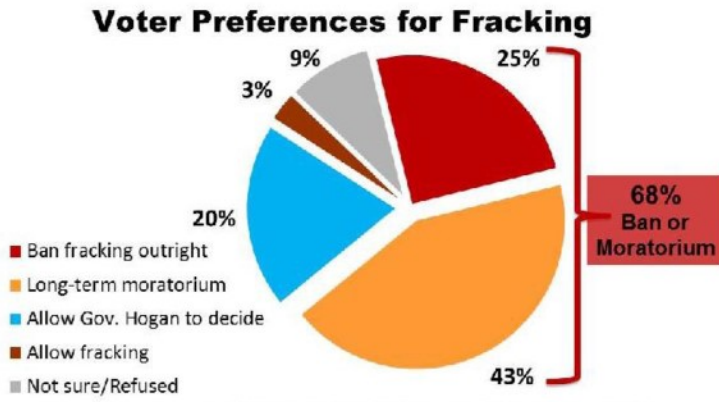
**To: Chesapeake Climate Action Network**  
**From: Steve Raabe, President  
 OpinionWorks, LLC**  
**Date: March 2, 2015**  
**Subject: Maryland Voter Poll on Fracking**

Chesapeake Climate Action Network commissioned this statewide Maryland voter poll to measure citizen attitudes about fracking in Maryland.

This telephone poll of 500 randomly-selected Maryland registered voters was conducted by telephone February 3-11, 2015, using trained and supervised live interviewers. The poll is balanced to reflect the geographic, political, and demographic makeup of the statewide electorate. The findings have a potential sampling error of no more than  $\pm 4.5$  percent at the 95% confidence level.

**Strong Voter Opposition to Allowing Fracking in Maryland**

Two-thirds of Maryland voters (68%) would either ban fracking outright in the state, or would place a long-term moratorium on fracking until studies show it could be done with little risk. Twenty-five percent would ban fracking, and 43% would impose a long-term moratorium.



"After more than six years of study, the New York State Health Department declared in December that "fracking" for natural gas posed too many human and environmental health risks to be done safely, so the governor banned the practice of fracking in the state. In Maryland, no fracking yet occurs, but studies have found that fracking here would pose similar risks. Knowing this, which of these options comes closest to what you think Maryland's legislature should do?" (Randomize options):  
 "Ban fracking in Maryland outright, as New York State did;  
 Place a long-term moratorium or hold on fracking until new studies show it can be done with little risk;  
 Allow Governor Hogan to decide whether fracking will occur in Maryland"

740  
 741 Ranking Prompt: If you came across this memo while you were on social media (e.g.,  
 742 Facebook), what would you be most likely to do next? Please drag and drop the items listed  
 743 below to rank them from top (MOST likely to do) to bottom (LEAST likely to do).  
 744 Forced Choice Ranking Options:

- 745 Look for more information about the polling agency  
746 Learn more about the topic of fracking  
747 Find out more information about the recipient of the memo  
748 Do nothing with it and move on to something else  
749 Re-Post the memo on social media  
750 Look for multiple polling results concerning this topic

- 751 Open-ended Prompt: For the top TWO (2) things that you listed in the previous ques-  
752 tion, please explain WHY you might be inclined to do those things.

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861 **Publisher’s Note** Springer Nature remains neutral with regard to jurisdictional claims in published maps and  
862 institutional affiliations.

863

864 **Jason A. Chen** is the Gerdelman Family Term Distinguished Associate Professor of Education at the Wil-  
865 liam & Mary School of Education. The questions that drive his research have to do with the various ways  
866 virtual learning environments can be designed such that students direct their motivation toward difficult  
867 tasks such as scientific inquiry or historical reasoning regarding controversial topics.

868 **Jeremy D. Stoddard** is professor in the Department of Curriculum and Instruction and Faculty Chair of  
869 Secondary Education at the University of Wisconsin – Madison. He teaches courses in social studies peda-  
870 gogical methods and graduate courses on the intersection of media education and democratic education.  
871 His research focuses on how young people learn about politics and controversial or difficult historical and  
872 contemporary events and issues through engaging with media.