DIVING INTO THE REALM OF STEM AND POLITICS

by

Jackson Bostic, Emma Gebel, Andrea Knight, Emma Grace Primm, Braddock Rhodenhiser

A Senior Honors Project Presented to the

Honors College

East Carolina University

In Partial Fulfillment of the

Requirements for

Graduation with Honors

by

Jackson Bostic, Emma Gebel, Andrea Knight, Emma Grace Primm, Braddock Rhodenhiser

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Approved by:

Tim Christensen

Biology, Thomas Harriot School of Arts and Sciences

Abstract

According to the 2018, National Study of Learning, Voting, and Engagement (NSLVE) report, Science, Technology, Education, and Mathematics (STEM) majors do not vote at high rates compared to non-STEM majors at East Carolina University and around the country. We believe this is a pressing issue that should be addressed. Going back to the fundamentals of education, we created the first ever East Carolina University Honors College Seminar developed by students, for students, to address the lack of voting among STEM majors. The seminar is currently being taught this semester (Spring 2023) by Dr. Mosier, a professor in the Political Science Department. The course emphasizes the importance of scientifically sound civic engagement and political participation for STEM majors and other STEM interested students.

As a result of new research, we are shifting our efforts to the East Carolina University student body, but still with a focus on STEM-related topics. By the Fall of 2023, we plan to have this topic implemented into the COAD 1000-Student Development and Learning in Higher Education course.

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Team Roles

At the beginning of our project, we designated team roles. Our team consists of five members: Jackson Bostic (Facilitator), Emma Gebel (Devil's Advocate), Andrea Knight (Arbitrator), Emma Grace Primm (Communicator), and Braddock Rhodenhiser (Secretary).

Introduction

Honors 2000

As Honors College first-year students, it is a requirement to take the Honors Leadership and Service Colloquium course that focuses on leadership theory and model for engaged public service. During this course we were placed into groups based on our specific interests. In this course, we were placed into groups based on our specific interests with the purpose of solving a "Wicked problem." A wicked problem is a social or cultural issue that is challenging or impossible to solve. We ideated many viable solutions and ultimately had to pivot from each idea. Our original ideas included a mayoral debate using the candidates of Greenville, North Carolina, and other political events such as polling and registering students as voters. Through these ideas, we connected with Alex Dennis, the senior assistant director at the Center of Leadership and Civic Engagement at East Carolina University. This led to the discovery of the NSLVE report where we learned that STEM students were voting at much lower rates than other majors such as education, history, and liberal arts (Trinh et. al., 2021). Our group believed this was a pressing issue that needed to be addressed.

Interviews were emphasized by the faculty to further grow our knowledge and connections. Our most impactful relationships created were with the Executive Director of the

National Center of Science and Civic Engagement, Eliza Reilly and the Director of the National Study of Learning, Voting, and Engagement, Nancy Thomas.

Through interviews, we decided to use the resources at hand to ideate our next solution. As required for the Honors College, each member must take a set number of seminars. Therefore, we produced the idea to create an Honors Seminar designed by students, for students to combat low voter turnout among STEM majors.

Honors 3000

In our second semester, the Honors Research Colloquium, we continued the idea of creating an Honors seminar to address the discrepancies between STEM and politics. The mission model canvas, which is shown above, allowed us to ideate to our peers and professors about how our idea can be impactful. The mission model canvas is an adaptation of the business model which measures success by mission achievement rather than earning money. Each week we focused on a main part of the mission model canvas such as mission achievement/impact factors, key partnerships, buy in and support, and key resources. The mission model canvas allowed us to see what we accomplished each week. Through using the mission model our idea of creating a seminar came to fruition by identifying what goals we needed to fulfill.

We developed the idea of creating a seminar based on the NSLVE data that showed STEM majors do not vote at higher rates compared to non-STEM majors. For example, according to the NSLVE Report 19% of computer science majors at ECU voted, opposed to 43% of education majors voting (Trinh et. al., 2021). Not only is this a problem at East Carolina University, but it is also a recurring theme throughout the country. We contacted Dr. Alethia

Cook, the Political Science Department chair, and she recommended Dr. Samantha Mosier to teach the course.

Dr. Mosier agreed to teach the course and created a syllabus and course schedule (Appendix B). The goal of the seminar was to educate STEM students in the East Carolina University Honors College on how politics affect their daily lives. We wanted to provide a way for STEM students to become more civically engaged citizens and to become politically empowered through an unbiased, open discussion environment, in hopes to spark an interest in politics, and raise the voter turnout.

The focus of Honors 3000 was human-centered design. Human centered design contains different phases such as empathize, define, ideate, prototype, test, iteration, and implementation. Each phase promotes a better understanding and development of our proposed solutions. Prototyping, testing, and iterating our solution was the best way for us to see the impact our solution had on others. During this process we received feedback from our peers and professors. This feedback led us to our final solution of creating a seminar and making a more well-developed idea. Our final poster presentation in Harvey Hall was about our progress in creating the honors seminar and trying to promote the course to our peers. In honors 3000, we decided to incentivize our seminar by planning a trip to Washington, D.C. in hopes to create more interest in the course, but the trip was not approved, leading to a lower turnout than expected.

Events and Efforts

Seminar

We decided to go back to the fundamentals of education to address this issue. This spring semester (Spring 2023), Dr. Samantha Mosier is teaching STEM and Politics, an

interdisciplinary Honors College Seminar. We worked in collaboration with Dr. Mosier to design the seminar. The purpose of the course is to examine how modern politics is shaped by environmental and technological issues such as climate change, public health, infrastructure, agriculture production, and food science.

Science and technology play an integral part in the functioning of modern societies and lead to a world in which we are healthier, wealthier, and more connected. However, as the dependency on technology and scientific advancements increases so does the political conflict surrounding how it is used and governed.

The goal of this seminar is to prepare East Carolina University undergraduate students to enter the world civically engaged, and ready to tackle the political challenge of increasing the low voter turnout rate among STEM majors. This will be done by making a connection, hoping to create scientifically engaged citizens by explaining science to them in a step-by-step approach to scientific thinking.

To gauge interest in our seminar, we conducted a survey to see how many honors students would potentially take our course. A survey was created to obtain data on ECU Honors College students to see if they would be interested in taking the seminar. The data from this survey showed that 58.9% of students would be interested in taking the course (see Appendix A for survey questions). However, only 3 people are taking the seminar, which does not have a significant impact. (Group 85: Student Politics) This created a problem since the average seminar size ranges from 10 to 15. Our hope was to have the seminar taught to more honors students as a pilot course. Originally, we planned to conduct research on those taking the seminar but due to the low participation, this was not feasible. We explored ways to conduct research on our seminar. These included quantitative and qualitative research, pre- and post-assessments, and

case studies but the research would not have been measurable due to the class size. Thus, leading to us pivoting our idea into creating COAD course materials.

COAD

After a setback with our Honors Seminar, we decided to look for other ways we could present this material. Through our brainstorming process, we decided we wanted to create something that could be continued even after we graduated. We met with student transitions here at ECU and presented a few of our ideas. Introducing our issue of political engagement through a module in the COAD 1000 class was the idea we agreed would reach the most students, therefore having the greatest chance for impact. Most of these students are just getting to the legal voting age and are in a critical period of political understanding. They are stepping out into the real world, where they can form their own opinions.

Since our material would be presented to a large group of students of all different majors, accompanied by new research showing that STEM major voting rates rose from previous elections, we decided we would aim our efforts towards the general student population, while maintaining a focus on STEM policies.

Our COAD unit is composed of resources we created ourselves and of resources we found through research. The beginning activity is a resource called ActiVote. ActiVote is a one stop shop application that includes a political matrix, information on political candidates voting history, upcoming election details, and a complete list of your elected officials if you include your voter information. There are two main strengths of the ActiVote political matrix. The first being that, since you must create an account, you can answer questions at your own pace and your matrix will fluctuate as you answer. The second being that there are specific bills and issues

where you can learn more, then provide your answer once you are more educated (Allis et al., 2023). Due to COAD being a class, we have included activities and discussions that students could complete as assignments.

Another resource we have included is a PowerPoint that we have created. The PowerPoint highlights the importance of political engagement, resources, and ways to get engaged (Appendix C). Since our main purpose is to get students excited and engaged, we have included a group activity where students pick a topic and create a policy, they think would benefit a group or object. Additionally, we have created several infographics like the one above, on resources or ways to get engaged.

Personal Reflection

Our Signature Honors Project provided an excellent opportunity for me to grow as a leader. Through the project, we connected with individuals in highly ranked positions within their respective organizations, learned how to cope with failure and pivot, and worked in a long-term team.

Whether presenting in front of 300 of our peers or communicating with experts in various, this project pushed each group member outside of our comfort zone. I struggle to reach out to people who hold high positions. I am fine once I make a connection, but making the initial contact is hard for me. I worry about their response, but through this project, I learned that the worst they can do is say they do not want to help you. As a result of the project, I communicate regularly with an executive director of a national organization. I never would have envisioned this before our project.

From our very first pitch to the last few weeks of our project, we heard the word "no" many times. After our first pitch, we thought we had failed and needed to change course completely. We did not put our all into the idea or the presentation. As the weeks passed, we slowly got better feedback as we altered our solution. This process taught us a valuable lesson: you get what you put in. After the end of Honors 3000, we had a feasible solution, even with all the "no's" we had received throughout the semester. Learning that "no" is not always bad changed our project's course. We started taking our feedback constructively and pivoted accordingly.

In conclusion, our Signature Honors Project helped me grow academically, professionally, and personally. I learned never to accept "no" for an answer, not to be afraid to pivot, and never to be scared to reach out to experts in the field. I became truly inspired by our work and am excited to monitor the trends in STEM voting tendencies in future elections.

Conclusion

Now is the time for science, not silence. We, Group 85, believe that we are at a crossroads in our nation's history. Now, more than ever, we are seeing scientifically driven elections, and we need our citizens to be better informed. Even though this is just a drop in the ocean of overarching turnout rate issues, we hope this is something East Carolina University will find beneficial and will implement in their COAD 1000 classes. We are currently working with the student transitions office to edit our material so it can be presented at the COAD training sessions this year. To conclude, our group understands that not everyone has an interest in politics, but if this material can reach just a few students from each class, we can work to increase the voting rate of 72.6% campus wide.

Bibliography

Allis, V., Gifford, S., & Raué, P.-E. (2023). Activote. https://www.activote.net/

Martin, K. (2022). *ECU honors college students increasing Civic Engagement*. (n.d.). Retrieved April 17, 2023, from https://news.ecu.edu/2022/12/05/ecu-honors-college-students-increasing-civic-engagement/

Trinh , D., Gautam, P., López, N., Thomas, N., Brinker, D., & Gismondi , A. (2021). *Student Voting Rates for East Carolina University 2020 NSLVE Campus Report*. NSLVE Report. https://allinchallenge.org/wp-content/uploads/Western-Carolina-University-NSLVE-Report-2020-002981.pdf

Appendices:

Appendix A

Group 85: Student Politics Survey

1. What is your name?

2. What is your ECU email?

3. Are you a member of the East Carolina University Honors College?

4. What year are you?

5. Are you a STEM major? (Science, Technology, Engineering, Mathematics)

6. If yes, what is your major?

7. Would you be interested in an honors seminar focused on science and politics

Appendix B

HNRS 2116: STEM and Politics
Spring 2023
Brewster 000
Tuesdays (0:00 – 0:00pm)

Instructor: Dr. Samantha Mosier
E-mail: mosiers18@ecu.edu
Office #: 252-737-5575
Office: Brewster A-135
Office Hours: Wednesday (0:00-0:00pm) or by Appointment (24 Hour Notice and Confirmation Required)

Course Description & Objectives

This course is design to examine how modern politics shapes and is shaped by environmental and technological issues (e.g., climate change, vaccinations, industrial agriculture). Science and technology play an integral part in the functioning of modern societies and led to a world in which we are generally healthier, wealthier, and more connected. However, as the dependency on technology and scientific advancements increase, so too has the political strife surrounding how it is used and governed. In essence, science and technology are political, and this has led to challenges for scientists (and current STEM majors) in understanding how their work is interdependent with political decision-making processes and navigating their role in the political process. This course emphasizes preparation for STEM majors and STEM-interested students in the importance of scientifically-sound civic engagement and political participation.

HNRS 0000 Course Student Learning Outcomes:

Students are expected to master the following *Course Specific and Writing Intensive* student learning outcomes: (Course Specific Competency = "CSC," and Writing Intensive Competency = "WIC"). Students who have successfully completed this course are able to:

1. Explain the role of STEM and scientists in politics and the policymaking process. (CSC 1)
2. Specify the causes of misinformation and skepticism of science. (CSC 2)
3. Evaluate the causal reasons for declining infrastructure quality in the U.S. (CSC 3)
4. Assess the mechanisms and impacts of vaccine hesitancy for modern society. (CSC 4)
5. Evaluate the politization of science in the climate change policy domain. (CSC 5)

1. Critique the rise of industrialized agriculture as a predominant food production system. (CSC 6)
2. Diagnose the challenges associated with the use and interpretation of food labels. (CSC 6)
3. Debate the implications of a politicized dietary guideline. (CSC 7)
4. Create an assessment and presentation of a policy issue domain where STEM-politics interaction is concerning. (CSC 8)
5. Write in an academic, professional, and formalized tone. (WIC 1)
6. Develop the ability to vary in writing style. (WIC 2)
7. Critique the writing of others in a constructive and professional manner. (WIC 3)
8. Produce a reflection journal that demonstrates procedural and megacognitive knowledge of various science and technology policy issues.(WIC 4)
9. Synthesize overarching themes and challenges of STEM in politics through a semester reflection paper. (WIC 5)

Course Materials

There are three required books for this course. Those books include the following:

- Nestle, Marion. *Food politics*. University of California Press, 2013.
- Pielke Jr, Roger A. *The honest broker: making sense of science in policy and politics*. Cambridge University Press, 2007.
- Sagan, Carl. *The demon-haunted world: Science as a candle in the dark*. Ballantine books, 2011.

All other required assigned readings (including those selected for Discovery Weeks) for the course will be available on Canvas.

There are two recommended readings for the course that should be completed before the third week of the semester. Please complete the optional recommended readings should you want to refresh or further familiarize yourself with the policy process and regulatory policy. Optional readings for the course include the following:

- Birkland, Thomas A. *An introduction to the policy process: Theories, concepts, and models of public policy making*. Routledge, 2015.
- Dudley, Susan E., and Jerry Brito. *Regulation: A primer*. The Mercatus Center at George Mason University, 2012.

Course Requirements & Grading

The final grade in the course is determine by three sets of activities including a reflection journal (55%), a semester synthesis paper (15%), peer feedback (15%), and group discovery week (20%).

Reflection Journal: [TOTAL 55%]

- There are 11 total journal reflections that are to be completed throughout the course. Each journal reflection requires you to respond to various questions, utilize various writing styles, and demonstrate a mastery-level understanding of the subject content covered for that week(s). Each journal entry is worth 5% of the final grade.

Semester Synthesis Paper: [TOTAL 15%]

- Each student in the course will develop a semester synthesis paper that will demonstrate their understanding and position of core themes of the course and the role of STEM in politics. A draft of the paper is due two weeks before the end of the semester with a final grade deduction if not submitted on time.

Peer Feedback: [TOTAL 15%]

- Students are expected to provide constructive feedback to assigned peers for reflection journal entries and the draft semester synthesis submission. Feedback should meet assigned deadlines as designated in Canvas.

Group Discovery Week: [TOTAL 20%]

- Students will be divided into three groups with each group responsible for the identification of a STEM issue to be discussed in class. Each group will research the subject and direct class activities and discussion on the topic during one of the last three weeks of class. The grade will be determined based on the quality of class activities developed, the presentation of class activities, and individual-level contribution to group work. Failure to be a productive group member will result in a lower grade.

As an FYI about coursework and graded assignments…

- Students are expected to attend all scheduled sessions. Each student is expected to read any assigned readings, engage in class discussions, and critically assess the materials read and developed in the course. Active class discussions of readings and comments on the work of classmates are *expected*.
- *Late submissions will be penalized by 20 points for each day late or delayed. After five days, a grade of '0' will be assigned.*
- *Extra credit and second attempts are not offered in this course. Please prepare for the class activities and demands at the beginning of the semester.*
- *Grades are not assigned on the amount of time or effort put forth on the assignment. Grades are determined by the quality of the work submitted. While more time and effort put forth towards a project usually leads to a higher grade, this is not universally true and, therefore, your assignment grades are based on quality. You should know how much time and effort you need to put forth in this class to submit quality work.*
- *An automatic zero will be applied to an assignment and/or to the course grade if any part contains any shape, size, or form of academic misconduct. See the Academic Integrity section for more information about what constitutes academic misconduct activities.*

Grading System

Grade	*Grade Scale*	*Quality Points*	*Grade*	*Grade Scale*	*Quality Points*
A	93-100	4.0	C	73-76.99	2.0
A-	90-92.99	3.7	C-	70-72.99	1.7
B+	87-89.99	3.3	D+	67-69.99	1.3
B	83-86.99	3.0	D	63-66.99	1.0
B-	80-82.99	2.7	D-	60-62.99	0.7
C+	77-79.99	2.3	F	0-59.99	0

Academic Integrity

The university code of academic integrity will be strictly enforced in this course. According to the East Carolina University Honor Code, violations of academic integrity include the following:

- *Cheating.* Unauthorized aid or assistance or the giving or receiving of unfair advantage on any form of academic work.
- *Plagiarism.* Intentionally or unintentionally copying the language, structure, ideas, and/or thoughts of another and adopting same as one's own original work.
- *Falsification.* Statement of any untruth, either spoken or written, regarding any circumstances relative to academic work.
- *Attempts.* Attempting any act that if completed would constitute an academic integrity violation as defined herein.

For more information about university policies concerning academic integrity, please visit the web at https://osrr.ecu.edu/faculty-staff/

Special Assistance

East Carolina University seeks to comply with the Americans with Disabilities Act (ADA) Students requesting accommodations based on a covered disability much go to the Department for Disability Support Services located in Slay 138 to verify the disability before any accommodations can occur. The telephone number is 252-737-1016.

E-mailing Your Professor & Checking Your Email

Communication is an important component to any course. The two easiest methods of communication are via email or by phone. For email, I will usually be able to answer your emails within 24 hours except on weekends, holidays, or times I am away from work for personal and business-related reasons. I typically will not respond to emails between 6:00pm – 8:00am. Email is the easiest way to receive a prompt reply.
My expectations of you, the student, is to check your university email frequently and respond to emails within a reasonable timespan depending on the nature of the email. For example, if you are trying to set up a meeting appointment, please confirm 24 hours prior to the meeting of your attendance.

Emergency Notices & Continuity of Course

It is possible that during the course of the semester that emergencies will occur and disrupt regularly scheduled classes. Emergency notices are posted at http://www.ecu.edu/alert and available through the campus emergency information hotline at (252)328-0062. If and when face-to-face classes are suspended, you should know that online classes are “cancelled” for that day as well and you will receive an announcement for how the class will continue. Please note that during periods when classes are cancelled, your professors are considered non-essential personnel and are not/should not be expected to be working.

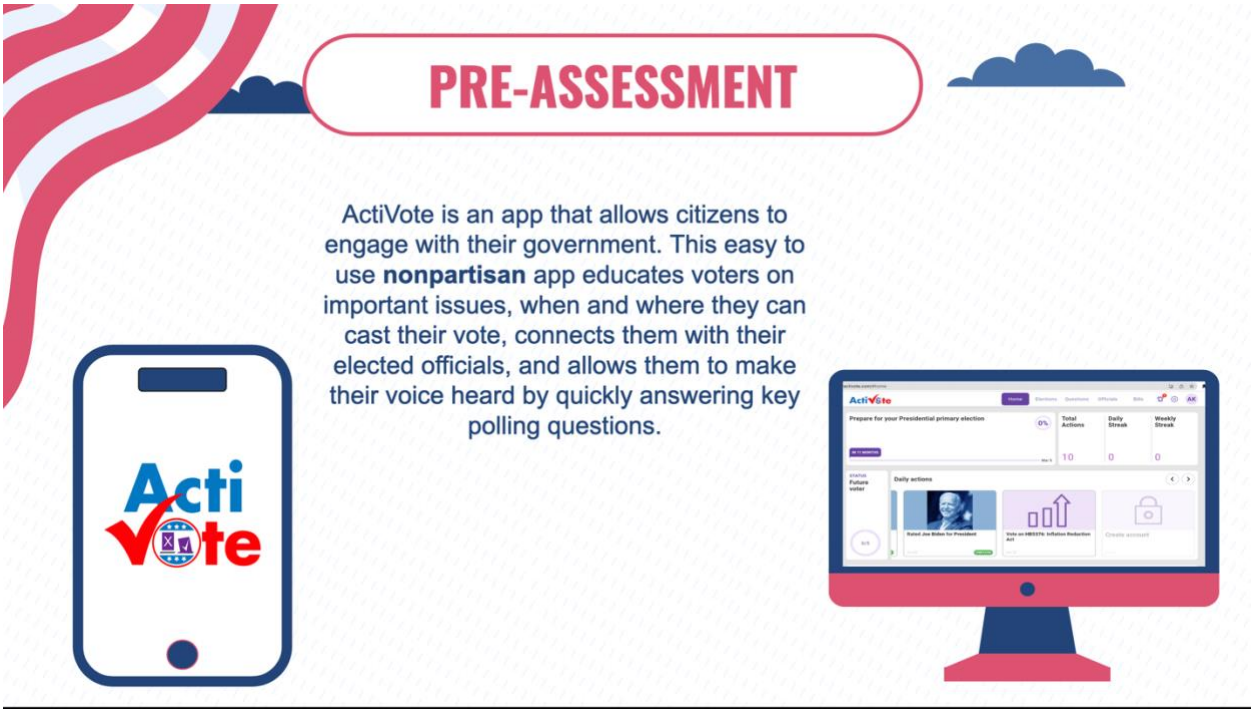
Class Schedule

The weekly schedule below (listed corresponding Monday) is based on the assumption that we will not have significant disruptions due to extreme weather, the continuing pandemic, or other random and unpredictable events. Adjustments will be made as necessary with the modified scheduled announced via Canvas.

DATE	ACTIVITY	WHAT'S DUE?
JAN 9	The Role of STEM in Politics *Read: Demon Haunted World*	Journal Reflection #1
JAN 16	The Role of STEM in Politics *Read: The Honest Broker*	Journal Reflection #2
JAN 23	Infrastructure as an Achilles Heel *Read: TBD*	
JAN 30	Infrastructure as an Achilles Heel	Journal Reflection #3
FEB 6	Public Health and Anti-Vaxxing *Read: TBD*	
FEB 13	Public Health and Anti-Vaxxing	Journal Reflection #4
FEB 20	The Science and Politics of Climate Change *Read: TBD*	
FEB 27	The Science and Politics of Climate Change	Journal Reflection #5
MAR 6	No Class - Spring Break	
MAR 20	The Problem with Agricultural Production *Read: TBD*	Journal Reflection #6
MAR 27	Mistrust and Misunderstanding of Food Labels *Read: TBD*	Journal Reflection #7 Proposed Discover Group Topic
APR 3	The Politics of Eating *Read: Food Politics*	Journal Reflection #8
APR 10	Policy Discovery Week – Group #1 *Read: TBD by Group*	Journal Reflection #9
APR 17	Policy Discover Week – Group #2 *Read: TBD by Group*	Journal Reflection #10 Draft Semester Synthesis Paper
APR 24	Policy Discovery Week – Group #3 *Read: TBD by Group*	Journal Reflection #11
FINALS WEEK	--	Final Semester Synthesis Paper

Appendix C


HOW TO INCREASE
POLITICAL ENGAGEMENT
Among East Carolina University Students


PRE-ASSESSMENT
ActiVote is an app that allows citizens to engage with their government. This easy to use **nonpartisan** app educates voters on important issues, when and where they can cast their vote, connects them with their elected officials, and allows them to make their voice heard by quickly answering key polling questions.
Acti
Vote

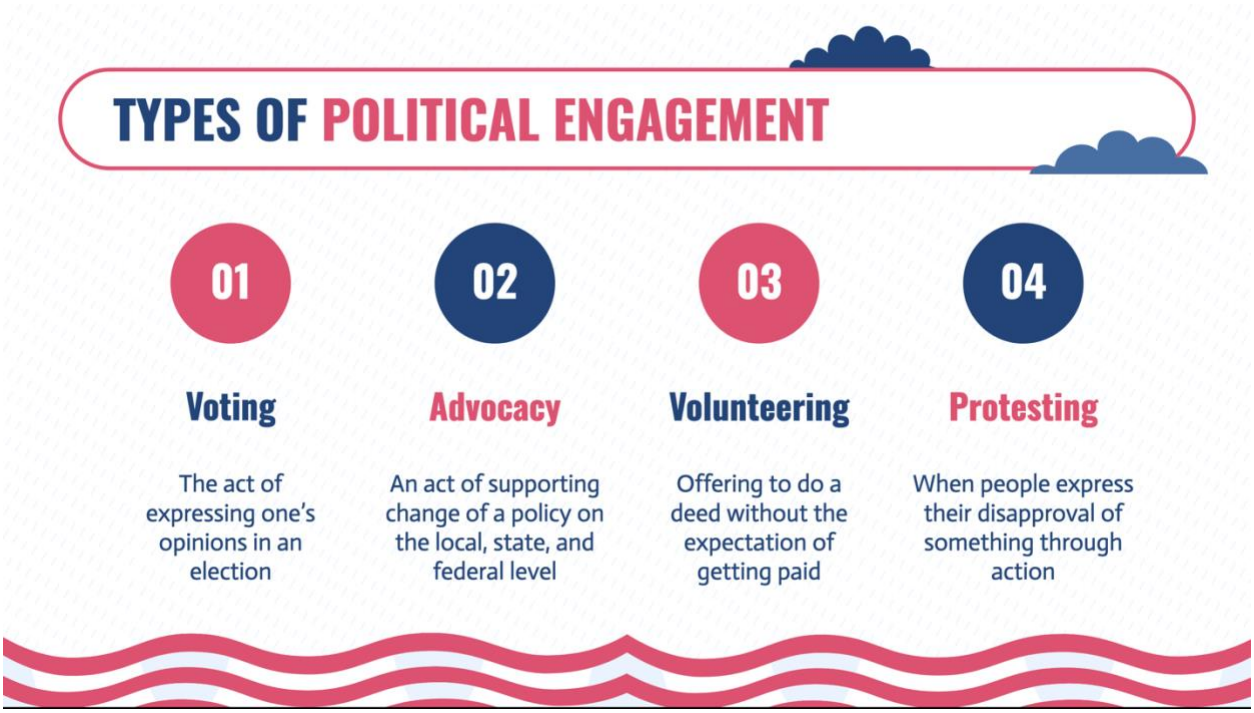
ActiVote Discussion

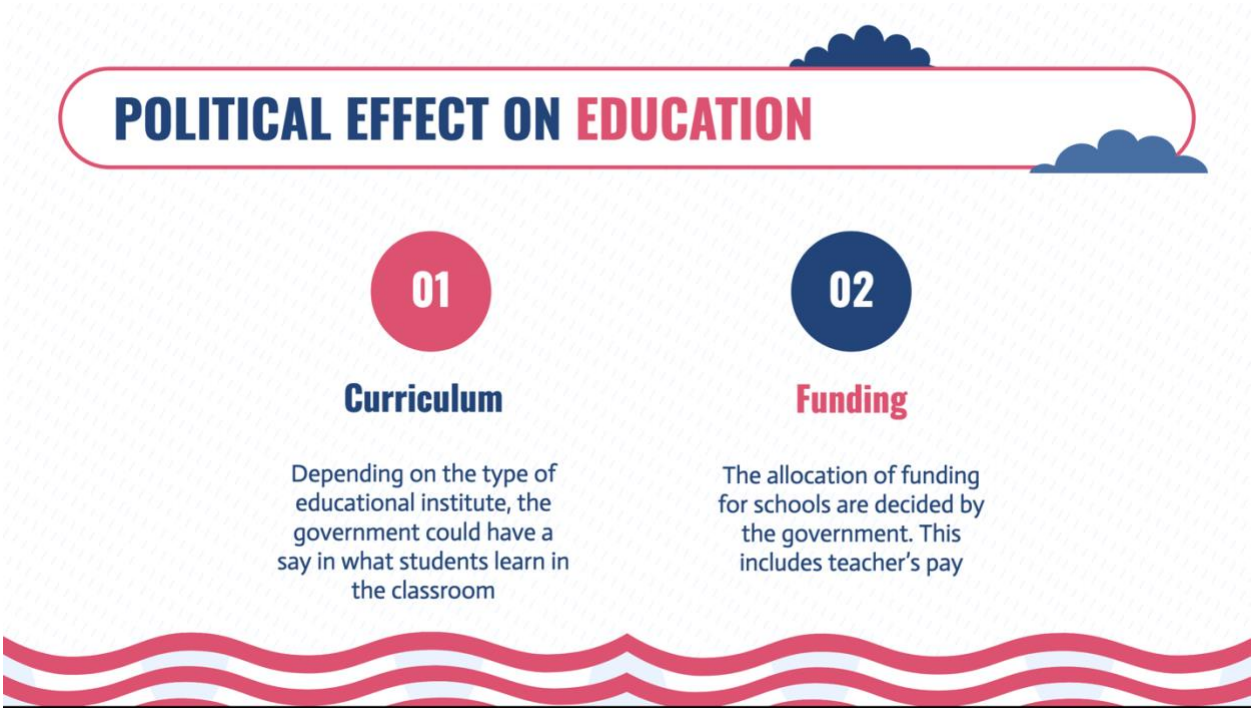
POLITICAL ENGAGEMENT

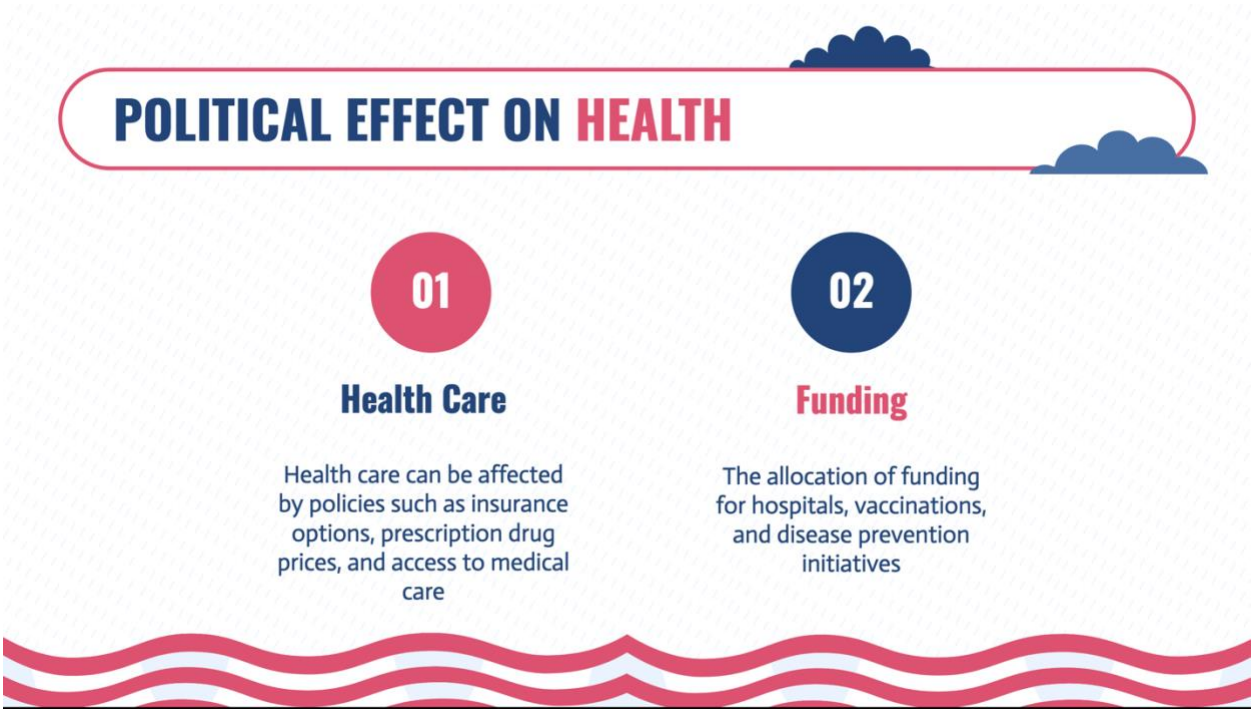
Political engagement can be described as participating in activities that can influence the way that the world is governed.

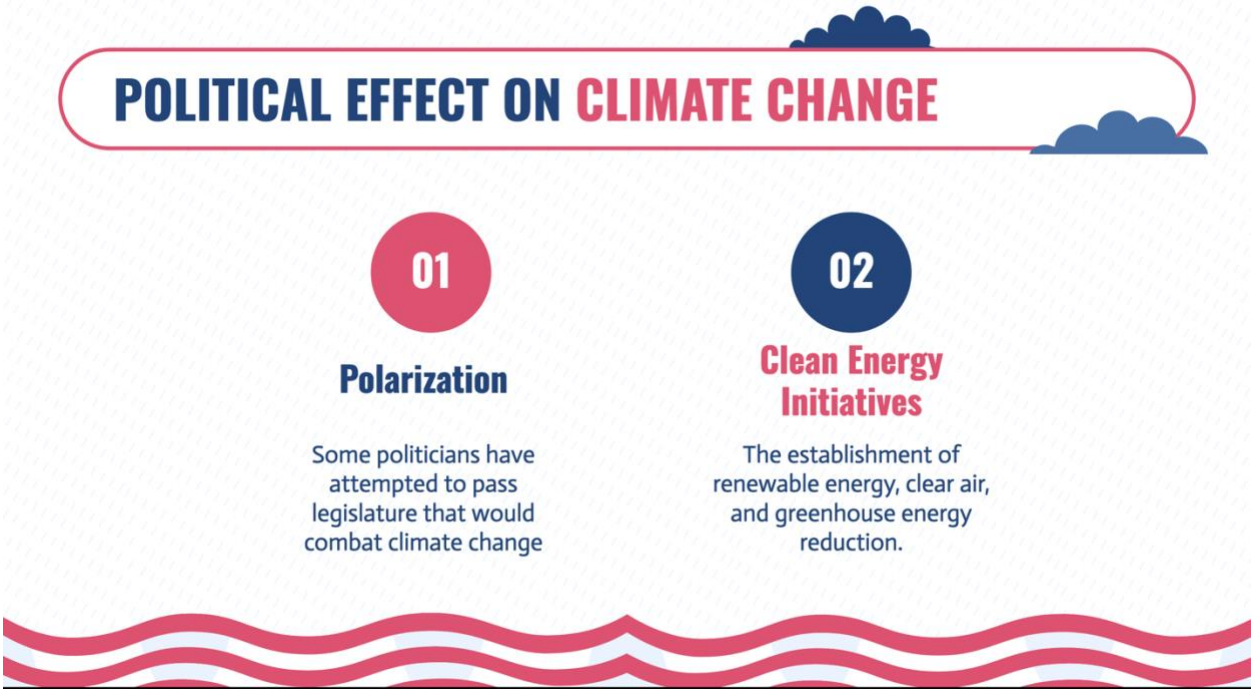
WHY IS POLITICAL ENGAGEMENT IMPORTANT?

Educating college students about the importance of political engagement is crucial because the political system could impact the fields that students choose to pursue a career in. Political empowerment can lead to increased voting rates and confidence in the understanding of government systems.


TYPES OF POLITICAL ENGAGEMENT
01
Voting
The act of expressing one's opinions in an election
02
Advocacy
An act of supporting change of a policy on the local, state, and federal level
03
Volunteering
Offering to do a deed without the expectation of getting paid
04
Protesting
When people express their disapproval of something through action


POLITICAL EFFECT ON EDUCATION
01
Curriculum
Depending on the type of educational institute, the government could have a say in what students learn in the classroom
02
Funding
The allocation of funding for schools are decided by the government. This includes teacher's pay


POLITICAL EFFECT ON HEALTH
01
Health Care
Health care can be affected by policies such as insurance options, prescription drug prices, and access to medical care
02
Funding
The allocation of funding for hospitals, vaccinations, and disease prevention initiatives


POLITICAL EFFECT ON CLIMATE CHANGE
01
Polarization
Some politicians have attempted to pass legislature that would combat climate change
02
Clean Energy Initiatives
The establishment of renewable energy, clear air, and greenhouse energy reduction.

WHAT CAN YOU DO?

You have the power to make a change by getting involved in political engagement:

Actions

- Register to vote
- Volunteer at local polling stations
- Contributions to the community
- Contact your local politician
- Follow political news