

Using OERs to Close Inequity Gaps in Political Science

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Abstract

Beginning in July 2021, Political Science instructors at Pellissippi State Community College began the process of transitioning from commercially published textbooks to Open Educational Resources (OERs) in its introductory courses. The project is part of a statewide initiative led by the Tennessee Board of Regents (TBR) to increase equity in access to quality, no/low-cost educational materials. The overarching goal is to increase success rates and improve educational outcomes for traditionally underserved students, such as but not limited to students of color, first-generation college students, and economically disadvantaged students. Pellissippi State has traditionally been the largest community college in the state of Tennessee and its enrollment population is made of both traditional and non-traditional students from every race and socio-economic income level. However, data collected prior to this transition has revealed lower completion and retention rates among minorities. A research team at Pellissippi State Community College was awarded two separate grants by TBR to conduct these transitions. This presentation will consist of two parts. The first part summarizes the process of transitioning the Introduction to American Government course to an OER textbook created by OpenStax, along with adopting and creating additional open access materials during the 2021-2022 academic year. Both qualitative and quantitative data were collected and analyzed from a total of 14 sections of the course to determine the impact of the transition. The second part will chronicle ongoing efforts of an inter-departmental team – consisting of faculty from Political Science, Media Technologies and Web Design, and Librarian Services – to create an Open Access Publication for the Introduction to Political Science course. Although this project will be in process during the conference, a summary of the work to date will be provided.

1. Introduction

The pursuit of a postsecondary education is becoming more common and affordable among many disadvantaged people groups in America, including low-income families, minorities, and those with special needs. However, opportunity does not always mean affordable [1]. The integration of Open Educational Resources (OER) into the higher education classroom has been on the rise throughout much of the 21st century, primarily as a way to help minimize the costs associated with taking college-level courses. This paper provides an overview of a project conducted by Political Science and Library Services faculty at Pellissippi State Community College to integrate an OER textbook provided by OpenStax into the college's American Government course, as well as its ongoing efforts to create an OER for the Introduction to Political Science course. This paper will begin with a brief summary of the extant literature on the costs and benefits of using OERs, including additional resources in addition to free textbooks, followed by an explanation of the task and purpose of the OER integration project at the college. It will also provide some preliminary findings and conclusions on the performance of American Government students prior to and after implementation of the OER. Finally, it will introduce the current project of creating an OER for the Introduction to Political Science course at the college. The goal of this paper is

to present data that can help shed light on the impact that OERs can have on student success rates in political science courses.

1.1. The Rise of OERs

To overcome the challenge of rising costs associated with higher education degrees, institutions, departments, disciplines, and individual faculty members have transitioned to using open educational resources. The rationale behind these efforts suggests that minimizing additional costs beyond tuition and fees could increase success rates in the classroom, as well as retention rates at institutions. There is little doubt that the “nickel and diming” of students seeking postsecondary education serves as a deterrent to continuing one's schooling and OERs are seen as a viable alternative to overburdening students with additional expenses. Recent studies have even found that individuals with food and/or housing insecurities may have to choose between a textbook and paying for rent or buying groceries [2]. OERs, according to Tuomi are “sources of services” that are nondiscriminatory in terms of access to information and knowledge about the resource [3]. Secondly, these services can be enjoyed by anyone with sufficient nondiscriminatory capabilities (p. 34). While much of the extant literature on OERs focuses on the creation, funding, licensing, implementation, and the different forms they can take (e.g., textbooks, websites, articles, assignments, etc.) universal

accessibility is the common denominator. This overarching principle suggests that valuable educational information can and should be available to both educators and learners.

As OERs gained a foothold in the higher education environment, questions about the quality of open resources surfaced. Many were concerned that open access information was likely not peer-reviewed and lacked the accountability measures inherent in the scholarly work currently in use. What is more, many of these resources might be hard for both educators and students to find and those that were readily available might not be sustainable over time. This argument asserted that investing money in products offered for free were basically sunk costs. It is also worth noting that many of these concerns and criticisms occurred during the earlier part of the 21st century, when accessibility to digital products was much lower. With the rise in technology and rapid expansion of access to the internet, the arguments against OERs began to dissipate. Problems with quality and the need to modify or revise material before implementation were still present, but manageable with the proper technical support and training, especially when institutions are willing to invest in the transition. In short, the benefits have started to outweigh the costs in many (not all) educational disciplines and institutions. As Hylen and D'Antoni both found, public institutions with a mission focused on public outreach have taken the initiative to invest in these types of projects [4, 5]. Even more, Caudill found that creation and integration of OERs into existing curriculum has become quicker and easier [6].

The willingness of governments, colleges and universities, and educators to invest in the process of creating and utilizing OERs, along with the technologies needed to integrate them into courses and programs, has uncovered a number of opportunities to alter the current method of instruction in higher education. Yuan, McNeill, and Kraan identified several short and long-term initiatives undertaken by a myriad of different organizations in the China, France, Japan, the United Kingdom, and the United States [7]. One American institution they pointed to be an initiative funded by Rice University, which sought to interweave content, software, and learning communities by creating a series of free online scholarly materials that could be housed in a single location and accessible to the public. Since the authors' publication, this project, originally called Connexions, has evolved into what is known today as OpenStax. Created in 2012, OpenStax currently has published over 40 textbooks for college and high school level education and roughly 70 percent of higher education institutions in United States use one of more of their resources. Rice University established OpenStax as a 501(c)(3) nonprofit charitable corporation and this allows them to receive funding from philanthropic foundations to support and sustain their operations. They also partner with many of the leading educational resource companies to provide low-cost products for educators and students. All materials created and maintained by OpenStax are peer-reviewed and accessible to anyone, anywhere, at any time.¹ OpenStax created and houses the textbook that was adopted for the project this paper is based on.

1.2. OERs As a Tool for Educational Equity

While the use of OERs has increased significantly over the last decade, empirical observations have been lagging behind somewhat. This is to be expected since implementation of OERs must precede analyses; however, a case study performed by Nusbaum, Cuttler, and Swindell provided some valuable insight into many of the issues surrounding open textbooks [8]. More specifically, they found that many of the disadvantaged groups in their study benefited from the use of an open textbook, both academically and financially. The authors separated 11 sections of an Introductory Psychology course at Washington State University into two groups, with one using a traditional commercial textbook and the other using an open textbook. Students were evenly divided into two groups, to account for gender, ethnicity, student loan debt, employment status, and family educational history. Students were also asked about their behavioral patterns when faced with high textbook costs. For instance, their results found that ethnic minorities and first-generation students were prone to drop a course if the textbook was too costly compared to their peers. These findings support the argument that even though higher education is becoming more available, it is not financially equitable.

Another important finding of this study regards the performance of students in each group. Nusbaum et al. found no significant difference between the performance of students in either group [8]. What is more, students did not disclose any negative perceptions of the open textbook. These findings are important because they undercut some of the criticisms that open textbooks lack the same quality as commercial textbooks, or that students are likely to perceive them as less valuable. Taken together, this case study suggests that free textbooks can provide the same amount of educational value as those with a price tag, especially among the demographics that have not had proper access to postsecondary educational opportunities. This study also provides some comparable data for the current project, as both disciplines fall within the realm of the social sciences.

2. An American Government OER Case Study

During his tenure as Governor of Tennessee, Bill Haslam initiated the "Drive to 55" program, which seeks to equip 55 percent of Tennesseans with a college degree or certificate by 2025. Three key financial incentives associated with this program are the Tennessee Hope, Tennessee Promise, and Tennessee Reconnect scholarships. The first program provides high schools graduates in Tennessee with financial assistance to a four-year institution, pending they meet a series of requirements. The second provides free in-state tuition to any community college in the state, while the Tennessee Reconnect scholarship allows any adult over the age of 23 to attend college. By lowering the financial burden associated with postsecondary education, the state has seen a significant increase in the number of students attending college, especially minorities, low-income families, and first-generation college students.¹ However, even these types of educational scholarships have not eliminated all the costs for students. In many cases, students are still required to purchase textbooks for specific courses, and this has proved to be a hindrance or even a

¹For more information on the Drive to 55, as well as the various educational scholarships offered to TN students, you can visit the TN Higher Education Commission's website at <https://www.tn.gov/collegepays/financial-aid.html>

deterrent to continuing their education. To address this issue, the Tennessee Board of Regents (TBR), the governing body for the 13 community colleges and 24 colleges of applied technology in the state, has invested money in trying to reduce or eliminate the costs of textbooks within their institutions. The purpose of the project is to increase equity in access to quality, no/low-cost educational materials, with the goal of increasing success rates and improving educational outcomes for undeserved students. These groups consist mainly of students of color, first-generation college students, and economically disadvantaged students.

The program adopted the 5 R's of OER – retain, reuse, revise, remix, and redistribute – created by Wiley to create, integrate, and house material for courses offered at each of the 13 community colleges throughout the state [9].² Faculty at any TBR institution could apply for the grant, and if accepted, would receive up to \$30,000 to fund the project. The funds could be used to pay team members a maximum of \$5,000 each for their work on the project, as well as purchasing any supplies or materials needed to create or adapt OERs. Recipients could also use the money to fund travel to conferences or events in support of the project.

2.1. Pellissippi State Enrollment Demographics

To better understand the impact that this project could have on student success and retention rates, it is important to understand the demographic makeup of Pellissippi State. Nestled in Tennessee's third largest city of Knoxville, Pellissippi State has four separate campuses, as well as a fifth campus in neighboring Blount County. Pellissippi State is the largest community college in the state, with over 10,500 students enrolled in 2019.³ For the last several years, females have made up roughly 53% of the student population, with the average age of students fluctuating between 22-23, mainly because of the increased enrollment of non-traditional students since the advent of the Tennessee Reconnect Scholarship. During the 2021-2022 academic year, over 66% of the student population received some form of financial aid, 35% of which was either TN Promise or TN Reconnect. The remaining 31% were Pell Grant recipients, a financial aid program designed to help low-income students afford college. Roughly 23% of the student population fall into one of the racial minority categories; yet they make up 35% of the Pell Grant recipients. What is more, Temple University's Hope Center for College, Community, and Justice conducted a survey on various insecurities students at Pellissippi State were facing and found that 37% were facing food insecurities regularly, 45% experienced housing insecurity, and 15% reported experiencing homelessness during the school year [10]. This is worth mentioning because the report was released before the COVID-19 pandemic. This helps explain the drop-in enrollment rates, as many students who struggled with food and housing prior to the pandemic did not return the following academic year.

Some other important data points regarding Pellissippi State's student population are retention and graduation rates. In 2020, the college retained just over 50% of its students, with graduation rates hovering just under 30%. These numbers are consistent with previous years, primarily because a sizable portion of students either move on to a four-year institution after the first year or choose to attend another college with their preferred degree program. Similarly, Pellissippi State has a steady stream of dual enrollment students each semester. These are high school students attending nearby high schools but opt to take college courses instead of honors or advanced courses through their high school. In 2021, 1,366 dual enrollment students (15% of total enrollment) were taking classes through Pellissippi State and most of them chose to attend four-year institutions upon graduation of high school. Unfortunately, these students are counted in retention rates, even though their intent was never to obtain an associate degree from the institution. Moreover, of the 1,366 dual enrollment students, only 254 of them were racial minorities. This percentage is lower than the overall percentage of minorities at the college reported above, suggesting that minorities are less likely to take dual enrollment courses than their peers who are white.

2.2. POLS 1030 American Government Grant Project

During the 2021-2022 academic year, which was the second year of TBR's OER grant project, a three-person team at Pellissippi State Community College was awarded funding to transition the college's introductory American Government course from a traditional textbook to the open textbook created by Rice University's OpenStax textbook. For roughly 10 years prior, the required textbook for the course was *We The People* by Ginsberg, Lowi, Weir, Tolbert, & Spitzer.⁴ The instructors of American Government at Pellissippi State desired to make the course fully dependent/sustainable on open-source information at no cost to the student. The team's analysis found that, although the context of American Government frequently changes, the core content of the course does not. For example, the history of the creation of the Constitution by the Founding Fathers, the concept of Federalism and its evolution throughout American history, the Constitutional Amendments addressing civil liberties and civil rights, the electoral process, and the structure of the federal government remain largely unchanged. However, political events and election cycles create opportunities for instructors to engage students with more up-to-date and relevant contexts through which to view these key terms and concepts. Almost every textbook that has been used or reviewed by instructors contains the same basic information on the American system of government. When new editions are published, they mainly provide recent election results, federal court case rulings, or events that shape the current political climate, all of which can be acquired through other forms of media content. The American Government faculty noticed a trend in previous semesters that

²For more information on the Tennessee Board of Regents OER grant program, see their website at <https://www.tbr.edu/academics/tennessee-open-education>

³The enrollment number provided reflects pre-Covid averages. Although this number has decreased within the last two academic years, PSCC is still the largest institution in the state. For example, during the 2021-2022 academic year, enrollment had dropped to 8,940; however, Southwest Community College, located in Memphis (the largest city in the state) only had 7,377.

⁴During this time period, the 10th, 11th, and 12th editions were being used. Depending on the edition and level of use, the textbook ranged from \$50-\$94. Digital versions were also available at \$45 for rental and \$60 for purchase.

students fall behind early in the semester because the student does not have access to the textbook (either due to finances or availability). The American Government course at Pellissippi State is offered in multiple formats (5-week, 10-week, and full-semester) both online and in-person. Instructors have found that students registering for the condensed formats are less likely to access the textbook by the time the section begins or choose to forego using the textbook altogether because of the short amount of time they are in the class. Based on the data provided in the previous table, the lower success rates among underrepresented groups are likely due to the inability to acquire the course textbook early on in the semester and this results in the student falling behind. An OER-supported course will enhance student learning by providing an easily accessible textbook that students will have at the beginning of the course, regardless of which format the student chooses. This will ensure students have proper materials as soon as the course begins and the materials will be made accessible to Pellissippi State students, regardless of learning style.

An important goal of the project was to create opportunities for students to have equitable access to course content and supplemental materials, regardless of race, gender, income, or learning ability. The team determined that finding and integrating an open access textbook to the course will provide immediate access to important content in a format that is most conducive to their style of learning. For example, even though OERs are almost exclusively available in a digital format, there would still be students who preferred to have a hard copy. So, the team had to ensure practical ways for this option to be provided free of charge. To overcome this obstacle, we had to look for a textbook capable of being provided in a hard copy version so that one could be on reserve in the college library on each campus in case a student prefers to use a hard copy of the textbook to accommodate students who benefit most from physical materials. Similarly, since accessibility is a primary value and requirement within TBR's grant process, the team either needed one that was readily available or would have the capability of becoming accessible through the transition and assimilation process.

After reviewing the textbook *American Government 2e.*, created by OpenStax, it was determined that this textbook contains the major precepts of American Government, as well as an adequate description of the historical events that have shaped the system of government. This transition allows instructors to use the online resource as the basic textbook for the course, while permitting them to integrate other open resources (news articles, recent federal court cases, most recent election results, etc.) to provide appropriate context for viewing these terms and concepts at work in the governmental system today. The team concluded that this course of action allows instructors to use a free online textbook to educate students on the major aspects of American Government, while integrating real-time data and events to help students examine the current context of these terms and concepts. Moreover, hard copies of the textbook could be purchased by the team and housed at campus libraries, and already met all the accessibility requirements associated with the grant.

2.3. Supplemental Course Materials

This project also enabled the team to develop additional

instructional tools to enhance both the quality of instruction for faculty and the quality of learning for students. Although OpenStax provides a PowerPoint slide deck for each chapter of the textbook for faculty to use, the team modified the content to ensure accessibility of materials and to include additional information and material to ensure the content reflected current events. Students also have access to the modified slide deck to use as supplement to, or in lieu of note taking, as well as to prepare for weekly quizzes and unit tests. A test bank for each chapter was provided by OpenStax for faculty members to use as needed; however, it had to be modified for use in the online learning management system used by the college. The team created accessible video tutorials that teach faculty and students how to access and utilize certain features connected to the OpenStax textbook and posted them on each section's LMS course page. The team regularly searched for additional OER material to enhance student learning, particularly topics related to current events. Another important open access resource that was included in the course curriculum was a series of online simulation scenarios. Pearson's PoliSci Lab provides political scenarios where students can play the role of a public official and try to achieve an objective that relates to situations where the faculty are studying the classroom. These simulations allow students to learn first-hand what is needed to be successful in the public sector.

To account for the relevance of pertinent political events occurring during the school year, the project team worked closely with the Library Services department to purchase subscription to several newspapers and magazines that report on current events. During the time period of the grant, the college's library was able to purchase a subscription to the U.S. Major Dailies. This subscription provides access to the five most respected U.S. national and regional newspapers, including The New York Times and Washington Post, co-exclusive access to The Wall Street Journal, and exclusive access to Los Angeles Times and Chicago Tribune. The titles offer researchers thorough and timely coverage of local, regional, and world events with journalistic balance and perspective. The content is available by 8am each day and provides archives stretching as far back as 1985 and is available on the ProQuest platform. Additionally, the grant purchased a one-year subscription to Foreign Policy magazine so students can access content relevant during the course content on American economic and foreign policy, interest groups, and the media. The subscriptions were intended to help both faculty and students stay abreast of current events happening in the United States, as well as how the U.S. interacts with other entities around the world. By having access to these resources, the research team was able to provide faculty with current and relevant articles and reports on current events to enhance class discussion.

2.4. Project Timeline

Upon receipt of the grant in July, the team began integrating the use of the OpenStax textbook for two online and one in-person sections of American Government in the Fall 2021 semester and making the newly integrated materials properly accessible. These sections served as "trial runs" for integrating the textbook into every section of the course. This allowed the team to address problems or issues they encountered in the fall semester prior to full implementation in all the sections in the Spring 2022. Doing this required the team to begin integrating the OpenStax

textbook and other open-source content into the existing curriculum over the summer of 2021 to ensure that the sections were ready for the Fall 2021 semester. The process included making it fully accessible to learning styles and needs among the college's student population. The team also purchased the digital subscriptions to Foreign Policy magazines and began compiling articles that address major concepts and topics within the course curriculum, in addition to adding the political simulations. The project included recording weekly video lectures for the online sections, most of which were recorded a week or two prior to the assigned chapter. At the end of the fall semester, students in the three piloted sections were asked to complete a feedback survey on their experiences with the OpenStax textbook.

In January 2022, the research team reviewed the survey responses from students, as well as the student perception surveys that all students are encouraged to fill out for each of the classes. No major issues were found regarding the structure or function of the course revisions. Instead, the only changes made were modifications to reading assignments that reflected more recent events. The two additional adjunct instructors of American Government were briefed on the course changes and the new textbook. They were also shown where the supplemental materials could be accessed, although they were not required to integrate any of simulations or current events article into their curriculum. Rather, the only requirement was using the OpenStax textbook. The research team also shared their preliminary results from the fall with Pellissippi State faculty and staff in a professional development session for the Pellissippi Academic Center for Excellence. Upon completion of both the Fall 2021 and Spring 2022 semesters, data was collected on student performance and retention. The section below summarizes the results and provides general conclusions on how using the OpenStax textbook impacted student performance in each section. These findings were then reported back to TBR at the end of the grant period, as part of their closeout requirements. The final requirement for the grant was that all materials created within the project had to be uploaded and stored on the TBR Open Access Hub portal so that instructors at other TBR institutions could have access to the materials at no cost. Below is a summary of the materials that

were created by the research team for the project uploaded to the TBR Open Access Hub:

- 15 separate PowerPoint slide decks were created or modified to reflect the material for each chapter covered in the course. These slide decks also meet state accessibility requirements.
- A test/quiz bank was created for all 15 chapters. There are 10 questions for each chapter.
- However, chapter questions can be combined into an either bi-weekly quizzes or 3 section tests.
- A video lecture was created for each of the 15 chapters, which details the OER chapter material and provides direct application to current events taking place over the last calendar year.
- A folder with news and magazine articles that relate to major key terms and concepts of American Government was also uploaded. These articles can be used as supplemental to help students identify or apply the concepts they learned in the chapter, or they can be used for in class or online discussions among students.

3. Fall 2021 Student Success and Retention Rates

As part of the application process, the research team provided retention and success rates of students that enrolled in American Government courses during the 2019-2020 academic year.⁵ One of the application requirements was to determine previous rates and use it as a marker for determining any changes upon successful integration of the OERs. Table 1 indicates that, during the 2020-2021 academic year, African American students had the lowest retention rate (84.2%) of any racial group. What is more, their success rate was 18% lower than their peers. Similarly, the data shows that males had lower success and retention rates than females. It is worth noting that these numbers are from the academic year that was greatly impacted by the COVID-19 pandemic. Although the Fall semester was not affected, all students at Pellissippi State enrolled during the Spring semester were forced into a virtual learning environment. It is possible that this new and challenging environment had adverse effects on both retention and success rates, especially since instructors had to modify course content and delivery methods.

<i>Student Enrollment</i>	<i>Gender, Ethnicity, Race</i>	<i>Retention in class</i>	<i>Retention Rate %</i>	<i>Success Rate %</i>
152	Male	134	88.2%	76.3%
188	Female	172	91.5%	76.6%
19	Black	16	84.2%	57.9%
282	White	253	89.7%	77.7%
39	Other Minorities	37	94.9%	76.9%

Source: Power BI Report ([Source for data](#))

Table 1: POLS 1030 Retention Rates by Race and Gender ('19-'20)

As previously mentioned, American Government sections in the Fall 2021 semester were split into two categories. Three sections piloted the new OpenStax textbook (two online and one in-person, while the other 3 sections (one in-person and two online) used the traditional textbook. Unfortunately, the research team was unable to break down the enrollment by race/ethnicity;

however, gender was factored in as a variable on the overall performance of both groups. A total of 60 students were enrolled in the sections piloting the OpenStax textbook, and 74 enrolled in the remaining sections using the traditional textbook. Table 2 compares retention and success rates for the two groups during the Fall 2021 semester.

⁵Because the application deadline for the grant was prior to the end of the 2020-2021 academic year, TBR requested retention and success rates for the "last completed" academic year. Therefore, the numbers for 2019-2020 were used in the application packet submitted by the research team.

<i>Student Enrollment</i>	<i>Gender, Ethnicity, Race</i>	<i>Retention in class</i>	<i>Retention Rate %</i>	<i>Success Rate %</i>
21	Male (OpenStax)	20	95%	90%
39	Female (OpenStax)	36	92%	87%
31	Male (Traditional)	29	94%	82%
43	Female (Traditional)	39	91%	76%

Source: Power BI Report ([Source for data](#))

Table 2: POLS 1030 Retention Rates by Race and Gender (Fall'21)

As a caveat, the total number of students in the OpenStax sections was lower than those enrolled in the sections using the traditional textbook. This should be considered when looking at the overall percentages. Fortunately, the Fall 2021 semester experienced roughly the same retention rate, but a higher success rate than the Spring 2021 semester. Spring 2021 had a 74.7% success rate among POLS 1030 students but that increased to 77.9% in the Fall. However, this cannot be attributed exclusively to the use of the OpenStax textbook. For example, only one section of the course was offered in-person during the Spring 2021 semester due to ongoing COVID-19 restrictions. Furthermore, enrollment numbers tend to be higher in the fall, as compared to the spring semesters. In sum, this small sample of data suggests that students using the open access textbook were less likely to withdraw from the course and more likely to receive a passing grade. This was true for both male and female students.

3.1. Fall 2021 Student OER Perceptions

Data from the feedback survey completed by students using the OpenStax textbook also suggests a positive response to using an open textbook as the primary resource within the course. Students were asked a series of questions to gauge their perceptions of the OpenStax textbook, with three of them operationalized into categories based on ease of use, importance of having a no-cost textbook, and usage of supplemental resources within the text. Unfortunately, there was not a 100% completion rate of all students in the three sections, as filling out the survey was optional and not factored into their final grade. Table 3 below provides a summary of these responses. As can be seen by the responses, the vast majority of students found the textbook easy to use and frequently accessed the special features embedded within. What is more, 95% responded that a no cost textbook was important to them.

<i>Question: How easy or difficult was it for you to navigate through our online textbook?</i>		
	Very Easy	56%
	Easy	39%
	Neutral	5%
	Difficult	0%
	Very Difficult	0%
<i>Question: How important to you was the fact that our textbook was available online at no cost?</i>		
	Very Important	86%
	Somewhat Important	9%
	Neutral	5%
	Not Important	0%
<i>Question: How often did you click on the special features provided in the online text?</i>		
	Clicked on every link	12%
	Frequently	43%
	Seldom	45%
	Never	0%

Table 3: POLS 1030 OpenStax Survey Responses Fall 2021

Students were also asked to provide written responses to another series of questions related to the preferences regarding digital or print textbooks. Although it is difficult to group all the responses into one of two categories, there was a clear consensus among students that the OpenStax textbook provided the same level of quality as traditional print textbooks. What is more, students consistently stated that they prefer digital textbooks because it is “one less thing to keep up with” or “carry.” What is more, students also felt that the ease of accessibility, especially on multiple devices, enhanced their overall experience in the course. While some students still expressed a preference for a print copy of the textbook, they felt that the price of \$50, purchased either

through the college’s bookstore, Amazon, or directly from the OpenStax website, was both reasonable and comparable to the textbooks in their other courses.

Based on the overall performance of students throughout the Fall semester, students were not at a disadvantage using the OpenStax textbook. Rather, it could be argued that they held an advantage over their traditional textbook peers since they had easier and more consistent access to their textbook without absorbing a financial burden. Students had immediate access to their textbook at the beginning of the semester and did not have to worry about coming up the funds to purchase it. The

next section will provide results of the Spring 2022 semester, in which all sections used the OpenStax textbook. However, prior to the start of the semester, additional steps had to be taken to bring additional faculty up to speed on the new resources and course content. The course template created in Brightspace provided the shell and material for all instructors to modify, as needed, to reflect the length and structure of their sections. PowerPoint slides created using the OER content were provided to all instructors prior to the beginning of the semester for them to review and modify, as needed. The test/quiz bank was also made accessible to all instructors, as well as access to Foreign Policy Magazine and news articles collected during the fall and spring semesters. These articles were to be used for supplemental readings and fodder for class discussions (both online and in-person). Finally, video lectures were provided to instructors teaching online sections.

4. Spring 2022 Student Success and Retention Rates

To adequately assess the impact of using the OpenStax textbook, the most reasonable comparison should be made to students from a previous semester in which all sections used the same textbook. Fortunately, data is available from both the Spring 2019 semester and Spring 2021. The Spring of 2019 was chosen for a couple of reasons. First, that semester was before the COVID-19 pandemic and reflected more consistent enrollment numbers Pellissippi State had experienced over the last several years. Second, using Spring 2020 does not account for the shutdown of the college in the middle of the semester as a response to the COVID-19 outbreak in the United States. By using a pre-COVID semester and a post-COVID semester, a more well-rounded assessment of the impact of the open access textbook can be ascertained. Table 4 below provides a breakdown of the overall retention rates for the three semesters that were observed.

Semester	# Of Students	Retention Rate	Success Rate
Spring 2019	126	88.1%	74.6%
Spring 2021	173	90.8%	76.3%
Spring 2022 (OER)	145	92.4%	82.1%
Source: Power BI Report (Source for data)			

Table 4: POLS 1030 Retention and Success Rates

A few observations are worth noting. First, as previously mentioned, students registered for the course before the COVID-19 outbreak consisted of more students from the underserved communities (racial minorities, low-income, and first-generation students). Although there were more students enrolled in 2021 (after COVID-19 had disrupted college campuses) there were fewer students from these specific groups. This could account for an increase in retention and success rates among students since racial minorities, low-income, and first-generation students tend to perform lower in the classroom. Second, more online sections were offered in both 2021 and 2022. This is important because students were given greater flexibility in their schedules to complete the coursework, as opposed to having to be in the classroom on a regular basis. While the risk of underperforming is present in online courses, they are likely to stay in the course, as opposed to withdrawing because of the course's flexibility. What is more, instructors admitted to being more flexible with the online instructional method because of its steep learning curve for students, especially those who have little experience with it. That may account for the higher success rates. Finally, and most importantly, the correlation between retention rates and success rates does not equate causation. In other words, retention rates do not always lead to higher success rates. Students can opt to stay in the course and receive a failing grade instead of withdrawing, especially since withdrawing could cause them to drop below the minimum number of hours needed to maintain their financial aid. However, the data shows a marked improvement in both retention and success rates from 2019 to 2021 and 2021 to 2022. More specifically, there is a

significant increase in success rates from 2021 to 2022, which may be attributed to the usage of the open access textbook in all sections. Again, since students were given access to the textbook at the beginning of the semester, they were less likely to fall behind by not having access to the essential resources. This could help explain the increased success rates since they had the tools needed to complete assignments at the outset of the semester.

Next, the breakdown of the students by the demographics mentioned above (gender and race) will help determine if underserved groups were more successful in the course after the integration of the free textbook. As can be seen in Table 5a, African Americans performed lower than the other racial categories and males performed lower than females. This data correlates with what is reported in Table 1. We also see lower success rates among this demographic compared to their peers; however, there is improvement in both retention and success rates for African Americans, as evidenced by the data in Tables 5b and 5c. Similarly, females performed better in 2022 than the previous semester, despite a slight dip in retention rates during the 2021 semester. Other racial minorities also showed improvement in success rates during 2022,⁶ as well as males. In sum, the data clearly shows higher success rates (and retention rates in most categories) in 2022, as compared to the previous Spring semesters. While this can be solely attributed to the implementation of the OpenStax textbook, one can easily deduce that students were not hindered or disadvantaged using a free online textbook.

⁶Although the success rate percentage for Other Minorities in 2019 is higher than 2021 or 2022, the enrollment numbers are much higher in those semesters. If one accounts for the increase in enrollment, success rates are actually higher in Spring 2022.

Student Enrollment	Gender, Ethnicity, Race	Retention in class	Retention Rate %	Success Rate %
57	Male	47	82.5%	77.2%
69	Female	64	92.8%	72.5%
4	Black	4	100%	50%
112	White	97	86.6%	73.2%
10	Other Minorities	10	100%	100%

Source: Power BI Report ([Source for data](#))

Table 5a: POLS 1030 Retention Rates by Race and Gender Spring 2019

Student Enrollment	Gender, Ethnicity, Race	Retention in class	Retention Rate %	Success Rate %
67	Male	62	92.5%	74.6%
106	Female	95	89.6%	77.4%
15	Black	14	93.3%	66.7%
134	White	123	91.8%	79.9%
24	Other Minorities	20	83.3%	62.5%

Source: Power BI Report ([Source for data](#))

Table 5b: POLS 1030 Retention Rates by Race and Gender Spring 2021

Student Enrollment	Gender, Ethnicity, Race	Retention in class	Retention Rate %	Success Rate %
56	Male	49	87.5%	78.6%
89	Female	85	95.5%	84.3%
6	Black	5	83.3%	66.7%
114	White	107	93.9%	84.2%
25	Other Minorities	22	88%	76%

Source: Power BI Report ([Source for data](#))

Table 5c: POLS 1030 Retention Rates by Race and Gender Spring 2022

4.1. Spring 2022 Student OER Perceptions

Students in the Spring 2022 semester were asked to complete the same survey as those in the piloted courses during Fall 2021. Table 6 below provides a breakdown of the individual responses regarding usage and financial benefits. As previously mentioned, all sections of the course used the OpenStax textbook, leading to more survey responses. Yet, the numbers below are similar to

the respondents from Fall 2021. Most found the textbook easy to navigate and placed high importance on the fact that it was free. The only noteworthy difference this semester was that fewer students took advantage of the special features inside the digital textbook. This fact, however, does not detract from the value placed on having a free resource that can be accessed through a variety of digital mediums.

Question: How easy or difficult was it for you to navigate through our online textbook?		
	Very Easy	50.7%
	Easy	40.3%
	Neutral	7.5%
	Difficult	0%
	Very Difficult	1.5%
Question: How important to you was the fact that our textbook was available online at no cost?		
	Very Important	80.6%
	Somewhat Important	11.9%
	Neutral	6%
	Not Important	1.5%
Question: How often did you click on the special features provided in the online text?		
	Clicked on every link	3%
	Frequently	32.8%
	Seldom	58.2%
	Never	6%

Table 6: POLS 1030 OpenStax Survey Responses Spring 2022

Most of the written responses reflected satisfaction with the quality, though not superior to the textbooks in their other courses. On the other hand, several students expressed a desire for a print copy, as this allows them to highlight, underline, or flip between pages without clicking several buttons. These traditional methods of capturing information for use at a later date are still available in many digital textbooks, though not with the OpenStax textbook. Since the textbook exists on a website, there is no software system or features that can perform these functions. Despite these limitations, a popular feature among students was the search function, where students can search for a key word, term, or concept without having to scan throughout the text. This made it easier to study for quizzes or write their simulation reports. In sum, students were overall satisfied with the quality and convenience of the free online textbook and found it sufficient for being successful in the course.

5. Conclusion

The rise in technology and accessibility of digital media has challenged the status quo of the traditional textbook. Add to this the increased accessibility of higher education to generally underserved communities and demographics, need for low cost or free resources has grown in prominence. This preliminary study suggests that some disciplines could benefit from transitioning to open access textbooks without sacrificing the quality of course content. Students that use the American Government textbook by OpenStax showed slight increases in retention and success rates, compared to previous semesters that used a traditional textbook. Although integration of the OER cannot be seen as the singular reason for such progress, an unequivocal conclusion is that it did not detract from student learning or success. The findings from this study suggest a positive impact on learning, as well as the ability to integrate real time political events into classroom or online instruction and discussion.

5.1. Impacts of Transitioning to OERs

The greatest benefit of the OER to teaching regards immediate accessibility of the textbook for students. Instructors did not have to worry about students obtaining a copy of the textbook prior to or during the first week of classes. This has been an ongoing issue for students, as many of them use financial aid or scholarship funds to pay for books. However, they cannot access those funds until after attendance has been submitted, then processed. Students tend to fall behind or perform poorly than students who already have their textbooks. With a free online textbook, students can immediately access it and complete assignments due before the end of the first week (which is required for attendance to be reported). Students also expressed appreciation for the textbook. Several students stated it was very accessible, easy to read, and had additional materials embedded to enhance learning. Two useful functions are the search function, so students can look for key words when needed, and the vocabulary sections for students to reference when they encounter an unfamiliar term. Furthermore, students found that being able to access the book on multiple devices was extremely useful. Students could read it on a tablet, computer, or even phone. More than a few students remarked that it eliminated the hassle of always having to keep up with a textbook and bring it to class, even if it wasn't needed. With an online textbook, they always had it in class, so long

as they brought a device. I (Dr. Cragwall) had one student tell me (almost in tears) how grateful she was to have to pay for a textbook because she found out earlier in the day that she had to purchase a book for another class, and it was almost \$200. She said she would've had to drop my class if a textbook purchase was required because she didn't have any more money. These are the types of stories that affirm the team's decision to make this transition. Although, this transition did not come without any challenges.

5.2. Challenges to OER Transition Project

Arguably the biggest challenge to this project was integrating the OER into some of the sections during the fall semester. As part of the project, the research team wanted to use the fall semester as a "trial run" to prepare for integration in the spring. One in-person and two online sections were used in the fall to test the OER and new course materials. This required a relatively short turnaround in creating the new course template in Brightspace, as well as modifying slides and creating the new test bank. Due to other obligations of both instructors during the fall semester, much of the work had to be done in July and August, rather than throughout the fall semester. Fortunately, the work was evenly distributed between the two instructors to complete tasks in a timely manner. However, some of the winter break was used to refine some of the materials to ensure everything was ready for distribution to the adjunct instructors. Similarly, the transition within Library Services made it somewhat difficult to access current events materials in a timely manner for use in class sessions.

It is also worth mentioning that the college experienced a cyber-attack during the final week of the fall semester. This hampered the collection of data from students regarding their views on the OER and new course materials. An adequate amount of information was collected, but more likely would have been available without the inconveniences associated with the cyberattack. The attack also bled over to the spring semester, as the team was unable to present their work during the Teaching and Learning (T&L) Seminar in early January. Due to the tireless work being done by support staff at the college, the T&L had to be cancelled. This limited the team's ability to promote the work to all full-time faculty. While an information session was still conducted, there was low attendance because faculty were already fully engaged in their courses. The cyber-attack also required the college to re-create many webpages, and this hindered faculty, staff, and students from accessing the resources paid for by the grant. Although Library Services sites were not directly affected, the pathways to them were taken down, making it hard for people to find supplemental resources. Similarly, the cyber-attack limited the ability to enroll students in sections of the course, so enrollment was lower than expected for the spring semester. This event was an anomaly and not something to be expected in the future, but the other challenges the team encountered are likely to be experienced by teams seeking to make a similar transition.

5.3. Next Steps

Fortunately, several faculty members at Pellissippi State have expressed an interest in transitioning to OERs for their courses.

Some chose to apply for the third cycle of TBR grant, while others felt that it would just be easier to just adopt an OER, pending one is available. Members of the research team spoke with a couple of colleagues in the Education department, and they stated that there are several options from which to choose; however, their cohort would need to set aside time to discuss the matter. A notable suggestion for instructors considering the adoption of an OER should think through two primary objectives. First, faculty should determine if there are sufficient resources in existence that can be used. Adopting an OER versus creating one requires completely different skills and resources. Second, they must set aside time to discuss the options available and determine which ones should be used. However, in cases where there are insufficient resources, this primary issue will be taking the time to create materials that can be used in all sections, not just the ones taught by interested faculty. This is what the research has chosen to do for TBR's Cycle 3 grant.

5.4. POLS 1010 Digital Textbook Project

In April 2022, the current research team, with the addition of a faculty member from Digital Media and Web Design, received another TBR grant to create a free digital textbook for the college's Introduction to Political Science course. Although the context of Political Science as an academic discipline can change on a regular basis, the foundational content and primary material of the course do not. However, many of the current textbooks offered by publishers consist of a variety of material that is either excessive or incomplete. In short, these textbooks tend to provide too much information that is difficult to both teach and digest, or they do not have enough information to fully address the diverse subfields of the discipline. What is more, many extant textbooks are more expensive than ones used in higher enrollment courses, which can deter students from either purchasing the needed course materials or from taking the class altogether. Both issues have a direct effect on both retention and success rates in the course. Through this project, the team is developing a primary textbook to enhance both the quality of instruction for faculty and the quality of learning for students. This textbook will serve as the primary text for the course and will be supplemented with open-source material about current events related to the topics at hand. Students will also have access to a slide deck to use in lieu of note taking, as well as to prepare for weekly quizzes and unit tests. A test bank for each chapter will also be created for faculty members to use as needed. The team will create video lectures that will go over the chapter material in much the same way that in-person sections receive instruction. The team will search for additional opensource material that will enhance student learning, particularly through online discussions and

relevant news articles. Using existing resources through the college's library service, faculty will be able to access recent news articles and reports to enhance class discussion. In short, similar materials will be created to those from the POLS 1030 grant, with the notable addition of a digital textbook.

Open access publishing is becoming a viable alternative to traditional textbooks in higher education. It may not be feasible or even preferable in all disciplines, but the social sciences address terms and concepts that require the use of real time information that cannot be provided through the traditional medium of printed textbooks. More research is required to determine the generalizability and impact of OERs in the discipline of political science in addition to what has been presented here. However, some light has been shed on its impact on the community college environment and the tangible benefits it can provide underserved students.

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