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# Crowdsourcing and Self-Instruction: Turning the Production of Teaching Materials Into a Learning Objective

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## ABSTRACT

This article describes a lesson plan that harnessed students' abilities to generate new teaching material by constructing country timelines. This involved *crowdsourcing*, or the reliance upon task inputs from a large number of people to acquire information. The plan was motivated by an approach that conceives of learning as deriving from the joint activity of individuals with shared tools, and was geared toward promoting self-instruction alongside traditional lectures and exams. By relying on independent research and individual contributions to create a new teaching resource, the course facilitated strategic reading and peer learning and promoted a research-active learning environment. The experience encourages instructors to consider ways to use distributed learning in the classroom to make students both the producers and consumers of innovative content.

## KEYWORDS

Activity theory;  
crowdsourcing; distributed  
learning; pedagogy

## Introduction

Political science instructors face the challenge of trying to identify teaching resources that both engage students and promote skill development (Salter 2013). Sometimes the fact that teaching resources are not readily available can be a good thing, as it presents the opportunity to turn the production of the resource itself into a teaching opportunity. *Crowdsourcing*, or the practice of acquiring information or task inputs from a large number of people, can be used to encourage self-instruction through the creation of innovative teaching materials. The approach relies on a large number of relatively simple inputs to generate an output that is greater than the sum of its parts to support innovation, problem solving, and efficiency. An example can be found in “crowdfunding,” in which many small financial contributions are used to fund a large endeavor. In the classroom, this involves assigning a set of specialized but overlapping tasks to students that together form a cumulative product. It can also include redundancies and opportunities for cross-checking to ensure validity in the process.

Relying on students to generate and shape the learning content allows the instructor to devote more time to helping them analyze and synthesize it (Salter 2013). Salter (2013) provided an example of “crowdsourcing” student participation to support directed learning and information sharing in political science. Their strategy, which was applied to a 200- to 300-student course, required students to debate the merits of different case studies on an interactive online platform to inform which cases they selected to research. The collective

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responses generated data that influenced students' selection of cases, which was also validated by students' ability to vote for preferred topics or readings. Elsewhere, Anderson (2011) proposed using an online interface to store the interactions of student mentors and mentees and allow users to rate the quality of responses. Perger et al. (2014) also described an application in a course in which students contributed data to a collaborative-content site and rated others' contributions. A shared conclusion among instructors who assess the pedagogical value of crowdsourcing applications is that it makes students active participants in shaping the learning content and encourages the use of shared resources to support critical thinking.

This article elaborates on the topic of crowdsourcing in the classroom by recounting a recent example involving the use of student activity to create new instructional materials. My lesson plan for a course on Latin American politics required students to conduct guided research individually and then to work collaboratively to produce a timeline of events for one country, resulting in a compendium of historical outlines. Although the initial objective was to work with students to produce a teaching resource that could be used in future classes, the process of collecting and compiling information—in concert with class lectures on broader themes—had a positive impact that outpaced the value of the product itself. Students gained specialized knowledge that motivated them to participate in class discussions and facilitated thoughtful exchanges regarding the similarities and differences of countries in the region. In particular, the design encouraged students to practice strategic reading to answer basic questions and created opportunities for individual, as well as partner and group instruction. In the following sections I outline the design, discuss the impacts of the assignment on course outcomes, and conclude with suggestions for applying similar strategies in other teaching contexts.

## Background

In Spring 2016 I taught a 16-week 300-level undergraduate course on governments in Latin America. The course, which had no prerequisites and counted for three credit-hours, contained roughly 50 students, nearly all of whom were juniors and seniors. In designing the course, I based the lectures around a textbook that discussed contemporary politics in each country, with each chapter devoted to a specific country. The goal of the course was to characterize contemporary politics in the region by elucidating the unique paths of political development that each country had taken. I wanted students to be able to compare and contrast the way in which countries in the region had developed to explain some of their modern differences. As a supplement to the assigned reading, therefore, I searched for a resource that would provide an overview of major historical events in each country.

Readers who are interested in understanding the historical events that characterize political developments in Latin America have a plethora of published resources at their disposal. Unfortunately, however, almost none of them concisely and thoroughly depicts events in a manner that is quickly comprehensible and comparable across countries in the region. Detailed written accounts exist regarding the development of a particular country, as well as analyses that are focused on specific issues. Qualitative depictions of the history of the region as a whole are also available. Additionally, there are textbooks that provide general overviews and explanations of politics in Latin America. For the purposes

of gleaning nuanced historical events that constitute patterns of political development in the region, however, monographs, descriptive histories, and textbooks are lengthy and dense materials that seemed insufficient for my purposes.

In my own studies, one of the ways that I began to learn about a country was to look for timelines of the major events that characterized each country's development. A timeline refers to a way of displaying information by listing events in chronological order, which is useful for noting what happened and when. To supplement the textbook, I looked for timelines to summarize lessons and to help students keep track of the timing of changes across the region. There are, in reality, few if any reliable resources that summarily outline the events that characterize the history of political development for each country in Latin America. Online searches yield a number of websites maintained by individuals. For academic purposes, however, such personal sites are fraught with problems—they do not cite sources, there are no clear criteria for constructing the timeline, and many have not been updated for several years. A somewhat more reputable resource is timelines provided by organizations such as BBC News, but they are not extensive and they also do not cite source material. Given the seeming absence of a compendium of country timelines that I could teach from, I realized that doing the necessary research to outline historical events presented a unique teaching opportunity. Instead of presenting material to the students, I could design a project that would encourage students to seek out such information for themselves and use it to construct a resource for future use.

Relying on students to evaluate content and submit specialized knowledge to a larger project can be thought of as a form of crowdsourcing, in which a cumulative product is generated by delegating specific tasks among a large number of individuals (Anderson 2011). There are myriad examples in which content is generated based on the pooled inputs of a large number of individuals, especially in the era of social media and big data. Within political science, relevant examples include the Bright Line Watch U.S. Democracy Survey, which polled over 1,500 political scientists to assess the status of democracy in the United States, or the Varieties of Democracy Project, which consulted with nearly 3,000 country experts to produce a comprehensive dataset on democracy. Crowdsourcing depends on contributors with a certain level of skill to support complex tasks (Dontcheva et al. 2014). In the classroom, this represents an opportunity for knowledge production and student learning to be brought together, insofar as students can be made to use their research skills to make specialized contributions to a pooled resource (Griffiths 2004).

Beyond some of the more traditional assessment practices like quizzes and essays, which test students' abilities to recall a concept or to synthesize arguments, one way that instructors assess learning is by requiring students to identify, weigh, and present new information. In the form of a course paper, students often engage in outside research and use it to craft an argument and evaluate a claim. Many of the same skills that are involved in writing a research paper, such as consulting outside resources, evaluating content, and presenting evidence, can be used in a "crowdsourced" assignment. The main difference, however, is that the student's product is decomposed into a series of inputs that can be combined with that from other students to produce a larger aggregate product. This enables the instructor to delegate to students the responsibility for specific tasks or content areas that can benefit the entire class, and it provides the instructor the flexibility to incorporate student inputs throughout the course to reinforce teaching objectives. It is

not altogether different from assignments that require students to present to the class on a certain topic.

Designing a project that assesses student learning by requiring regular inputs of new information to produce a common product offers a number of pedagogical advantages. It can support distributed learning, or collaborative knowledge building, by encouraging students to pool resources to evaluate content (Hewitt and Scardamalia 1998). Delegating more complex tasks in a contextualized environment also promotes “authentic learning” to support problem solving and critical thinking (Montgomery 2002). Moreover, devising an alternative to the outside-of-class research paper, and integrating pieces of it into the classroom, is one way to break up the routine of lecture-oriented classes into smaller units of learning (Montgomery 2002). This approach to teaching is informed by Activity Theory (AT), which conceives of learning as deriving from the joint activity of individuals with shared tools (Russell 2002). According to Russell (2002), AT acknowledges that individuals are “active agents in their own development,” but not necessarily in control of the setting in which learning takes place.

In support of reinforcing lessons on contemporary politics in Latin America, and recognizing that a source of concise historical summaries was not readily available, I developed an assessment strategy that could potentially yield the desired resource. In lieu of a more traditional research paper, I structured class assignments around harnessing the abilities of the roughly 50 undergraduate students to conduct research and present evidence in the form of a timeline. The process would involve many aspects associated with individual research assignments, but would be individually tailored to encourage specialization and would be combined with opportunities for peer evaluation to ensure reliability. For the project to be successful, however, I needed to determine the tasks for which students would be held accountable; identify materials for them to use; create a schedule for completion; and assess the overall value of the activity.

## **Project outline**

The project required each student to select one country in Latin America and to conduct independent research to complete a spreadsheet of events. Using Microsoft Excel, I created a template that was divided into sections for noting major conflicts, important documents and laws, and changes in the executive. My focus on executive changes, conflicts, and written accords aimed to highlight activities typically associated with statebuilding in the region, which frequently entailed coups, armed uprisings, and constitutional changes. For major conflicts, students were asked to list the date in which the conflict event began, who was involved, and the outcome. Each student was liable for discerning what constituted a “major conflict,” which ran the gamut from violent strikes and protests to acts of terror and civil war. For important documents and laws, the students were expected to decide what agreements were important for the formation of their country. This included constitutions, treaties, and laws. Finally, students were required to list who held the post of executive in a given year. In some cases, the seat was hotly contested; in some of the most tumultuous years, multiple people rotated in and out of office as a result of military coups and civil conflicts. In years in which there were many executive changes (i.e., frequent military coups), students were not expected to name one particular executive but to describe the nature of executive changes in that year.

The resulting list of events that students identified had to be presented in the form of responses to a set of questions that was the same for all students. On the one hand, the assignment was very explicit about what the student had to document, which largely pertained to the “who, what, where, and when” for events related to specific topics. Insofar as it required students to identify specific details and organize them according to a template, the assignment provided a rigorous guide that students could follow. On the other hand, I did not impose a strict definition of what constituted an important event, thereby giving students the freedom to explore the case and make subjective coding decisions. It was the student’s responsibility, for example, to decide whether a particular dispute was formative in the development of the country. An advantage of having students adjudicate between events was to encourage critical thinking that depended on an understanding of the broader context. One disadvantage of letting each student make independent decisions, however, was that there would inevitably be variation in the events that they reported. My solution was to leverage the number of students so that there were multiple coders for each country.

To ensure that students consulted comprehensive sources, I preselected five books about each country and placed them on hold in the library for the duration of the assignment. These books largely consisted of single-country case studies or monographs that covered a broad temporal domain. Outside of class, students were required to consult their country-specific books and glean the most important events. Along with the academic sources made available at the library, students also had to identify five instructor-approved sources by which to complete the project. Each student thus received a foundation for conducting research but was also made to seek out additional information. For each event that they documented, I required students to cite the materials from which they got the information.

Constructing the timelines was done in two parts. First, students had roughly two months to independently conduct research on the history of their assigned country, denoting major events by completing the questions in the spreadsheet. At the time of the midterm exam, I collected electronic versions of the spreadsheets and graded them for completeness and accuracy. Upon receiving the graded assignment, students were then placed in groups based on their assigned country and required to work together to come up with a combined version. Students collaborated in cross-checking and comparing the information that they had independently found with that of other students working on the same country, providing a form of intercoder reliability.

In addition to cross-validating each other and deciding which events to include in the final draft of their timelines, the student groups were also required to describe each event in one or two sentences. This emphasized not only the ability to identify information, but to summarize and present the information in original words. The final product that each group was expected to turn in was a spreadsheet listing the date in which each event occurred along with a corresponding description of the event. Each student thus received a midterm grade based on the detail of their individual spreadsheet, and each group of students also received a final grade based on the quality of description. Concurrent with the undergraduates’ work, I had graduate research assistants performing the same task. As a second check for intercoder reliability, therefore, I compared the combined product of the undergraduate students with the chronologies created by the graduate assistants. I also personally read through each of the chronologies as part of the grading process, making revisions as necessary.

## Results

By the midterm, all of the students had completed the assignment and submitted modified versions of the template. The average was just over 100 entries, although the number of entries varied between 42 and 186. The variation in the number of entries was largely due to differences in the duration of executives and the number of conflicts across countries—among students working on the same country, submissions only differed by an average of about 15 entries. At the end of the course, each group of students also submitted a descriptive timeline. While most of the final submissions correctly noted changes in the executive as well as major conflict events, there was greater variability in what students reported with regard to notable laws. Aside from changes in the constitution, much of the legislation that students focused on concerned land redistribution, the extension of female suffrage, and the nationalization or privatization of industry.

An important question surrounding the final product is whether students were capable of producing objective, value-neutral outlines based on historical events. In large part, this was shaped by the content on which the assignment was based, as well as by interactions between students and my guidance. By requiring students to focus on nouns—the people, places, and things that constituted events—the assignment helped to avoid normative judgements. As for *why* such events occurred, students' answers were informed by academic resources written by historians and political scientists. Nevertheless, the multiple checks for validity—having students scrutinize their individual outputs in groups, comparing it to the graduate-coded information, and fact-checking the final products to determine grades—served to moderate the potential for student biases to affect the results.

After grading the assignments, I went back and added events that I thought were important and batch-edited the spreadsheets. I then combined the spreadsheets and converted them into a manuscript using a document preparation system called LaTeX, which enabled me to typeset the information and input maps and figures. The finished product was a 180-page manuscript comprising historical timelines for 19 countries in Latin America, which had undergone three internal checks. The principal outcome of the project was the creation of a cross-validated resource based on cited material that I could use in future courses.

Although the assignment had the distinct flavor of a data collection project, its impact on the classroom and student learning greatly overshadowed the tangible product. First, the project supported skill development in academic reading and comprehension. College demands extensive but careful reading, for which many students are just beginning to learn how to discern valuable information and devising reading strategies (Caverly, Nicholson, and Radcliffe 2004). In requiring students to gather material from a small but dense set of qualitative sources, the project aimed at helping them develop the ability to read strategically in order to quickly absorb new material. The project also encouraged “authentic learning,” which is defined by the application and use of knowledge (Montgomery 2002). It gave students enough constraints to know what was expected of them, but was flexible enough to allow them to seriously think about the context that drove political developments in the region.

Additionally, requiring students to work together to integrate their individual work structured opportunities for peer learning by making students compare notes (Boud, Coehn, and Sampson 2001). Delegating responsibility also enhanced student involvement; by taking on the role of “country experts,” students were able to make individual

contributions to the broader good (Lea and Nicoll 2002). For each of the lectures on the contemporary politics of a particular country, the respective students who had covered it used it as an opportunity to speak up and clarify issues. Students therefore gained specialized knowledge that motivated them to contribute to in-class discussions and increased participation. This was notable in more general discussions about issues affecting the region as a whole, in which students took different stances based on their understanding of a particular country. Students also applied the country-specific knowledge that they had acquired in essay responses on exams, which augmented their ability to back up their arguments to general questions about politics in the region.

Finally, going from start to finish on a research assignment as a group exemplified the research-teaching nexus that instructors often strive to reach. By combining the creation of timelines with class lectures and exams, the project helped to promote teaching that was research-led, -oriented, -based, and -informed (Griffiths 2004). A shared interest in the “production and application of specialized knowledge” encouraged student learning in a research-active environment (Griffiths 2004). On its own, crowdsourcing is not always conducive to complex creative tasks (Dontcheva et al. 2014), but it can be enhanced by drawing on multiple materials and by instructor support. This emphasizes the use of information and communication technologies as “part of a range of media used in specific social and cultural contexts of learning and teaching” (Lea and Nicoll 2002, 3).

## Conclusion

Although the primary goal of the project was to guide students in the generation of a resource that would be useful teaching material in future classes, I found that the process generated a number of direct benefits for the students. The requirement of reading outside materials and identifying important information supported typical teaching objectives, such as helping students to practice strategic reading and individual research. Given that the class was mostly upper-level students, it provided a context for them to practice existing skills rather than to acquire new ones. Inasmuch as the project adapted those skills to provide simple inputs—conducting research from selected materials and answering basic questions in the form of a spreadsheet—it did not require expertise on the subject matter but accumulated the responses for application in class. It therefore encouraged the use of existing skills in a nontraditional way, but in so doing made the students active consumers of content related to the topic. As a result, some of the responses in the teaching evaluations included “I feel extremely well-rehearsed in the history and current events of Latin American governments,” but also that the assignment was “novel and a really good experience.”

Other students indicated their appreciation for an assignment other than a course paper: “It was especially fun when each student had something interesting to add during the normal lectures from knowledge learned from the timeline.” Additional responses emphasized students’ perceptions that they were enabled to shape the skills and methods by which the course was taught, and that the class adapted to their learning styles. In general, therefore, the approach was successful because it allowed students to develop specialized knowledge on their own, but to do so in collaboration with their fellow classmates and in consultation with their instructor.



Now that a centrally organized resource exists, I can incorporate it into classes by having students analyze the events and use them to explain divergent patterns and differences in the contemporary politics of countries in the region. The experience has also led me to consider ways in which I can apply the same strategy elsewhere in the classroom. More importantly, however, I have since learned that one of the foremost benefits of “crowdsourcing” the production of a central output is the ability to delegate simple tasks that draw on students’ skill sets and to use that to guide course discussions and the application of knowledge in the classroom. The group nature of content generation seemed to give purpose to even the most basic assignments and to reinforce student learning.

Subsequent to my experience, a colleague replicated the project in a later iteration of the same course. They reported similarly positive results, with students being active participants in course discussions and in the generation of shareable material. In that class, students remarked on evaluations that “the timeline projects were fun to learn about individual countries.” My colleague also changed one of the research categories to include economic events, which added another dimension to the project. We have since discussed collaborating in future courses to augment the material that we can use to teach from and potentially create a student-friendly textbook. I have also participated in university-led workshops with local high school teachers to discuss how student skills can be used to generate teaching materials and augment learning outcomes.

There are several lessons that can be gleaned from the experience. The first is that standard evaluation methods—such as the course-long paper—do not have to be the norm (Montgomery 2002). Rather, there are a variety of ways in which teachers can encourage and assess student learning in the classroom. The second is that there are often underutilized skills and resources available to the instructor to augment student learning, some of which are attributable to the students. In designing courses, instructors should consider the ways in which their students are capable of adding to teaching goals. Regardless of the subject, viewing students as a resource for creating educational material encourages self-directed learning and engagement that offers benefits for the students as well as the teacher.

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## Notes on contributor

**Matthew Charles Wilson** received his PhD from the Pennsylvania State University and is currently an Assistant Professor in the Department of Political Science at West Virginia University. His research concerns the interactions of autocratic leaders and institutions, particularly with regard to regime change and conflict outcomes. Some of the courses that he has taught include theoretical approaches to studying dictatorship, Comparative Politics, and governments in Latin America. As a comparativist, he has a special interest in the politics of Latin America and in historical developments.

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