

From Research-Based Learning to Research Output: Lessons from an Undergraduate Course in Germany

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ABSTRACT


Research-based learning adopts a “learning-by-doing” approach toward teaching research. This article documents the experience of publishing a coauthored article with undergraduate students that grew out of a research-based–learning course at Humboldt University of Berlin, Germany. In particular, I reflect on the opportunities and challenges of engaging undergraduate students in research. The article demonstrates that research-based–learning courses must maintain a balance between the research process and research output. Too much focus on output overlooks students’ need to gain substantive knowledge, and the exclusive emphasis on the research process might reduce their motivation. Generally, students appreciate the autonomy and horizontality of relationships in research-based learning. Furthermore, the article shows that the knowledge and skills gained by students through research-based–learning courses facilitate their engagement in follow-up research projects, thereby paving the way for publishing research.

Research-based learning adopts a “learning-by-doing” approach toward teaching research (Dewey 1910, 1938; Knoll 2016).¹ It is a prominent approach to interlink research and teaching (Healey and Jenkins 2009; Schooler 1981). Through research-based learning, students independently conduct research projects individually or in a group and, in the process, learn how to do research (Deicke, Gess, and Ruelß 2014; Mieg 2019). Research-based learning, in fact, has been on the rise in many countries worldwide (Brew and Jewell 2012; Brew and Saunders 2020). The evidence suggests that research-based learning has positive student-learning outcomes, including improved subject knowledge, and that it leads to affective-motivational gains (Wessels et al. 2021; Willis, Krueger, and Kendrick 2013).

This article documents the experience of publishing a coauthored article with undergraduate students that grew out of a research-based–learning course at Humboldt University of Berlin, Germany. In particular, I reflect on the opportunities and challenges of engaging undergraduate students in research. This article contributes to the literature by showing that research-based–learning courses must maintain a balance between the

research process and research output. Too much focus on output overlooks students’ need to gain substantive knowledge, and the exclusive emphasis on the research process might reduce their motivation. Generally, students appreciate the autonomy and horizontality of relationships in research-based learning. Furthermore, the article demonstrates how the knowledge and skills gained by students in research-based–learning courses facilitate their engagement in follow-up research projects, thereby paving the way for publishing research.

The course, which I independently designed and delivered, was accepted as part of a competitive call for applications for research-based–learning courses by the *bologna.lab* at Humboldt University.² Entitled “Democracy in Divided Societies: 50 Years of Power Sharing,” the course was offered as an optional module for undergraduate students in the Department of Social Sciences at Humboldt University. It took place in the 2019–2020 winter semester during 16 weekly in-person sessions between October 2019 and February 2020. Twelve BA students attended the course: four German students and eight exchange students from Australia, Bulgaria, Brazil, Canada, Egypt, France, and Taiwan. This cross-cultural diversity was definitely an advantage, as affirmed by several students in their in-class discussions. After completion of the course, four students volunteered to continue and expand on the research already accomplished to get it published in an academic journal. The result is a coauthored review

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article that was published in *Government and Opposition* that synthesized the power-sharing literature (Farag et al. 2022).

RESEARCH-BASED LEARNING IN PRACTICE

The research-based-learning course analyzed in this article aimed for students to learn about power sharing by conducting a scoping review of the power-sharing literature published between 1969 and 2018. The course's learning outcomes included developing students' ability to understand and explain the different types of power sharing, divided societies, and a scoping review; applying the latest methodological advances in undertaking scoping

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reviews; analyzing the content of articles to judge whether they meet the scoping review's inclusion; and understanding exclusion criteria and evaluating the quality of other scoping reviews.

The course used Arksey and O'Malley's (2005) scoping-review methodology, which develops the research question, retrieves the relevant studies, excludes studies that do not meet the inclusion criteria, charts the data, and summarizes and reports the results. The course was nongraded (i.e., pass/fail). Passing the course required working in a group to write four short papers, five pages each, that also were presented in class.³ Each paper was aligned with one of the scoping-review methodology phases, as follows:

- identifying the initial list of studies and the details of the search process, including keywords and databases used to retrieve articles (due in session 6)
- shortlisting the identified studies using specific criteria in line with the research question (due in session 9)
- synthesizing the preliminary findings from the data analysis (due in session 12)
- presenting the final analysis (due in session 16)

Each paper was assessed in terms of content, structure, formatting, and style. I provided feedback to the groups on each paper, highlighting their strengths and weaknesses.

For this purpose, the 12 students who joined the course self-assigned themselves into three regional groups: Africa and the Americas, Asia and the Middle East, and Europe. The process of group formation was smooth, facilitated by the manageable number of participating students. They were required to choose which group to join after the third class, which allowed them time to get to know one another. Each group answered the following research question in their region of interest: "What is known from the existing literature published between 1969 and 2018 about how power sharing contributes to democratic stability in the respective region?" Although this division of students had the unavoidable drawback of unequal group membership (i.e., three, four, and five students per group), it was essential to ensure motivation and continued interest on their part.

The initial course syllabus (see online appendix 1) included a preparatory phase of three sessions: an introductory session, a substantive session on power sharing, and a methodological session on the scoping-review methodology. Two lessons emerged from this phase. First, setting the boundaries for group work was essential for its success. In the course syllabus and during the first session, I emphasized that there is no place for free riders. In practical terms, this meant that they had the option to expel any group member if they were not contributing to the work of the group. If this happened, it would be the responsibility of the expelled member to find another group or drop the course;

fortunately, this did not happen. In hindsight, students mentioned in their evaluation that this policy was good motivation for group members to do their share of the work.

Second, it was crucial to ensure the autonomy of groups and to give them space to self-organize and practice group democracy. Students were given time to develop ground rules (table 1), which emphasized the importance of respect, responsibility, accountability, and cooperation among students. Each group also elected one member to act as a group facilitator, who ensured that the group was on track to meet deadlines and combined the contributions of all group members when submitting the papers. The groups even had the right to practice a no-confidence vote at any point in the course if a group facilitator was not doing their job—an option that none of the groups used. The groups also were free to develop their own ways of organizing their work. One group used WhatsApp to meet every Friday to discuss their progress; another group created a Slack space to communicate and discuss their work.

In the first research phase, students started delving into the research process. This phase included the primary, foundational task of retrieving published academic articles written about power sharing. Each group was tasked with collecting studies written about countries in their chosen region and adding them to an online project using the research-management software, Citavi. This task included identifying search terms and databases to be used for the search. By the end of the first phase, students had compiled 620 power-sharing studies retrieved via databases including Google Scholar, JSTOR, Scopus, and Primus Ex-Librus (i.e., Humboldt University of Berlin's library database). In addition, each group wrote a five-page paper, which also was presented in class, that described the findings of their research during this phase and the challenges they faced. The main lesson from this phase was that students had omitted some power-sharing studies because the groups used different search terms and databases. However, this was tolerated to encourage learning.

The second research phase entailed excluding studies that did not meet the inclusion criteria that the students had developed. The exclusion criteria were collectively agreed on among the three groups. Of the 620 studies identified in the previous phase, students ultimately included 150 academic articles for the

Table 1

Ground Rules Developed by Students

Category	Rules
Communication System in Class	Raise one hand for questions. Raise two hands for reactions to earlier comments.
The "Be" Rules	Be clear. Be honest. Be flexible. Be reachable. Be responsible. Be accountable. Be transparent. Be open-minded to other opinions.
The "Let's" Rules	Let's respect each other. Let's respect deadlines. Let's not interrupt each other. Let's contribute to the discussions. Let's distribute group work equally. Let's help each other (e.g., understanding texts). Let's listen to others' opinions and views. Let's give a chance to everyone to express their opinions. Let's disagree but, in the end, respect each other.

data-extraction phase. Toward the end of this phase, I noticed that the students' motivation had begun to fade, which I observed by their degree of engagement in class discussions and in discussing group work with their peers. To understand the reasons for this reduced motivation, I organized a midterm reflection exercise in session 8 using Poll Everywhere, a free online tool that allows real-time presentation of answers to questions using mobile phones and laptops.

In this exercise, I asked students about the clarity of the course objectives, the factors facilitating or hindering their learning so far, and their unanswered questions—both substantively and methodologically. The idea was to confirm whether the course still met their expectations. Given the complicated tasks of a scoping review in terms of collecting articles, shortlisting them, peer-reviewing the work of others, and extracting data, I had expected the students' questions to be related to the scoping-

This phase, therefore, yielded important lessons about how research-based-learning courses must maintain a balance between the research process and research output. Too much focus on output overlooks the students' need to gain substantive knowledge, and the exclusive emphasis on the research process can reduce their motivation. Similar to other research-based-learning courses, this course was designed so that the subject knowledge automatically would follow the application of the scoping-review methodology—however, this was not the case.

To reestablish the balance among the research process, the core of research-based learning, and the students' interest in learning more about power sharing, I restructured the course syllabus. (See online [appendix 2](#) for the revised syllabus.) Four sessions were divided into two parts. A significant part of sessions 11–14 was devoted to addressing the students' unanswered questions about the theory and empirics of power sharing. In addition, I attempted to accommodate their interest in connecting theory and policy by organizing a policy lab exercise in session 14. As part of this exercise, students were divided into groups to discuss the implications of various power-sharing policy proposals for the cases of Sudan and Nigeria. Moreover, to reduce their workload, I combined the third and fourth papers into one 10-page paper per group, in which students were to synthesize the findings of the scoping review in their region.

Students also were allocated time at the end of each session to discuss their progress in completing the final research phase. This phase concentrated on data extraction along the following variables: bibliographic information (e.g., article title, author, date, and journal); theory and concepts (e.g., research question, terms used to describe power sharing, and the power-sharing definition used); research design, measurement, and contextual information (e.g., names of countries or cases studied, research strategy, time period and method of analysis, how power sharing is measured, and power-sharing institutions studied); and empirical findings (e.g., positive and negative effects of power sharing and favorable factors).⁴ Students extracted data from a total of 101 academic articles and then analyzed the data and wrote group papers that they presented in class.

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review methodology. However, they mostly had unanswered theoretical questions on power sharing. As one student stated bluntly in their anonymous answer in the self-reflection exercise: "the focus on scoping review" hinders learning in the course. In particular, students had unanswered questions about the theoretical origins of the power-sharing theory, the favorable factors facilitating the success of power sharing, the various ways power sharing is measured, the findings from the quantitative literature on power sharing, and how to translate power sharing into policy proposals.

theory. In any case, the restructuring clearly facilitated the achievement of learning outcomes. The final papers written by the groups, which synthesized their data analysis, built on the theoretical parts that were introduced after the restructuring. In their papers, they demonstrated a good understanding of the key terms required in the course—namely, "power sharing" and "divided societies." Through their synthesis of the findings of the extracted data, students were able to draw an accurate picture of the positive and negative effects of the various types of power sharing on outcomes such as peace and democracy in their respective region

of interest. In addition, their papers highlighted contradictions in the findings of qualitative and quantitative studies on power sharing.

Reading and listening to other presentations on power sharing in other world regions helped students to understand the regional differences and how power sharing works in various contexts. Moreover, it was clear in the three papers written by the student groups that they had a clear understanding of the scoping-review methodology—in particular, applying the exclusion criteria, extracting data from shortlisted articles, and synthesizing the findings. In summary, the restructuring of the course contributed to meeting the planned learning outcomes, both the substantive elements of understanding the power-sharing theory and the methodological elements of applying the scoping-review methodology.

PUBLISHING RESEARCH WITH UNDERGRADUATE STUDENTS

At the completion of the course, students were invited to volunteer to continue the scoping review. As a result, four students expressed interest in expanding on the work accomplished in the course and in attempting to publish the research in an academic journal. In lieu of remuneration, they were promised equal coauthorship for published research. The course acted as an intensive training program for students. By the end, they had a good knowledge of both the power-sharing literature and the scoping-review methodology. The first step was to clarify the timeline for the students to have an idea about the required level of effort and time commitment. Table 2 lists the time frame and the executed tasks.

In addition to the work finished during the course, the plan was to publish the article within 18 months. Because the four students were planning to go to graduate school and potentially remain in academia, they realized the value of publishing a coauthored article in this early stage of their career. Nevertheless, it was made clear to them that publication was not guaranteed but that we would do our best to increase our chances. Their motivation was obvious given that three of the four students, who were exchange students in Germany during the course, had returned to their universities in Canada and Australia. However, having met in person during the four-month course facilitated our subsequent virtual interaction.

Table 2

Work Plan for Publishing a Coauthored Article with Students

Time Frame	Tasks
2 Months	Excluding studies that do not fit the inclusion criteria.
1 Month	Internal quality check of excluded studies.
4 Months	Data extraction and internal quality check.
2 Months	Data analysis and first draft of the paper.
1 Month	Conference presentation of the paper and sharing the draft with some scholars for feedback.
2 Months	Revisions based on feedback received.
4 Months	Submission for publication and waiting for editorial/peer review.
2 Months	Revisions based on feedback.

When we realized the need to bridge the gaps in the research that was completed during the course, we immediately restarted the scoping-review methodology. In practical terms, this meant using six identical search terms on three established research databases: Scopus, the International Bibliography of the Social Sciences, and Political Science Complete. The initial search generated 3,171 peer-reviewed articles written on power sharing in English between 1969 and 2018. This list was distributed evenly among the students and me to exclude duplicates, which other team members later cross-checked. After this stage, 1,723 articles remained, some of which already were excluded during the course. This resulted in 1,621 articles, which then were divided equally to exclude those that did not meet the inclusion criteria developed during the course.

Based on the exclusion phase, the total number of articles decreased to 886, excluding the 101 articles finished during the course. The lesson from this phase was the importance of being flexible and accommodating. One month after we started our work, the COVID-19 pandemic surfaced in the countries where we were based—Australia, Canada, and Germany. I proactively wrote to the students saying that we could continue the work and remain flexible in the case of any emergency. When a student requested an extension for study or personal reasons, this was accommodated and shared transparently with other students, which provided a sense of security during uncertain times.

Given the high volume of articles, the data-extraction phase was divided into four sprints, a method used in agile management (Lieberum, Schiffels, and Kolisch 2022). In practice, this meant tasking each group member with extracting data from 45 articles in 45 days. The articles were divided among the students based on their regional interests as previously established during the course. The main lesson learned from this phase was the importance of dividing large, time-consuming tasks into smaller segments that students realistically could accomplish. Although this extended the time needed for data extraction from four to six months, it was essential to avoid burnout.

After data extraction, the students and I cleaned the data. During data cleaning, 18 articles were excluded after meeting some exclusion criterion. When we generalized this margin of error from the data-extraction phase, the coding reliability and consistency were at 95.39%. One lesson emerged: this high reliability would not have been possible without the research-based-learning course the students had completed. Their knowledge about power sharing and the scoping-review methodology was an important base, without which our follow-up research either would not have been possible or would have taken significantly more time.

After cleaning the data, an outline for a draft paper was created. Sections of the paper were divided equally among the students and me. Our draft paper was well received when it was presented at the 2021 Annual Conference of the UK Political Studies Association. The paper also was shared with an academic expert on power sharing, who provided constructive feedback that further sharpened the paper. Based on this feedback, the paper was revised. It subsequently was submitted to *Government and Opposition* and eventually published (Farag et al. 2022).

The process of coauthoring and publishing an article was satisfying for the students in two main ways. First, having a published paper in such an early phase of an academic career was rewarding, given the ever-increasing competitiveness in

academia. Therefore, students were pleased to see that their hard work finally materialized in the form of a published article. After reading the draft paper, one student coauthor emailed all of us stating:

I am excited to see the paper coming together! Thank you all for the hard work over the past year despite the difficult circumstances... [for] putting so many hours into organizing and distributing the tasks and, of course, putting it all together. I took a lot away from working on this and I am glad I got to contribute despite losing motivation at times.⁵

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After publication of the article, another student coauthor said in an email: “It has been such a pleasure working on [the project] ...and with the rest of the team. It’s so rewarding to see all of the work that went into this come to fruition; at the start, it felt like a distant future!”⁶

Second, students gained further insight on power sharing based on their experience of coauthoring the article. The engagement of students in collecting and analyzing data at a scale much larger than during the course led them to delve deeper into the theoretical and empirical foundations of power sharing. After finishing our first draft, we had a reflection call in which we discussed the next steps and our learning. In the call, the student coauthors highlighted the broader perspective that they had developed about power sharing, including why the implementation of power-sharing agreements differs among contexts. They also highlighted research gaps in the literature, such as the dominant study of formal vis-à-vis informal power-sharing institutions and the differences between quantitative and qualitative studies on the effects of power sharing.

CONCLUSION

What does this experience reveal about the involvement of undergraduate students in research? First, research-based learning is a promising area for teaching students how to conduct research (Knoll 2016). It also is distinguishable from other teaching methods by including a reflection element (Huber 2019). For instance, after each phase, students were asked to reflect on their challenges that then were discussed with potential solutions proposed. Through this exchange and group reflection, students improved both their subject and methodological knowledge.

In research-based learning, nevertheless, it is essential to maintain a delicate balance between the research process and the research output by establishing two parallel tracks for theory and method. The theoretical track ensures that students gain subject knowledge throughout the process rather than compressing it at the beginning and the end of the course. The second track is about methodology. The parallel-track design could mitigate the loss of motivation that students face during the course, which generally characterizes research-based learning (Wessels et al. 2021). It would be easy simply to tell students what is required and ensure that there are no gaps in the scoping review from the

very beginning; however, this would compromise students’ learning and autonomy.

It is fair to conclude that the results of research-based-learning courses are not eligible for publication. It is what students learn both substantively and methodologically that enables them to conduct research in a later stage. In this case, the course acted as a filter for students; only those who saw the value in having a published article volunteered when they realized what this meant in practice. Three of the four students who coauthored the article are in graduate school, however, it is an unanswered question

whether their academic interests were the reason that they joined the research-based-learning course or vice versa (Willis, Krueger, and Kendrick 2013). The students’ voluntary engagement in this project without monetary compensation amid a global pandemic indicates their intrinsic motivation independent from the course.

Second, students enjoyed the autonomy they had in the course. They came to understand and appreciate the added value of research-based learning in terms of closer interaction with group members, a horizontal relationship with the instructor, and the collective bond of working on a single project. Of course, students had deadlines to meet, but they had control over their chosen region, how they divided the work in the group, which search terms they used, which databases they searched, and how they summarized the findings. Some of this autonomy led to decisions that later taught them what they could have done better. Also, being a nongraded pass/fail course relieved students from competing for an “A” grade; they focused instead on research and learning.

Third, the training received by instructors on research-based learning is of utmost importance. Through my work in civil society before shifting to academia, I was exposed to Freire’s (1970) seminal work *Pedagogy of the Oppressed* long before I taught the course. This was key for informing my choice to establish a horizontal relationship with the students during the course and afterward during our coauthorship. The course and subsequent coauthorship reinforced my self-perception about the importance of horizontality between instructors and students in research-based-learning courses. This horizontal environment is one area that was unanimously well received during the midterm reflection exercise as well as in the final course evaluation. In the early phases of the course, I perceived my role more as a facilitator than as a lecturer. After restructuring the course, I was the lecturer, at least in part, to deliver the theory information requested by the students. Thus, I argue that in research-based learning, academics might have different roles at different times based on how the course is structured and the students’ needs.

The bologna.lab at Humboldt University of Berlin provided a supportive institutional environment for research-based learning. For example, I participated in an eight-month program on research-based teaching and learning in higher education. The program consisted of lectures on and insightful exchange among instructors of research-based-learning courses. This was extremely useful and

highlights the importance of institutional support for research-based-learning initiatives at academic institutions (Jenkins and Healey 2015).

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SUPPLEMENTARY MATERIALS

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CONFLICTS OF INTEREST

The author declares that there are no ethical issues or conflicts of interest in this research. ■

NOTES

1. Sometimes research-based learning is referred to as “inquiry-based learning” or “explorative learning.” To maintain consistency, this article uses “research-based learning.”
2. The idea for the course, officially called Q-Team, originated during my doctoral studies at Humboldt University of Berlin. Although my dissertation examined regime-opposition dynamics in the Arab world, I developed an interest in how power sharing works in other parts of the world. The course, therefore, was one way to channel my substantive interest in the topic and to teach in a research-based-learning environment. For more information about the bologna.lab, see <https://bolognalab.hu-berlin.de/en>.
3. The third and fourth papers subsequently were combined into one as part of restructuring the course.
4. For more information, see Farag et al. (2022).
5. Personal communication with Hae Ran Jung; March 25, 2021.
6. Personal communication with Satveer Ladhar; August 5, 2022.

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