

The Poster as a Writing Assignment

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Abstract

Many undergraduate econometrics textbooks have a chapter on how to carry out an empirical research project. While the research process is clear, the writing process remains vague. To help students with this type of project, I have constructed a poster assignment as a “first draft” of their paper. The poster assignment accomplishes several things: it forces students to clearly lay out their question, hypotheses, data, and results; it requires the exploration of data in a visual medium, which has separate benefits with respect to interpretation and analysis; it allows for a variety of feedback from the audience viewing the posters; and it allows the instructor to give comments at this stage specific to the empirical design instead of being bogged down by reviewing writing structure.

I. Introduction

It is important for economics students to be able to clearly convey their thinking through writing. As Schmeiser (2017) notes, writing is not only useful in working life but also because it helps show the thought process and understanding of economic questions. Hansen (1993) talks about teaching a writing intensive labor economics course to meet the dual goals of writing and learning economics. A decade later, Cohen and Spencer (2003) discuss modifying a history of thought course to integrate the “writing across the curriculum” approach. Smith, Broughton, and Copley (2005) note that the study of writing in an economics course is valuable because good economic writing and good economic reasoning go hand-in-hand; by identifying what makes good economic writing (focus, logic, clear assumptions, etc), one’s economic reasoning will also be improved.

In addition to forcing students to think about the logic of their economic arguments, writing in economics has also been an essential component of the economic research process. Greenlaw (2006) has an entire book on “Doing Economics”, which helps think through the process to do and write good economic research. To integrate this type of experience in a course setting, Klein (2013, p268) provides a review of the literature that discusses the benefits of a capstone-style course in economics that contains significant research projects. As the author summarizes, it is a course that targets the highest of Hansen’s proficiencies (creating new knowledge) as well as the top of Bloom’s taxonomy (analysis, synthesis, and evaluation).

While writing lengthy research papers may be effective for learning and doing economics, that particular writing style may not be the type that students will use most upon graduation. Simpson and Carroll (1999) investigated how majors use writing after graduation to inform the creation of writing assignments that both improve writing and enhance student knowledge of economics. The authors found that graduates needed to be able to write clearly, concisely, and effectively towards a specific audience.

This paper advocates for including a research poster assignment as a component of a research project in an undergraduate econometrics course or capstone-style course. The assignment will serve to both improve the quality of the learning and understanding of empirical methods that is at the heart of the course content, while also providing students the opportunity to develop useful communication, presentation, and writing skills that a research paper by itself would not provide.

II. Effective writing assignments

Instructors across disciplines struggle with lack of quality writing, and, correspondingly, lack of quality thinking, in their courses. Two big problems with writing are lack of organization and clarity and efficiency of writing.¹ Three things that may help improve outcomes associated with writing are feedback, recognition of the recursive writing process, and help with organizing ideas. Quality writing assignments would help target these three areas.

Feedback is often seen by students at the end of the process. And, since they are so interested in the grades, Hansen (1993) says students will rarely pay attention to feedback on suggestions for improvement since the process is over. Cavdar and Doe (2012) advocate for creating feedback loops during the writing process instead of after. Keh (1990, 294) explains that “feedback is the drive which steers the writer through the process of writing on to the product.” Feedback coming from peers or instructors can help let the writer know if she has misled or confused the reader either through lack of organization or lack of content. In terms of the best vehicle for feedback, many argue that conversational feedback can be more useful. By having a dialogue with students in a one-on-one or group conference, the instructor can talk through issues and point things out while also providing an opportunity for students to ask questions. By communicating this way, two problems with written comments may be solved:

¹ Cavdar and Doe (2012) identify eight problems associated with poor writing skills in a political science class, many of which fall under these two main ideas.

comments are harder to dismiss since the student is an active participant in the conference and the student doesn't walk out with a checklist thinking that if everything on the checklist is fixed the paper is perfect. A poster assignment would break the expectation of the student receiving feedback on a written document, thus perhaps creating space for feedback (and the expectation of feedback) that is based on ideas and organization rather than writing style.

Feedback has its independent merits, but having rounds of feedback also helps students recognize the recursive nature of writing. As Lin et al (1999) note, effective reflection makes the author's thinking visible, which can help identify areas of concern and ways to improve. Quality reflection would not just be about addressing the surface concerns but would force the student to think about the process behind the writing. Cohen and Spencer (1993) identify this issue of cursory reflection and revision. If students adhere to a linear writing approach (step one is draft, step two is editing, step three is the final paper), the writer can move onto the next stage without ever returning to the thought behind the first draft. In this case, the students aren't engaged with writing as idea generation, they just end up producing weak papers that may (or may not) be grammatically correct. Great companion writing assignments would force students to become more skilled writers that move around the steps as needed as they discover new arguments and clarify relationships. My hope is that a poster would take students out of this linear writing process by introducing an assignment that wasn't purely about the written word. By forcing students to reflect on their research project at an early stage in a visual way, students could get feedback on the content of their research, think about the organization of their research project, and see more easily how the research process is recursive before ever writing up their results in a long-form paper.

III. Poster assignments

Posters are nothing new; they have been around in academic circles, mainly the sciences, for decades. Maugh (1974) notes that the United States lagged behind Europe in using posters as a way to present research. Posters first appeared at academic meetings at the 1974 Biochemistry/Biophysics meeting in Minneapolis as a response to a lack of time to present all submitted papers. At this academic meeting and those that followed, participants found that having a poster session not only allowed more people to be able to present, but facilitated greater social interaction. People are able to explore the research that is of particular interest or to browse generally, in both cases asking questions and having a dialogue with the author rather than a formal Q&A session.

Posters have been used in the classroom, often as a substitute for a term paper. Hess and Brooks (1998) discuss assigning a poster instead of a paper with the goals of increasing the amount and sources of feedback, providing students with opportunities to share their work with an audience instead of one professor reading a paper, and forcing students to articulate the big picture and the small details of their project. Howson (2008) also assigned a poster in place of a paper as way to provide innovate learning strategies in a sociology class. Both cases find mostly positive benefits, the main one being students can focus on content rather than being preoccupied with grammar and writing structure. On the downside, students were often apprehensive about this new type of assignment, showing confusion about expectations and even the mechanics of how to prepare a poster.²

Instead of replacing a paper assignment with a poster assignment, I see advantages from using the poster assignment as a precursor to a formal paper assignment. Damron (2003) lays out such a strategy for a political science class. The benefits of as poster assignment can be tied back to the three characteristics of a quality writing assignment discussed in Section II: feedback, recognition of the recursive writing process, and help with organizing ideas.

² Two resources to aid in thinking about the creation and assessment of a poster assignment can be found with Hess et al (2009) and North Carolina State University website on creating effective poster presentations.

Feedback with a poster assignment and companion poster session can come from a wide audience. In addition, the feedback is focused on content instead of lower-order grammar issues. Students can also get clarity on feedback because they are able to ask follow up questions during a poster session; this prevents the checklist mentality of written feedback and promotes a deeper understanding of the reason for specific comments. The poster also inherently provides an opportunity for reflection and introduces a recursive element to the research process. Since the poster is focused on content not writing, feedback from posters goes towards revising research not revising writing. This forces students to reflect on the analytics and empirical foundation of their research question. Finally, the poster helps students organize their paper by forcing them to think about the logical organization of their paper. Similar to McCloskey's (1985) suggestion of using index cards to organize ideas, the poster helps the student see patterns and think about arrangement and transitions in how best to present their research.

IV. Implementation

The assignment

In my class, the poster assignment is one element of a course-long empirical project. The goal of the empirical project is to provide students with the opportunity to come up with their own research question, collect data, perform regression analysis, and present the results. See Appendix A for the handout I give out on the first day of class which briefly describes each of the elements. By presenting this scaffolding early in the term, I hope to make students aware of the ongoing nature of research. I emphasize that the question, data, and analysis can/may change at each stage of the process. In addition, by having due dates throughout the term, students are not able to think that they can do the research the weekend before the research paper is due.

As each of the deadlines approaches, I present details of the specific assignment. See Appendix B for the handout I give for the poster assignment along with the rubric I use to grade the poster assignment. The rubric is given to the students along with the instructions so students know they will be graded on both content and presentation.

An important requirement of the poster is relevant, effective visuals. Over the years, different disciplines have recognized that the visual display of information allows an audience to more quickly process, interpret, and apply the data than if presented in numerical tables or in a written form. DeBoskey and Doran (2012) review research that has shown that vision is the dominant human sense and research that shows that spatial intelligence enhances use decisions. Just like good writing, good visuals should help the audience think analytically; as Tufte (2006) notes, “presentations should be constructed so as to assist with the fundamental intellectual tasks in reasoning about evidence: describing the data, making multivariate comparisons, understanding causality, integrating a diversity of evidence, and documenting the analysis” (p. 137). By making data visualization a required component of the poster, students are forced to grapple with data issues and empirical evidence in a visual way, not just a statistical one.

Lessons on the visual display of information

We spend three class days discussing elements related to the creation of posters and data visualizations. One day is spent reading Edward Tufte and talking about elements of good visual design.³ There are three main components to an effective visualization: (1) content, (2) efficient design, and (3) aesthetic execution. All three are essential in creating a visual that will have impact and resonate with an audience. Without content, a pretty picture doesn't tell you anything. If you don't choose the right design, the greatest story cannot be told. And if the

³ I have them read Chapters 1 and 9 from Tufte (2001).

visualization is not pleasing to the eye, the audience will not be receptive to the information and will not spend time processing the visual.

The second day is spent in the computer lab learning how to present data in different ways using Excel, Stata, and Tableau⁴. No matter the content or design, there are basic steps to creating a good visual. Wong (2010) presents four stages in creating a visualization: (1) finding the data, (2) editing the data, (3) plotting the data, and (4) reviewing the data. Once the dataset is assembled, decisions then have to be made with respect to how to use the data. While data are often collected in level form, it is often necessary to convert the data into another form for use in the analysis. Greenlaw (2006) lists the different forms data can take: per capita, changes, percentage changes, proportions, nominal versus real, and indexes. The choice of the right form of your data can make the difference between merely presenting data and presenting a message. Plotting the data draws from the discussion on the previous day on design and aesthetics. In addition, choices about scale, axis, labels, and legends have to be made. These elements all help facilitate interpretation. Finally, the review process is the most dynamic step in the process and one which may force the researcher to go back to step one. At this stage, one is evaluating the final visualization to see if it makes sense. Are there outliers, and, if so, is this a data error or an indication that there is something important to investigate further? Does the evidence point to an omitted variable that should be investigated? While this step in the process ends with a finished visualization ready for presentation, the review process itself is another opportunity to refine the research question, collect the best data, and investigate the hypothesis in different ways.

The third day is spent talking about good poster design. For this class, I pull examples of academic posters I have found online and students, working in groups, identify good and bad

⁴ Tableau offers free academic licenses for students and academic computer labs.

elements of each poster.⁵ I have found that by choosing posters unrelated to economics, students are able to focus this particular discussion on design, structure, and function rather than content.

The poster session

I schedule the poster session roughly two-thirds of the way through the academic term. The session is held after all classes are done for the day which allows other economics faculty as well as former and future students to attend the poster session. The session is scheduled for one hour. Half of the students stand by their posters and then switch roles with the other students thirty minutes in. Students are instructed to have an “elevator pitch” ready to give when people come up and inquire about their poster. Faculty and former students have proven to give helpful specific suggestions about possible omitted variables or changes to the empirical design. Students also see value in the types of questions they get about their posters. Sometimes a question indicates the topic has not been presented clearly, and students are able to consider how they should frame their question or present their results differently.

V. Results

There are benefits and costs to adding a poster to a course project. The payoffs may vary depending on the length of course, type of student, and availability of resources. The assignment was carried out in a class size of 15-20 students at a liberal arts college. Students here are required to take this empirical methods class for the economics major. Most students will go to the private sector after graduation and thus will utilize the soft skills more than the hard economic research skills that the empirical project requires. Thus, the addition of the

⁵ See “An Effective Poster” from NCSU as one resource for poster examples and critiques.

poster session seems to add more of the soft skills and clear writing skills that employers will be looking for.

Benefits

The main benefits from the poster session are improving the quality of the written paper and building presentation skills that students can transfer to other settings. I have students reflect specifically on the poster assignment. Comments from students about how the poster session impacted their research include:

Helped me visualize what my research was actually doing.

Gives me a clear vision for what I really want to do in my research.

Listening to other people's research is helpful for my project.

The first few parts of my paper were pretty much in the poster.

Getting preliminary results helps to see where problems in the model/data are and gives time to fix them before the draft is due.

The poster helps organize and outline the flow of ideas. I don't think the poster will help me write my paper other than by making me define clearly what my question, data, etc. was.

It allowed me to see where my problems were early in order to make adjustments for the future.

A lot of things changed between the poster and paper writing. It helped solidify my question.

I was able to incorporate and test variables that I previously would have missed. Questions were also posed that I would never have thought of and were included in my hypothesis and future research.

Many of these comments line up directly with what Damron (2003) found.

In addition some students noted the positive externalities from creating a poster for this specific empirical project:

The poster lets me show something concrete besides a paper.

Do not get rid of the poster session. It is really nice as a student who has never done research to see their research start to come together. It gives us confidence to write a good paper.

It is something that we rarely get a chance to do but yet is so important in terms of presentation. It is also help to be forced to summarize and extrapolate the most important parts of the project on such a relatively small space.

Costs

The implementation of the poster assignment can create additional costs for the instructor. If utilized as a complement to instead of a substitute for a paper, the poster represents another work product to grade. To have the students produce posters that allow them to reap the benefits described above, additional class time will have to be devoted to establish expectations and build skills that help students complete the assignment.

VI. Conclusion and future ideas

I have incorporated the poster session as part of the econometrics project since the fall of 2012. Despite the class time it requires, I have found the benefits to greatly outweigh the costs. It has resulted in better quality research, clearer and more concise papers, and has provided students skills that they would otherwise not have received in their economics coursework. Going forward, there are a few ideas which may increase the benefits even further at a relatively low cost. Hess and Brooks (1998) carried out formal evaluations after the poster session. Every student was assigned two posters to evaluate formally and there were two faculty to evaluate each poster, so that each student received written feedback from four people (2 faculty, 2 students). Formal feedback from multiple sources would also force students to learn how to evaluate feedback and incorporate the best quality and most feasible feedback into their project. Another idea relatively easy to implement is offered by Keh (1990) who recommends group conferences early in the process. Group conferences reduce the time spent by the instructor in individual meetings and also let students listen and learn from others' questions. A more significant addition is suggested by McElroy (1997) who recommends that professors do original research alongside of the students. Through this mentor-demonstration model, the professor would present mini drafts of each assignment in advance of when the due date was for students. While this would require significant additional energy and dedication

from the professor, the real-time example would prove valuable for the students and might be a nice way for professors to test out new research ideas.

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Appendix A

Empirical Research Project

GOAL OF THE PROJECT

I have assigned this independent empirical project in order to give you exposure to gathering your own data, conducting analyses on that data, and succinctly summarizing the results you find. This is an important skill that will be useful to you in any profession.

ASSIGNMENTS

All assignments together count for 40% of your course grade

- I. February 4: Proposal (5%)
 - What question do you hope to answer? What is your initial hypothesis?
 - Why is it interesting?
 - Is the project feasible? What data is available?
- II. March 4: Model, Data and Annotated Bibliography (5%)
 - Write down the anticipated model for estimation
 - Explain the mechanism for the hypothesized effect
 - Describe collected data: source(s) and variables
 - Annotated bibliography of previous research on topic (data and models used). Should have at least 5 sources on annotated bibliography.
- III. April 1: Poster Session at 2:30pm (15%)
 - Presentation of model, data and evidence
 - Get feedback and ideas from the rest of class and the economics faculty
- IV. April 13: Draft and dataset due for peer review
- V. April 22: Peer review due (10%)
- VI. April 30: Final paper and dataset due (65%)

STRUCTURE

The final paper should be about 15 double-spaced pages in length. Once you get started, this may seem like a limitation, but it is important to develop writing skills that force you to convey your message in a concise way. Additional pages that present your STATA results or appropriate graphs would not count against this limit.

SUGGESTED FRAMEWORK

- I. Statement and motivation of problem: why interesting?
- II. Review of previous literature
- III. Formulation of a model: choice of model, choice of variables, predicted relationships
- IV. Data sources and description: where did you obtain data and what measures are you using
- V. Model estimation, hypothesis testing, and robustness checks: reporting of methods used and why they are appropriate
- VI. Interpretation of the results
- VII. Conclusion: limitations of analysis and/or ideas for future analysis

Appendix B

Poster Session

When

- Wednesday, April XXth at 2:30pm, Riley 109
- Need to put your file in Box by 8:30am on Monday, March XXth

What

- You will stand by your poster and talk about your project.
- Other faculty and students will attend and will walk around to learn more about your projects and give you feedback.

Why

This poster session serves two purposes:

- (1) Gives you experience with graphics and presenting information in a visual format.
Posters/Presentations are an excellent means of communicating ideas or results quickly!
- (2) Allows you to get feedback from others on your question, hypotheses, model, and data.
Be ready to give an “elevator pitch” of your project!

Content of Poster

- Title and author
- Research question and why it is interesting
- Hypothesis: statement of the testable hypothesis
- Methodology: theoretical basis (mechanism/story), empirical model, data description
- Preliminary Results: graphs and summary statistics of key relationships
- *Future steps and/or References (if appropriate)*

How you will be graded

- Content: written and visual
- Design: clarity, form meets function, good use of graphics, and organization

Things to Keep in Mind

- Give yourself enough time to complete your poster and get it printed.
- Posters are not the same as papers. They're more like billboards. They rely more on graphics and images to carry their message.
- Posters should be good-looking enough to attract attention, and clear enough to communicate your ideas or research results.
- Do not overcrowd your poster with too much text, too many colors, or a background color or image. Use simplicity and clean design (remember Tufte!) to get your message across. Too much text is the number one reason people don't read posters.
- Produce clearly defined sections. Make things obvious.
- Arrange your poster for "flow", typically from upper left to lower right, to guide the reader.

Poster Grade

Content

Looking for content that is presented clearly and contains relevant information

	Below Average	Average	Above Average
Research question			
Hypothesis			
Methodology			
Preliminary Results			
Other (Future steps)			
Relevant, effective visuals			

Design

Visually pleasing, application of Tufte principles, design aids in understanding

	Below Average	Average	Above Average
Text/Graphics balance			
Quality of graphics			
Ease of reading			
Organization and Flow			
Overall Appearance			

Overall Grade _____