

Chief Reader Report on Student Responses: 2018 AP[®] Research Performance Task: Academic Paper

• Number of Students Scored	9,640			
• Number of Readers	185			
• Score Distribution		Exam Score	N	%At
		5	1,103	11.4
		4	2,287	23.7
		3	3,864	40.1
		2	1,911	19.8
		1	475	4.9
• Global Mean	3.17			

The following comments on the assessment of the 2018 academic papers for AP[®] Research were written by the Chief Reader, Matthew Krain of The College of Wooster. They give an overview the performance tasks and provide insights into how students performed, including typical student errors. General comments regarding the skills and content that students frequently have the most problems with are included. Some suggestions for improving student preparation in these areas are also provided. Teachers are encouraged to attend a College Board workshop to learn strategies for improving student performance in specific areas.

Performance Task: Academic Paper

Topic: Varied by student

Max. Points: 10

Mean Score: 6.01

What were students expected to demonstrate in this performance assessment task?

This performance task was intended to assess students' ability to conduct scholarly and responsible research and articulate an evidence-based argument that clearly communicates the conclusion, solution, or answer to their stated research question. More specifically, this performance task was intended to assess students' ability to:

- Generate a focused research question that is situated within or connected to a larger scholarly context or community;
- Explore relationships between and among multiple works representing multiple perspectives within the scholarly literature related to the topic of inquiry;
- Articulate what approach, method, or process they have chosen to use to address their research question, why they have chosen that approach to answering their question, and how they employed it;
- Develop and present their own argument, conclusion, or new understanding while acknowledging its limitations and discussing implications;
- Support their conclusion through the compilation, use, and synthesis of relevant and significant evidence generated by their research;
- Use organizational and design elements to effectively convey the paper's message;
- Consistently and accurately cite, attribute, and integrate the knowledge and work of others, while distinguishing between the student's voice and that of others;
- Generate a paper in which word choice and syntax enhance communication by adhering to established conventions of grammar, usage, and mechanics.

How well did the response address the course content related to this question? How well did the responses integrate the skills required on this question?

NOTE: The holistic rubric focuses on the following course proficiencies. The bulleted list below illustrates how students demonstrated strengths with these proficiencies.

- Overall, most students showed familiarity with the basic expectations of the academic paper. Extensive student effort was evident in almost all of the papers. Students showed more consistency in application of the course's skills than in the past two readings, regardless of discipline.
- In *Understanding and Analyzing Context*, most students developed innovative, interesting, or timely research questions with appropriate degrees of focus, and situated their research questions within a broader context. Many students effectively argued why their question required additional research or examination. Some students developed carefully crafted and well-reasoned questions that were clearly linked to a broader context, gap in our understanding, or relevance to a community of practice. In addition, many students' literature reviews used their analysis of past scholarly arguments to show that their studies needed to be conducted to help the understanding of the field.
- In *Understanding and Analyzing Arguments*, most students effectively reviewed scholarly literature relevant to their inquiry. Most were able to critically analyze scholarly works and summarize multiple perspectives within the relevant scholarly literature on their research question or topic of inquiry. Many students developed sophisticated literature reviews in which they placed sources in conversation with each other and many were able to situate their research in the field of practice placing them in conversation with each other.
- In *Evaluating Sources and Evidence*, students mostly drew upon credible and relevant sources in situating their questions within a larger context and in developing their arguments. Most students demonstrated an understanding of and fluency with scholarly sources.

- In *Research Design*, most students demonstrated an understanding of the need for a systematic method or approach to their question in order to generate data to analyze. Many were able to describe reasonably replicable procedures followed in the chosen method or approach. Some students effectively explained the link between the approach and their question and showed an understanding of ethics, sample selection, and procedure for collecting data. Some students linked the approaches used in the literature they reviewed to their own study, or adapted approaches used in the literature to their own research. Some were good at describing limitations of the method or approach chosen.
- In *Establishing (Their Own) Argument*, most students stated a clear argument or claim while some recognized and acknowledged limitations on their ability to extrapolate conclusions from their evidence.
- In *Selecting and Using Evidence*, many students were able to provide some evidence from their research to speak to their question of interest and some were able to support their conclusion using relevant and sufficient evidence from their own research. Some students provided evidence to speak to their conclusion, but it was evidence from other studies in the academic literature, or other already existing information.
- In *Engaging the Audience*, most students organized their papers in a manner that made it easy for the reader to follow the argument, the method/approach, and the examination of the evidence. Many used organizational and/or design elements effectively, while most students demonstrated the ability to organize their information to convey meaning (a skill initially developed in AP Seminar and built upon in AP Research). Many students wrote in a style that was easily accessible to an intelligent non-expert reader.
- In *Applying Conventions*, most students used a consistent style throughout the body of their paper and in their works cited or bibliography section and most attributed sources, many using appropriate citation style. Most students used established conventions of grammar, usage, and style, though some did so with variety, emphasis, and precision, thereby enhancing communication.

What common student misconceptions or gaps in knowledge were seen in the responses to this question?

- Overall, student work has shifted greatly from last year. Rather than papers struggling to report the “bare bones” concept of research, a majority of academic papers are now struggling to capture the nuances of elevated research reporting – rationale, justification, and synthesis of student-generated data within the scholarly community, implications and limitations of student data within the context of their specific field and/or focus.
- In *Understanding and Analyzing Context*, some students developed broad or exploratory topics that lacked a pointed research question or a clear focus. Some identified a narrowly-focused question but did not carry this narrowed focus throughout the paper. Some claims made in the introduction in order to situate the question in a context were overly broad and uncited or otherwise unsubstantiated. Some students asserted rather than demonstrated that a gap existed in our knowledge. Many used hyperbole in discussing the importance of their topic or the novelty and significance of their findings. A few students employed multiple questions, or changed their main question throughout the paper, making it difficult for them to focus their inquiry. A few students presented a position on a topic rather than develop a research question that could be explored through the process or inquiry.
- In *Understanding and Analyzing Argument*, some students did not firmly establish their research within a scholarly community. Some students provided background information about the topic of inquiry, rather than a review of the scholarly literature. Many students discussed multiple works in their review of the literature but did not explicitly relate these works to one another or to their own argument or perspective. A few discussed a single perspective within the literature on their research question (even if it was via discussing multiple authors with a similar perspective), while some students had difficulty discussing and/or incorporating perspectives different from their own.

- In *Evaluate Sources and Evidence*, a few students focused too much on discussing the credibility of individual sources rather than establishing their own credibility through the use of sources that are relevant and credible in context, and clearly connected to their inquiry. A few students relied heavily on sources that were less than relevant or credible given the context of their inquiry.
- In *Research Design*, while most students identified which method or approach they were using, many either did not address why they chose this approach to answer their question or did not describe in sufficient detail how they employed it. In some cases, a student’s method did not align with the question they were trying to answer or the evidence they needed to collect in order to test their argument. Some claimed to be using one method while using a different one. Most students who described their approach as a meta-analysis, content analysis, a “systematic review,” the Delphi method, or even historical analysis did not actually conduct original research, but rather engaged in an extended second literature review. Some students who chose to analyze quantitative data provided incomplete statistical information. Some students used multiple methods in a less structured and focused manner, rather than using one method effectively. Some justified methodological choices based on convenience or feasibility rather than on what would be most appropriate or necessary to address the research question or project goal. Many students did not provide enough detail so that their method or approach could be reasonably reproduced while others who used surveys in their research did not connect their choice of questions to their inquiry. Some students conducting surveys did not include the actual survey in the paper and were not always clear as to how and why they chose the sample they used. Sometimes that sample was too small to draw meaningful inferences from. Many students who worked with human subjects did not indicate that they had pursued institutional review board (or human subjects research board) authorization, nor did they have a section in their paper that addressed ethical issues and explained how risks to subjects had either been minimized or avoided.
- In *Establishing (Their Own) Argument*, a few papers were unclear on the distinction between the literature, the student’s specific argument, the method used, and the evidence. Many students summarized their conclusions but did not put their research or evidence into a bigger context.
- In *Select and Use Evidence*, some students did not substantiate links between their own claims and the evidence they presented from their own original research. Some students attempted to link their claims to evidence from the literature, but did not provide their evidence from their original research. Many of the papers that utilized surveys collected data from a convenient sample audience or lacked enough responses to adequately develop an argument. Some papers presented publicly-available data that did not lead to a new understanding without a manipulation or new analysis. There was more emphasis this year on discussing the limitations and implications of their research, although many students focused more on barriers to their ability to complete the project or limits of the method chosen rather than an effort to connect their results back to the gap they identified, the new understanding, the conversation within the academic community, the community of practice, and other implications beyond their own efforts.
- In *Engaging the Audience*, some students had issues with organization that made it difficult for the reader to follow the thread of the argument or the layout of the project design. Some students used hard-to-read, hard-to-interpret, oversimplified, or under-explained graphs or charts to present their findings. Some wrote in a more conversational style, rather than in a style appropriate to a research paper. A few students exceeded the maximum word count and a few students submitted papers/PDFs that were incomplete, missing pages, or in some other way were not a final version.
- In *Applying Conventions*, a few students did not appropriately cite images, tables, graphs, or figures in their papers and some did not label them clearly or appropriately. A few used, but did not describe or analyze, images/figures. Many students did not clearly, consistently, or accurately cite claims or information of others in text and some did not clearly differentiate between the voice of others and their own voice. Some students employed quotations or summaries of sources without integrating them into the paper in a cohesive way. Finally, some students engaged in sloppy scholarship, and in rare cases overt “cut and paste” plagiarism.

- In *Applying Conventions*, some students did not proofread their papers carefully, and/or did not correct errors of grammar, style, or mechanics that interfered with communication. The in-text citation and bibliographic citations of students illustrated that some students may not understand the rules of citation. Teachers need to teach students how to accurately cite their sources.

Based on your experience of student responses at the AP® Reading, what advice would you offer to teachers to help them improve the performance of their students on the exam?

NOTE: The holistic rubric focuses on the following course proficiencies. The bulleted list below illustrates how students demonstrated strengths with these proficiencies.

- Overall, teachers have done a wonderful job in helping students move from wrestling with the basics of systematic research to conducting original research using an explicit method or approach. Students have a better understanding of how to take the skills learned in Seminar and apply them in a substantively different way in Research. Teachers can help students facilitate this important skill transfer by continuing to emphasize how the task in Research differs from that in Seminar, thus requiring different research and writing strategies.
- Establish a relationship with the rubric prior to teaching the course every school year. Require students to also establish this same relationship. If students can use the rubric to help guide their thinking about published work and/or peers' projects, it will help them in making sure their own projects meet the rubric's expectations.
- Emphasize that research is a process, one that requires time, reflection, problem solving, and revision. Teach students that the research process is a social and community-based endeavor, where researchers are in conversation with other scholars, and learn from others' comments, ideas, and findings.
- Encourage students to use the PReP to document and reflect upon the process, and to help stimulate their own creative thinking. Use the PReP to make that process visible, to prompt student reflection, and to enable you to provide both positive and constructive feedback.
- Encourage students to find peers to share ideas and drafts with. Utilize peer review early and often. This allows project development and writing to go through iterations, rather than be constructed in sections without revisiting them as students add to their papers. Peer review also gives students valuable experience as presenters of their work and as consumers of the scholarly work of others. It also emphasizes the idea that research is an iterative and recursive process.
- Encourage students to find expert advisors with whom to discuss their projects, and to help students ensure they perform research appropriate to the field. Also encourage students discuss their limitations/conclusions with an expert advisor. Readers noted that students who reported working with an expert advisor, particularly on methodology, performed better than students who did not.
- Reach out to nearby colleges or universities. This could help with understanding human subjects/IRB issues, building relationships and research connections, and gaining access for students to start seeking access to databases or research librarians early in the process. They might also be good sources for expert advisers, oral defense panelists, and even venues for viewing or presenting student research.
- Encourage creative topics of study outside of the social sciences, especially in the humanities, arts, engineering, and technology, as the curriculum of AP Research is broad and comprehensive enough to accommodate work in varied disciplines. Remind students doing such projects that they need to be explicit about their method, approach, and process.

- Emphasize the importance of developing one precise, focused research question that is narrow enough to be studied within the scope of the project but broad enough to develop a new understanding. Doing so affects the rest of the research project, and thus is essential. Remind students that all elements of the research paper should relate to their research question and should speak back to their argument. Remind students to state their research question early and clearly to help the reader understand the direction and focus of the project.
- Emphasize revising the paper's introduction near the end of the research process, so as to clearly identify the question that guides the project and situates the question within a broader context. Remind students that introductions need to avoid broad generalizations and should also be informed by sources and evidence. Remind students that statements of fact or argument need to be cited, even in the introduction. Remind students that research yields new understanding incrementally, and credible researchers moderate their claims. This means that hyperbolic language regarding what they will do or what new understanding they have generated should be discouraged.
- Remind students that abstracts are useful organizational tools, but that they will not be scored as part of the paper. Have students verify that anything that appears in the abstract (if they choose to write one) also appears in the appropriate place in the body of the paper. Encourage students who want to write an abstract to do so after their research paper is complete, and to do so as a summary of the paper, so that no new information not already in the body of the paper shows up.
- Remind students to write as if the audience for the paper is an intelligent non-expert who does not know anything about this specific area. Remind students that as the author and researcher, it is their job to clearly convey what they did, why the approach they took is appropriate given the topic of inquiry, what they found, and what implications their conclusions have for our understanding of the question. It is not the reader's job to infer any of this from the paper; it is the student's job to be clear and explicit. Also remind students that there is no guarantee that their paper will be read and scored by an expert in that field, making it all the more important to write clearly and explicitly for an intelligent non-expert audience.
- Review what constitutes scholarly sources so as to use knowledge from AP Seminar to help scaffold work in AP Research.
- Show students examples of literature reviews from published works or from previous years' student papers to help them understand how researchers review the literature in a way that suggests a debate or illustrates a gap in our understanding.
- Explicitly teach how multiple perspectives are integrated in a research paper. Students should be able to recognize and acknowledge perspectives that do not align with their own initial assumptions on a topic. Teach students the technique of placing these perspectives in conversation through transitions that indicate agreement and opposition, exemplar and corroboration, or consequence or sequence. Have students practice explaining how various authors' ideas connect to one another, and to the argument that the student is developing in the paper.
- Have students think about a literature review as a conversation that they are listening in to and reporting back about. Emphasize that they should think about reporting back about that conversation by organizing that section by the arguments, ideas, or perspectives, rather than by authors.
- Help students consider database search strategies, as well as alternative database options. Spend time helping students conduct database searches and teach them that though they may not find articles that relate directly to their topic, they will find sources that relate closely to it. Consider encouraging them to access databases or to consult with research librarians at local institutions of higher education early in the process

- Remind students that they need to explain explicitly which research design, method of analysis, or approach they have chosen, how it will be carried out, and why it is the appropriate method to address the student’s research question. Remind students that they are completing the task as laid out in the CED, which means that the discussion of their methodology needs to be fairly detailed, even when it is generally understood within the field. A reader who is an intelligent non-expert should be able to easily understand that description and rationale and be able to reasonably replicate the approach.
- Help students understand that specific methods have specific requirements. For example, methods such as meta-analysis, content analysis, the Delphic method, hermeneutics grounded theory, qualitative comparative analysis, systematic review, correlational analysis, and historical analysis (or historiography) have particular guidelines and procedures that must be followed. Students are using these methods without clear explanation of what they have done, and without evidence of clear understanding of how to use these methods. Encourage students to read within their area to better understand appropriate methodology choices. Provide examples where possible, and close-read these samples to check for method explanation and alignment. Allow for time for in-depth lessons about different research methods (including modeling, building together, peer review).
- Given how frequently students are relying on survey methodology, teachers should devote class time to teaching about effective survey construction and implementation and should make sure students understand the purpose of utilizing survey research. Note that if students survey adjacent populations (e.g. classmates), it should be for defensible reasons, vis-a-vis the research project, and not simply for the sake of convenience. If surveying classmates or high school students does not represent a well-aligned method designed to answer the given research question fully, students should abandon this method for one that makes more sense.
- Students can be reminded that it’s never a bad idea to use a proven methodology from the literature (a survey instrument that has worked for others, for example). If the methodology is adjusted, the student should be encouraged to make the justification for the adjustment clear. How does the adjustment align with the research question?
- If students are using a methodology with which the teacher is unfamiliar, the teacher can recommend that the student find an outside expert who can review and comment on that approach. Teachers might also invite other instructors or use varying instructional materials into the classroom. For instance, teachers who do not feel comfortable using data could invite an AP Statistics teacher to work with students or could assign statistics videos for students to watch and later apply to their papers. Finally, finding exemplars of that type of method in published work or in previous student papers would be helpful to students.
- Encourage students to continue to engage in peer reviewing even while developing their methodologies. This might be made easier if students could create “method communities” in the classroom, where students with similar research methods can give each other feedback on their approach and communication of ideas and conclusions.
- Teachers need to spend more time prior to the research proposal discussing ethical and feasibility issues. There were a lot of papers that collected sensitive information without clear evidence of an IRB or some way to gain consent. Clearly message the need to address ethical issues proactively, fully, and appropriately, particularly when dealing with human or animal subjects. Remind students that it is their responsibility to act in an ethical manner in carrying out their study responsibly, and in presenting the data honestly and accurately. Even if students will not go through an IRB / human subjects review process, encourage them to reflect on ethical issues of their projects’ methodology or implications, as it is expected that they do so.
- Remind students that it is their responsibility to act in an ethical manner with regard to appropriate citation and attribution. Use Turnitin.com to ensure that students are complying with AP Research course guidelines regarding plagiarism.
- Emphasize the importance of starting to collect the evidence or data as early as possible in the year, so as to leave enough time to carry out the study, complete the analysis, and leave time to write up and revise the paper.

- Teachers should construct more activities on how to analyze data (for instance: how to use primary documents in historical analysis, or how to do content analysis, or descriptive statistics calculation).
- Teachers should encourage their students to think not just about how their paper fits a gap in the academic research, but also to conclude with an analysis on how the paper’s conclusion (drawn from evidence generated by the research method) contributes to the conversation. As one reader put it, a distinction between good and great papers is that in good ones “the author made an attempt to join the conversation yet didn’t bring anything truly new to the discussion. The author only showed that they belong at the table.”
- Teach students useful strategies for formatting and displaying data to readers. Review research papers that display data more and less effectively, and have students critique their use of design elements to convey this information.
- Encourage students to see the implications and conclusions sections of their papers as critical components that allow them to situate their study’s findings and help the findings to have meaning beyond their own study. The implication sections in weaker papers suggested that this step was an afterthought or an attempt to simply catalog possible sources of error, rather than an opportunity to address the “so what?” implications of their research or the opportunity to speak back to the professional discussion. Encourage students to reflect on and write about why their results are what they are; have them point out where their results matched previous research (and explain why this could have happened) and also where it did not (and explain why this could have happened). Remind students to situate their findings in the literature. In the conclusion, papers that referred back and compared the new findings to previous findings demonstrated an ability to show how their findings had meaning beyond their own study. That also helped to show the new understanding and its relevance.
- If students wish to use an appendix, remind them to discuss the most pertinent material or evidence in the body of the paper, and to explicitly reference (and direct the reader to) the Appendix in the main text of the paper.
- Make sure students know the writing style and citation style expected in their discipline. Spend time emphasizing proper and consistent citation techniques, including the need to cite works of art, images, tables, or figures used in the paper, and the need to cite fully all online sources (not just the URL/web address). Teach, model, discuss, and work with students throughout the year regarding the mechanics of citations.
- Do not allow or encourage students to upload responses that have been submitted for other courses at their school. This leads to a misalignment with the rubric used for AP Research. Sometimes these are incredible papers (literary analyses for instance) that just don’t align with the AP course description.
- Remind students that prior to their final submission they should proofread their work carefully. Remind students to remove their names, school names, teacher’s names, expert advisor names, and other identifying information from works submitted. Possibly give teachers the ability to redact that sensitive information before upload.
- Sometimes conversions from Google Docs or other formats to PDF results in some content being lost. Remind students to make certain that the PDF they are about to submit is absolutely their final paper, contains all of the desired text and elements, and is the version that they intend to be scored.

What resources would you recommend to teachers to better prepare their students for the content and skill(s) required on this question?

- Use the rubric as a teaching tool and a guide for the students throughout the course. Periodically have students review the rubric and ask themselves (perhaps in the PReP – Process and Reflection Portfolio) whether the elements of their Academic Paper have met the criteria in the rubric.
- Use the Student Workbook and associated PowerPoint presentations from the AP Research Teacher Community to help students focus their research questions, align their chosen method to the purpose of their inquiry, and to ensure they are addressing ethical research practices in writing and in the implementation of their method.

- Teachers should attempt to troubleshoot their curriculum on the AP Research Community, encouraging and engaging in dialogue that supports their own development of the course and course expectations, particularly after they receive their score report data.
- Teachers should also consider applying to be readers during the AP Research Summer Reading, as this professional development not only allows teachers to understand the rubric, but it provides access to student work that creates more context for the course and the various disciplines of scholarly research.
- Citations in many student papers were disorganized, missing sources, or formatted incorrectly. Effective use of free plug-ins or apps such as Zotero (<https://www.zotero.org/>) can help students organize their cited sources and cite them consistently and in the correct format.
- Purdue Owl (<http://owl.english.purdue.edu/owl>) is a great, free, on-line source on citation and reference formatting. It contains information on many widely-used citation styles and guidelines regarding best practices in source citation and attribution.
- Human Subjects / IRB training would be useful professional development for AP Research teachers but would also benefit AP Research students who will be engaging with people for their project. While there is an IRB education exemption for most high school students' projects (based on US Department of Health and Human Services guidelines), such training would help students to at least talk about the ethical issues involved in their study, which is still required. It also models better research practice, which would be required at the college or university level. One free option is the on-line Protecting Human Research Participants module, from the National Institutes of Health's (NIH) Office of Extramural Research, in pdf version at <https://phrp.nihtraining.com/files/PHRP.pdf>.
- Teachers should look into alternative journal collections such as JSTOR, or search engines such as Google Scholar, or consider a field trip to the local university library to use their resources. This way, students have a wealth of information outside of EBSCO. Teachers might consider building partnerships with local colleges or universities and their libraries as a way to provide more resources to students, but also as a way to introduce local institutions of higher education to the great work AP Research students are doing.
- Encourage students interested in historical research to look into digital archives and data sets. There is a wealth of letters, diaries, and artifacts from under-represented groups that has been digitized and made widely available. Students looking for an innovative topic should look to the work of digital historians and digital history projects to find data that has only been lightly explored.
- There are various quantitative database websites with online analysis built in to the platform (especially in the social sciences), such as Gapminder, Google Trends, Kaggle, the European Social Survey, GESIS, World Values Survey, or the General Social Survey. There are also numerous sources for aggregate public opinion data, such as the Pew Research Center, Roper iPoll, Gallup, and PollingReport.com. Free open source government and international organization data also exist at websites such as <http://www.data.gov>, <http://www.census.gov>, <https://data.worldbank.org>, <http://data.un.org>, and many others sources.

Students who want to conduct statistical analyses can use a free online tool called PSPP, which can be accessed at <http://www.gnu.org/software/pspp>. It is designed to be similar to SPSS, a commonly-used statistics software package, and is generally user-friendly.

- Professors at nearby colleges or universities could be resources in other ways; as expert advisors, as guest lecturers, or as oral defense panelists.

- If your local college or university holds an honors day or research symposium event where undergraduate students are presenting their research, consider finding out whether your class can attend (or even present their work). Students could see different kinds of research and hopefully observe good presentations. For students who are not thinking about going to college, seeing where their research could take them could be meaningful and encouraging.