ELEPHANT IN THE CLASSROOM: HOW ETHICAL AI CAN IMPROVE STUDENT SUCCESS

KOCAMAN, IBRAHIM, Embry-Riddle Aeronautical University
kocamani@earu.edu

CUTRER, DANIEL, Embry-Riddle Aeronautical University
cutre0b1@aera.edu

_____

ABSTRACT

The integration of artificial intelligence (AI) into teaching and learning in higher education without compromising academic integrity is a pressing issue. To make the benefits of generative AI (GenAI) available to students while upholding principles of ethics and academic honesty, the authors implemented an ethical use of AI policy in their *Introduction to Research Methods* at Embry-Riddle University. The authors hypothesized and found that allowing ethical utilization of AI would lead to higher student engagement and academic success. These findings offer valuable insights for higher education programs and educators, particularly in security studies.

Keywords: *generative AI, ethical use of AI, research methods, student engagement*

_____

College students' use of generative artificial intelligence (GenAI) challenges traditional measures of academic integrity, knowledge acquisition, and retention (Bauer et al., 2025; Holmes, 2020; Zawacki-Richter et al., 2019). The authors explored the utility of allowing college students to ethically use AI, addressing the question: *How can AI be integrated in higher education to increase student engagement and success without compromising academic integrity*? We hypothesized and found that ethical integration of AI into classroom practices results in higher student engagement and the production of high-quality research papers.

We tested our hypothesis by implementing an ethical AI policy in our department's *Introduction to Research Methods* (SS207) course. We crafted an ethical AI policy that allows students to utilize several AI tools, including *ChatGPT*, *NotebookLM*, *STORM*, and *Scite*, in both in-class and take-home assignments. We communicated this policy to our students and assessed its impact on student engagement and success using a two-group post-test-only quasi-experimental design. Our findings indicate that students who took the two sections of the *Introduction to Research Methods* course in which our ethical AI policy was implemented were more engaged and wrote better research papers than those who took the two sections of the course where it was not implemented.

SECURITY STUDIES AND INTERNATIONAL AFFAIRS DEPARTMENT, EMBRY-RIDDLE AERONAUTICAL UNIVERSITY

Embry-Riddle Aeronautical University (ERAU) has its main residential campus in Daytona Beach, Florida, a smaller campus in Prescott, Arizona, and an online worldwide campus, all of which are headquartered in Daytona Beach. In Fall 2024, the Daytona Beach campus enrolled 8,748 students, comprising 7,943 undergraduates and 805 graduates (ERAU, n.d.). ERAU is accredited at the Doctorate level (Level VI) by the Southern Association of Colleges and Schools, Commission on Colleges, Region 3: South, Division 5. The university is located in the South Atlantic census region.

The university hosts the Homeland Security & Intelligence (HSI) degree program within the Security Studies and International Affairs Department of the College of Arts & Sciences. The program was established in 2005 and is one of two bachelor's degrees offered in the department, alongside Global Conflict Studies. Eighteen full-time faculty members and eight adjuncts support the department, which has 293 students (ERAU, n.d.).

In January 2025, ERAU's Bachelor of Science in Homeland Security and Intelligence program was the first residential undergraduate homeland security program in the United States to earn accreditation from the Council for the Accreditation of Emergency Management and Homeland Security Education (CAEMHSE), which aims to advance and promote quality emergency management and homeland security disciplines in higher education through a rigorous evaluative process (CAEMHSE, n.d.) This prestigious accreditation, valid for 5 years, underscores the HSI program's academic excellence and innovative approach to homeland security education.

INTRODUCTION TO RESEARCH METHODS

We integrated our ethical AI policy into the *Introduction to Research Methods* course, which is a required course for both majors offered by our department: the B.S. in Homeland Security Intelligence and the B.S. in Global Conflict Studies. The objective of this course is to introduce students to the qualitative and quantitative research methods used in security studies and international affairs. Students develop their own empirical research questions, understand which research approaches are best for finding answers, learn to use a variety of tools and methods to conduct research, evaluate research by others, and understand the process of writing and research design. Student learning outcomes include the following:

1. Articulate differing approaches of research and writing in the field of security studies and international affairs.
2. Implement research skills related to qualitative and quantitative methods.
3. Apply different research methods to different research scenarios.
4. Identify ethical principles in research.
5. Communicate research results, decisions, or conclusions based on analysis and synthesis of evidence.

This course focuses on enhancing students' research skills. While there are no prerequisites for the course, it is open only to students majoring in the two majors our department offers, and it is required for both. The course was first delivered in Fall 2021 as a required course for our Global Conflict Studies majors only. It was modified to become a required course for the Homeland Security Intelligence majors in Fall 2023. It has been delivered as a face-to-face course since its first offering.

Our pedagogical intervention involved introducing an Ethical AI Utilization Policy (EAUP), communicating it through the course syllabus and Canvas (our learning management system), implementing the policy throughout the semester through in-class exercises and take-home assignments, and evaluating its impact using a quasi-experimental study design. One of the authors taught two sections of the course in Spring 2024 without the policy. These two sections constituted our control group. The same instructor delivered the course, implementing our ethical AI policy, to two different sections in Spring 2025, which formed our treatment group since they received the treatment of being subjected to the AI policy.

We hypothesized that our intervention (EAUP) would increase student engagement and improve academic success. ERAU's Center for Teaching and Learning Excellence (CTLE) conducted midterm feedback on student engagement in both semesters. We compared these midterm feedback results to test the impact of our AI policy on student engagement. In this course, students submit a research paper as their final course artifact, applying the research methods they have learned. We compared student grades for this research paper assignment across both semesters to assess the impact of our policy on student success, using the delivery of a successful research paper as the primary benchmark of student success in the course. Our AI policy was communicated through the course syllabus, as shown in Figure 1.

To implement our policy, we posted AI-generated podcasts (created using NotebookLM) on Canvas for each module to enhance student engagement with the course material. We allowed students to use ChatGPT during in-class live coding sessions and take-home assignments in *RStudio*, the statistical analysis software we teach and require for data analysis and visualization in the course. We encouraged students to seek ethical research assistance from GenAI tools to kick-start their research. We designed an in-class literature review exercise, in which students use two LLM tools (*Scite* and *STORM*) to identify scholarly sources for the literature review portion of their research papers. The instructions for this assignment are provided in Figure 2.

Figure 1. Ethical Use of AI Policy (SS207, Academic Integrity Section, SP 2025)

This course encourages the students to get *ethical research assistance* from several generative AI tools (ChatGPT, Scite, STORM, and NotebookLM) to help save some time and effort in their learning and research processes. Specific ways to ethically utilize these generative AI tools will be discussed and demonstrated in class. In practical terms, the following are some DOs/DON'Ts regarding Dr. Kocaman's ethical use of AI policy:

Don'ts

- You may get coding help from ChatGPT (or other LLM tools) while using RStudio, but you may not have LLM tools do the assignments for you.
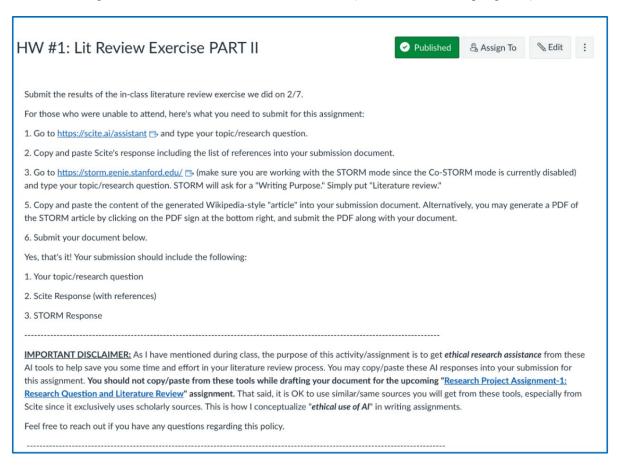- You may utilize several LLM tools (e.g., Scite and STORM) to kickstart your research process for your literature reviews. You may use the same/similar sources indicated by these tools while writing your literature review, but may not copy and paste from any LLM tool.

Do's

- Your research papers may not be generated by an LLM tool. I will use "less than 35%" as a benchmark for acceptable error margin on AI detection software. That said, this should not be understood as permission to have AI write 1/3 of your paper.
- You may use NotebookLM to better engage with the course material (my Deep Dive podcasts are generated by this tool) and to prepare for the exams, but you may not use it (or any other LLM tool) during the exams.

The bottom line is you may get assistance from AI tools in your learning and research process, but what you submit in your assignments/exams has to be your own work. This is how I conceptualize *"ethical use of AI"* in this course. When in doubt, make sure to reach out to me.

Figure 2. AI-Assisted Literature Review Exercise (SS207 Canvas Site, Spring 2025)

HW #1: Lit Review Exercise PART II

✅ Published   👥 Assign To   ✎ Edit   ⋮

Submit the results of the in-class literature review exercise we did on 2/7.

For those who were unable to attend, here's what you need to submit for this assignment:

1. Go to https://scite.ai/assistant ⬀ and type your topic/research question.

2. Copy and paste Scite's response including the list of references into your submission document.

3. Go to https://storm.genie.stanford.edu/ ⬀ (make sure you are working with the STORM mode since the Co-STORM mode is currently disabled) and type your topic/research question. STORM will ask for a "Writing Purpose." Simply put "Literature review."

5. Copy and paste the content of the generated Wikipedia-style "article" into your submission document. Alternatively, you may generate a PDF of the STORM article by clicking on the PDF sign at the bottom right, and submit the PDF along with your document.

6. Submit your document below.

Yes, that's it! Your submission should include the following:

1. Your topic/research question

2. Scite Response (with references)

3. STORM Response

IMPORTANT DISCLAIMER: As I have mentioned during class, the purpose of this activity/assignment is to get *ethical research assistance* from these AI tools to help save you some time and effort in your literature review process. You may copy/paste these AI responses into your submission for this assignment. **You should not copy/paste from these tools while drafting your document for the upcoming "Research Project Assignment-1: Research Question and Literature Review"** assignment. That said, it is OK to use similar/same sources you will get from these tools, especially from Scite since it exclusively uses scholarly sources. This is how I conceptualize *"ethical use of AI"* in writing assignments.

Feel free to reach out if you have any questions regarding this policy.

METHODOLOGY

Our study employs a quasi-experimental methodology, which shares many characteristics with experiments but lacks random assignment (Shadish et al., 2002), as the control and treatment groups were self-selected by the authors. Among the several types of quasi-experimental designs, we employed a two-group post-test-only design, which is the most straightforward and practical two-group design for Scholarship of Teaching and Learning (SoTL) studies (Bartsch, 2013). In our study, one group (students from two SS207 sections from Spring 2025) received the treatment (EAUP), while the other group (students from two SS207 sections from Spring 2024) did not. Both groups were evaluated using the same assessments. Our methodology aligns perfectly with the two-group post-test-only design. Similar designs are used in both physical (Deslauriers et al., 2011) and social science (Bridges et al., 1998) studies.

Ethical AI policy implementation is our independent variable, while we use two separate dependent variables for student engagement and success. Our first dependent variable, student engagement, was measured using two metrics ("INCLUDE" and "ENGAGE") from ERAU Center for Teaching and Learning's midterm feedback surveys. Our second dependent variable, student success, was measured by students' research paper grades. To test the impact of our pedagogical intervention (EAUP), we performed difference-in-means tests and regression analysis. We discuss our variables and statistical analysis results in greater detail in the following section.

COURSE ASSESSMENT

We present the assessment results from our implementation in this section. The overall performance of the course was assessed via periodic program assessments, classroom observations by senior faculty, midterm feedback surveys, material reviews, and end-of-semester student course evaluations.

In accordance with our two-group post-test only quasi-experimental design, we used the midterm feedback surveys to assess the impact of our pedagogical intervention on student engagement. The ERAU Center for Teaching and Learning Excellence administered the midterm feedback surveys in both semesters, utilizing Barbeau and Happel's (2023) Critical Teaching Behavior framework. We used the INCLUDE and ENGAGE indicators (both ordinal measures ranging from 0 to 5) from CTLE's survey to gauge student engagement in the control group (Spring 2024) and the treatment group (Spring 2025). The results from the difference in means tests for both INCLUDE and ENGAGE indicators show that our EAUP led to higher student engagement (0.54-point increase in INCLUDE and 0.55-point increase in ENGAGE). The differences in means for both indicators were statistically significant ($p = 0.006$ for INCLUDE and $p = 0.011$ for ENGAGE).

To test the impact of our AI policy on student success, we performed a regression analysis using student research paper grades from both semesters as the dependent variable, since these grades served as our success criterion. Our independent variable was whether the student received the

treatment under our ethical AI use policy, coded as "1" for students from Spring 2025 and "0" for students from Spring 2024. We also used student exam grades as a control variable, as it is reasonable to assume that students with higher exam grades would also write better research papers. Regression results indicate that EAUP implementation is associated with, on average, a 9.4-point increase in student research paper grades (p-value: 3×10^{-6}) when student exam scores are controlled for. The full results of the regression analysis are presented in Table 1.

Table 1. Regression Results: Impact of EAUP on Student Grades

	Dependent variable: Student Success					
	Research paper grade (1)	Exam score (2)	Logged paper grade (3)	Logged exam score (4)	Research paper grade (5)	Logged paper grade (6)
EAUP	9.606*** (1.881)	0.572 (1.108)	0.117*** (0.024)	0.007 (0.012)	9.438*** (1.865)	0.115*** (0.023)
Exam score					0.271* (0.155)	
Logged exam score						0.276 (0.172)
Constant	83.328*** (1.244)	93.828*** (0.773)	4.413*** (0.016)	4.539*** (0.009)	57.868*** (14.627)	3.160*** (0.783)
Observations	103	113	103	113	103	103
R^2	0.205	0.002	0.197	0.003	0.229	0.217
Adjusted R^2	0.197	-0.007	0.189	-0.006	0.213	0.202
Residual Std. Error	9.471 (df = 101)	5.889 (df = 111)	0.118 (df = 101)	0.066 (df = 111)	9.376 (df = 100)	0.117 (df = 100)
F Statistic	26.066*** (df = 1; 101)	0.267 (df = 1; 111)	24.845*** (df = 1; 101)	0.321 (df = 1; 111)	14.824*** (df = 2; 100)	13.896*** (df = 2; 100)
Note:						*p<0.1; **p<0.05; ***p<0.01

FUTURE PLANS

Based on the encouraging results, we plan to implement our EAUP for future offerings of the *Introduction to Research Methods* course and to expand its implementation to our *Introduction to Homeland Security* course, which is a required course for our Homeland Security Intelligence majors and minors. In future iterations, we will monitor student engagement and success indicators and fine-tune the delivery of our courses to adjust the integration of AI into our teaching as necessary. We submitted proposals to present the findings from our expanded implementation at several SoTL conferences. We also hope to publish our new findings in SoTL journals. One of the authors has recently received internal funding for a proposal that envisages broader institutional adoption of ethical AI policies. In Fall 2025, ERAU initiated an effort to harmonize the integration of AI into classroom practices across all colleges and programs.

CONCLUSION

This article presents an innovative solution that integrates GenAI into teaching research methods to students of Security Studies and International Affairs at Embry-Riddle Aeronautical

University's Daytona Beach campus. We developed an ethical AI policy tailored to address the goals and learning objectives of our *Introduction to Research Methods* course. We anticipated that implementing our ethical AI policy would enhance both student engagement with the course material and student success in the course. We tested our expectations using survey results on student engagement and grades from student research papers, using a simple treatment/control-group design. Our findings suggest that implementing an ethical AI utilization policy is associated with increased student engagement and academic success. While we plan to expand the implementation of our ethical use of AI policy to other courses within our program, we believe our findings may constitute a step in the right direction in terms of addressing the pressing issue of integrating the benefits of GenAI into higher education while minimizing its adverse impacts on learning and academic integrity.

REFERENCES

Barbeau, L., & Happel, C. C. (2023). *Critical teaching behaviors: Defining, documenting, and discussing good teaching* (1st ed.). Routledge.

Bartsch, R. A. (2013). Designing SoTL studies—Part II: Practicality. *New Directions for Teaching & Learning*, 136. https://doi.org/10.1002/tl.20074

Bauer, E., Greiff, S., Graesser, A. C., Scheiter, K., & Sailer, M. (2025). Looking beyond the hype: Understanding the effects of AI on learning. *Educational Psychology Review*, *37*(2). https://doi.org/10.1007/s10648-025-10020-8

Bridges, G. S., Gillmore, G. M., Pershing, J. L., & Bates, K. A. (1998). Teaching quantitative research methods: A quasi-experimental analysis. *Teaching Sociology*, *26*(1), 14–28. https://doi.org/10.2307/1318676

Council for the Accreditation of Emergency Management and Homeland Security Education (n.d.). *What accreditation is*. https://www.caemhse.education/accreditation

Deslauriers, L., Schelew, E., & Wieman, C. (2011). Improved learning in a large-enrollment physics class. *Science*, *332*(6031), 862–864. https://doi.org/10.1126/science.1201783

Embry-Riddle Aeronautical University (n.d.). *Enrollment*. https://news.erau.edu/media-resources/facts-and-figures/enrollment

Holmes, W. (2020). Artificial intelligence in education. In A. Tatnall (Ed.), *Encyclopedia of Education and Information Technologies*. Springer, Cham. Https://10.1007/978-3-030-10576-1_107

Shadish, W., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. Houghton Mifflin Company

Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education – where are the educators? *International Journal of Educational Technology in Higher Education*, *16*(1), 1–27. Https://doi.org/10.1186/s41239-019-0171-0