EPIC-DS Post

Survey Flow

EmbeddedData

- ah_firstValue will be set from Panel or URL.
- ah_lastValue will be set from Panel or URL.
- ah_idValue will be set from Panel or URL.
- institutionValue will be set from Panel or URL.
- departmentValue will be set from Panel or URL.
- course_nameValue will be set from Panel or URL.
- course_descrValue will be set from Panel or URL.
- course_prefix_numValue will be set from Panel or URL.
- termValue will be set from Panel or URL.
- term_startValue will be set from Panel or URL.
- term_endValue will be set from Panel or URL.
- sec_desc_1Value will be set from Panel or URL.
- sec_desc_2Value will be set from Panel or URL.
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- sec_id_1Value will be set from Panel or URL.
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sec_id_9Value will be set from Panel or URL.
sec_id_10Value will be set from Panel or URL.

Standard: required_masder_consent (1 Question)
Standard: optional_consent (1 Question)
Standard: required_course_section_info (4 Questions)
Standard: required_section_items (8 Questions)
Standard: optional_f_impact (20 Questions)
Block: required_ds_pedagogy (1 Question)
Standard: required_tsr (1 Question)
Standard: required_constraints_assignments (8 Questions)
Standard: required_conclusion (1 Question)
Standard: optional_add_questions (0 Questions)

Page Break

Start of Block: required_masder_consent

consent **Environment, Pedagogy, Institution, Course Inventory for Data Science Post-Course Inventory Title of research study:** Developing Validated Instruments to Measure Student/Faculty Attitudes in Undergraduate Statistics and Data Science Education **IRB #:** IRB-FY2025-79 **Investigator:** Michael A. Posner, Professor of Statistics and Data Science, michael.posner@villanova.edu, 610-519-3016 **Key Information:** This study involves research and is voluntary. You can stop at any time without penalty. **Purpose of the Research:** We are gathering data on attitudes toward data science. We are interested in (1) what these attitudes are, and (2) how attitudes relate to student and instructor characteristics and classroom environment. The following inventory asks about the learning environment, pedagogical practices, and other course characteristics. **Procedures:** The entire survey should take about 20 minutes to complete. We request that you complete every item, but you are not required to do so. Your survey responses may be linked with other data collected as a part of this study. You have been asked to give us your name and email address. The purpose is to verify your participation in this study, and to link your survey responses with any other responses you complete as part of this project. The EPIC inventory is administered in a pre-course and post-course format which we will link together. A dataset that excludes all personal identifying information will be made publicly available for educational researchers. The study investigator may grant access to approved researchers to use identifiable data for validated studies after a Data Use Agreement has been signed. **Risks / Discomforts:** This study is educational research and does not have any known associated risks. **Benefits to Prospective Subjects and/or to Others:** By filling out this survey, you may gain deeper insights into your pedagogical practices. Your responses may also aid data science education researchers in improving instruction in data science courses. For Villanova-specific resources and other mental health resources, visit the Villanova IRB website. To view these online, navigate to irb.villanova.edu and click “Participating in a Research Study.” As a participant in research, you have rights. Visit the Villanova IRB website to read the Participant Bill of Rights. To read online, navigate to irb.villanova.edu and click “Participating in a Research Study.” **Consent will be given**

through clicking “I accept” on Qualtrics surveys, by selecting one of the following options: I have read and understand the terms and conditions of this research study and agree to participate. I understand my participation is voluntary and that I may withdraw at any time without penalty. By clicking "yes" I am indicating my permission to participate in this study.

- ○ Yes: I agree to participate. (1)
- ○ No: I do not agree to particiapte. (2)

End of Block: required_masder_consent

Start of Block: optional_consent

instructor_consent Click to write the question text

- ○ Click to write Choice 1 (1)
- ○ Click to write Choice 2 (2)

End of Block: optional_consent

Start of Block: required_course_section_info

course_reminder **You are filling out the EPIC-DS post-survey for ${e://Field/CourseName} (${e://Field/CoursePrefixNum}) .**

instructor_first Instructor first name.

_____

_____

_____

_____

_____

instructor_last Instructor last name

_____

_____

_____

_____

_____

Q3 Indicate which section(s) of **${e://Field/CourseName}** you are currently teaching. Select all that apply.

☐ Section ${e://Field/Sec_Num1}: ${e://Field/Desc_Sec1} (1)

Display this choice:

If Sec_Num2 Is Not Empty

☐ Section ${e://Field/Sec_Num2}: ${e://Field/Desc_Sec2} (4)

Display this choice:

If Sec_Num3 Is Not Empty

☐ Section ${e://Field/Sec_Num3}: ${e://Field/Desc_Sec3} (2)

Display this choice:

If Sec_Num4 Is Not Empty

☐ Section ${e://Field/Sec_Num4}: ${e://Field/Desc_Sec4} (6)

Display this choice:

If Sec_Num5 Is Not Empty

☐ Section ${e://Field/Sec_Num5}: ${e://Field/Desc_Sec5} (7)

Display this choice:

If Sec_Num6 Is Not Empty

☐ Section ${e://Field/Sec_Num6}: ${e://Field/Desc_Sec6} (8)

Display this choice:

If Sec_Num7 Is Not Empty

☐ Section ${e://Field/Sec_Num7}: ${e://Field/Desc_Sec7} (9)

Display this choice:

If Sec_Num8 Is Not Empty

☐ Section ${e://Field/Sec_Num8}: ${e://Field/Desc_Sec8} (10)

Display this choice:

If Sec_Num9 Is Not Empty

☐ Section ${e://Field/Sec_Num9}: ${e://Field/Desc_Sec9} (11)

Display this choice:

If Sec_Num10 Is Not Empty

☐ Section ${e://Field/Sec_Num10}: ${e://Field/Desc_Sec10} (12)

End of Block: required_course_section_info

Start of Block: required_section_items

section_intro Please answer the following questions based on the **${lm://Field/1}** section of your course.

classsize_post How many students were enrolled in this class when students were asked to complete the post S-SOMADS? (This value will be used to calculate response rate.)

_____

live_meet Did your course have live meetings?

- Yes, the class had in-person meetings. (1)
- Yes, the class had online synchronous meetings. (2)
- Yes, the class had both in person and online synchronous meetings. (3)
- No, this class did not have live meetings (it was only asynchronous). (4)

Display this question:

If Loop current: live_meet != No, this class did not have live meetings (it was only asynchronous).

tsr_class My students feel comfortable asking me questions during class.

- Strongly Disagree (1)
- Disagree (2)
- Somewhat Disagree (3)
- Neither Agree Nor Disagree (4)
- Somewhat Agree (5)
- Agree (6)
- Strongly Agree (7)

Display this question:

If Loop current: live_meet != No, this class did not have live meetings (it was only asynchronous).

resource_live Which of the following describes the *primary* resource that you intend for students to use for learning?

- ○ Live, instructor-led lectures (1)
- ○ Pre-recorded videos created by the instructor (me) (2)
- ○ Pre-recorded videos created by another instructor (3)
- ○ Pre-recorded videos created by the textbook publisher (4)
- ○ Textbook (5)
- ○ Other (6) _____

Display this question:

If Loop current: live_meet = No, this class did not have live meetings (it was only asynchronous).

resource_notlive Which of the following describes the primary resource that you intend for students to use for learning?

- ○ Pre-recorded videos created by the instructor (me) (2)
- ○ Pre-recorded videos created by another instructor (3)
- ○ Pre-recorded videos created by the textbook publisher (4)
- ○ Textbook (5)
- ○ Other (6) _____

Display this question:

If Loop current: live_meet = Yes, the class had in-person meetings.

Or Loop current: live_meet = Yes, the class had both in person and online synchronous meetings.

classroom For each of the following items, please indicate the extent to which you agree with the statement about your physical classroom environment.

	Stongly Disagree (2)	Disagree (3)	Somewhat Disagree (4)	Neither Agree Nor Disagree (0)	Somewhat Agree (1)	Agree (5)	Stongly Agree (6)
Seating areas are arranged so students can interact and participate in classroom activities. (classroom_seating)	○	○	○	○	○	○	○
Furniture is, or can be, arranged to allow for the instructor to maneuver between students. (classroom_furniture)	○	○	○	○	○	○	○
There is a technology display method such as a smartboard or a projector. (classroom_technology)	○	○	○	○	○	○	○
There is a method to communicate information such as a chalkboard or whiteboard. (classroom_board)	○	○	○	○	○	○	○

All comfort elements of my classroom (such as lighting, temperature, and ambient noise level) are appropriate. (classroom_comfort)	○	○	○	○	○	○	○
The number of students in the classroom makes it challenging to interact with the students. (classroom_numstud)	○	○	○	○	○	○	○

Display this question:

If Loop current: live_meet = Yes, the class had in-person meetings.

Or Loop current: live_meet = Yes, the class had both in person and online synchronous meetings.

classroom_comments If you have any additional comments about the physical classroom, please provide them in the space below.

_____

_____

_____

_____

_____

End of Block: required_section_items

Start of Block: optional_f_impact

f_instructions The questions on this page are from the Faculty Inventory of Methods and Practices Associated with Competent Teaching (F-IMPACT). The F-IMPACT is a modification of the Teaching Practices Inventory (TPI) to be valid for both face-to-face and online course modalities by a team led by Chistopher Moore at University of Nebraska, Omaha. (https://www.unomaha.edu/academic-affairs/stem-trail-center/research/impact.php)

support_course **I. Course Information and Supporting Materials** Check all of the course information that you provided to students via hard copy or a course web page.

- ☐ List of topics to be covered (1)
- ☐ List of topic-specific competencies (skills, expertise, …) students should achieve (what students should be able to do) (2)
- ☐ List of competencies that are not topic related (critical thinking, problem solving, …) (3)
- ☐ Affective goals – changing students' attitudes and beliefs (interest, motivation, relevant beliefs about their competencies, how to master the material) (4)
- ☐ None of these (5)
- ☐ Other (please specify) (6)

_____

material_course Check all of the supporting materials that you provided to students in this course.

- [ ] Student wikis or discussion boards with little or no contribution from you (1)
- [ ] Student wikis or discussion boards with significant contribution from you or a teaching assistant (undergraduate or graduate) (2)
- [ ] Solutions to homework assignments (3)
- [ ] Worked examples (text, pencast, or other format) (4)
- [ ] Practice exams, or previous year's exams (5)
- [ ] Videos, animations, or simulations related to course materials (6)
- [ ] Lecture notes or course PowerPoint presentations (partial/skeletal or complete) (7)
- [ ] Articles from related academic literature (8)
- [ ] Examples of exemplary papers, projects, or other assignments (9)
- [ ] Grading rubrics for papers, problem solutions, or large projects (10)
- [ ] None of these (11)

- [ ] Other (please specify) (12) _____

assignments **II. Assignments and Exams** Check all that applied to assignments in this course.

- [ ] Homework was assigned or suggested, but did not contribute to course grade (1)
- [ ] Homework was assigned and contributed to course grade (2)
- [ ] Paper or project (an assignment taking longer than two weeks and involving some degree of student control in choice of topic or design) (3)
- [ ] Students encouraged to work collaboratively on their assignments (4)
- [ ] Explicit group assignments (5)
- [ ] Student presentations (verbal or poster, either live or through video) (6)
- [ ] None of these (7)
- [ ] Other (please specify) (8) _____

num_assignments How many tests or major assignments were assigned during the term (e.g. midterm exams, papers, projects)?

- 0 (1)
- 1 (2)
- 2 (3)
- 3+ (3)

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reasoning_pct What was the approximate fraction of test questions or major assignment criteria that required students to explain their reasoning?

- 0-5% (1)
- 6-10% (2)
- 11-15% (3)
- 16-25% (4)
- 25+% (5)

final_pct What percentage did a final exam, paper, or project contribute to the total course grade?

- ○ 70% or greater (1)
- ○ 61-69% (2)
- ○ 51-60% (3)
- ○ 41-50% (4)
- ○ 31-40% (5)
- ○ 30% or less (6)
- ○ No final exam, paper, or project (7)

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feedback_freq **III. Feedback** How often did you explicitly solicit feedback about the course from students during the term?

- ○ Not including end of term course evaluations, student feedback about the course was not requested during the term. (1)
- ○ One midterm course evaluation asking for student feedback about the course (2)
- ○ Repeated student feedback about the course requested (more than once) (3)

type_feedback Check all of the following feedback provided by you to students during the term.

- [ ] Assignments with feedback from instructor, teaching assistant, or peer before grading or with opportunity to redo work to improve grade (1)
- [ ] Assignments graded within 1 week after student submission (2)
- [ ] Students see graded assignments (3)
- [ ] Students see assignment answer key and/or grading rubric (4)
- [ ] Students see their graded midterm exam(s)/quizzes, papers, or projects (5)
- [ ] Students see midterm exam(s)/quizzes answer key(s) and/or grading rubric(s) (6)
- [ ] Students explicitly encouraged to meet individually with you (7)
- [ ] None of these (8)
- [ ] Other (please specify) (9) _____

question_freq **IV. Instructional Features and Activities** Per week, how many times did you ask for questions (in lectures, embedded prompts in videos/readings, posted discussion boards, or through other means)?

- 0 (1)
- 1-2 (2)
- 3-4 (3)
- 5+ (4)

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discussion_freq Per week, how many times did you have group student-student discussions or problem solving (includes online discussion boards)?

- 0 (1)
- 1 (2)
- 2 (3)
- 3+ (4)

useful_freq Per term, how many times did you have discussions on why the material is useful and/or interesting from students' perspective?

- 0-2 (1)
- 3-5 (2)
- 6-9 (3)
- 9+ (4)

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concept_pct Considering the time spent on the major topics, approximately what fraction was spent on the process by which the theory/model/concept was developed, including the methods and results that support specific theories or ideas?

- 0-10% (1)
- 11-25% (2)
- more than 25% (3)

listening_pct What fraction of a typical class or online equivalent did students spend listening to lectures directly or through video (presentation of content, derivation of results/solutions, etc.)?

- ○ 0-20% (1)
- ○ 20-40% (2)
- ○ 40-60% (3)
- ○ 60-80% (4)
- ○ 80-100% (5)

type_response A student response method is any means used to collect responses from all students in real time either during class (e.g. clickers, online polls, online chat) or embedded in the middle of readings or videos. Check all that occurred in your course.

- [ ] More than one student response question is posed per class or online equivalent, not counted towards the course grade (1)
- [ ] More than one student response question is posed per class or online equivalent, counted towards the course grade (2)
- [ ] More than one student response question is posed per class or online equivalent, followed by student-student discussion (synchronous or asynchronous, such as via online discussion boards) (3)
- [ ] None of these (4)
- [ ] Other (please specify) (5) _____

meta_cognition Check all that typically occurred both before and after class or online equivalent.

- [ ] Students asked to read/view material for upcoming class or online equivalent (1)
- [ ] Students read/view material on upcoming class or online equivalent and complete assignments or quizzes on it shortly before the beginning of the class or online equivalent (2)
- [ ] Reflective activity at end of class or online equivalent (students briefly answering questions, reflecting on lecture and/or their learning, etc.) (3)
- [ ] None of these (4)
- [ ] Other (please specify) (5) _____

assessment_type **V. Course Assessment and Innovation** Check all that occured in your course.

- ☐ Assessment given at beginning of course to assess background knowledge (1)
- ☐ Use of instructor-independent pre-post test (e.g. concept inventory) to measure learning (2)
- ☐ Use of pre-post test that is repeated in multiple offerings of the course to measure and compare learning (3)
- ☐ Use of pre-post survey of student interest and/or perceptions about the subject (4)
- ☐ Opportunities for students' self-evaluation of learning (5)
- ☐ Students provided with opportunities to have some control over their learning, such as choice of topics for course, paper, or project, choice of assessment methods, etc. (6)
- ☐ New teaching methods or materials were tried along with measurements to determine their impact on student learning (7)
- ☐ None of these (8)
- ☐ Other (please specify) (9)

_____

collaboration_freq **VI. Collaboration and Sharing in Teaching** How often do you discuss how to teach this course with colleague(s)?

- Never (1)
- Sometimes (2)
- Often (3)

lit_freq How often do you read literature about teaching and learning relevant to this course?

- Never (1)
- Sometimes (2)
- Often (3)

observation_freq How often do you observe a colleague's class (any class) to get/share ideas for teaching?

- ○ Never (1)
- ○ Sometimes (2)
- ○ Often (3)

End of Block: optional_f_impact

Start of Block: required_ds_pedagogy

extent For each item below, indicate the extent to which you do this in your course.

	Not implemented (1)	Minimally implemented (2)	Mostly implemented (3)	Fully implemented (4)
Teach statistics as an investigative process of problem-solving and decision making. (extent_investugative)	○	○	○	○
Incorporate multivariable thinking (e.g., confounding, visualization with more than two variables, multiple regression, etc.). (extent_multivariable)	○	○	○	○
Focus on conceptual understanding of core concepts. (extent_conceptual)	○	○	○	○
Use primarily real data. (extent_realdata)	○	○	○	○
Teach students to understand context in which data was gathered before making interpretations. (extent_datasource)	○	○	○	○

Cultivate active learning (activities, group work, discussion, etc.). (extent_activelearning)	○	○	○	○
Teach using the flipped or inverted classroom structure (i.e., students spend class time applying material first encountered before class). (extent_flipped)	○	○	○	○
Regularly address ethical issues related to data science practice and data collection. (extent_ethics)	○	○	○	○
Assign project(s) as an integral part of learning. (extent_projects)	○	○	○	○
Obtain immediate student feedback using personal response systems (e.g., clickers, polling software, ABCD cards, etc.) whenever possible. (extent_clickers)	○	○	○	○

Use games and/or fun (songs, tricks, art, puzzles, jokes, etc.) to engage students. (Extent_Fun)	○	○	○	○
Use variety of assessments to measure student learning. (Extent_Assessment)	○	○	○	○
Incorporate scenarios that address diversity, equity, and/or inclusion throughout the course. (Extent_DEI)	○	○	○	○
Students spend time live coding during class. (Extent_24)	○	○	○	○
Instructor spends time live coding during class. (Extent_25)	○	○	○	○

End of Block: required_ds_pedagogy

Start of Block: required_tsr

tsr_grid Indicate the amount to which you agree with each statement.

	Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Neither disagree nor agree (4)	Somewhat Agree (5)	Agree (6)	Strongly Agree (7)
My students feel comfortable contacting me with questions outside of class. (tsr_outside)	○	○	○	○	○	○	○
I place a high priority on students knowing that I care about them. (tsr_care)	○	○	○	○	○	○	○
All interactions I have with my students are positive. (tsr_interact)	○	○	○	○	○	○	○
I know my students individually. (tsr_individual)	○	○	○	○	○	○	○
I know the names of all or most of my students in this class. (tsr_names)	○	○	○	○	○	○	○

I have high expectations for my students. (tsr_expectations)	○	○	○	○	○	○	○
I intentionally create opportunities for students to build community in class. (tsr_communtiy)	○	○	○	○	○	○	○

End of Block: required_tsr

Start of Block: required_constraints_assignments

constraints Identify any **constraints** that keep you from making changes that you would like to implement to improve your course. Select all that apply.

- [ ] Your personal time constraints or priorities (1)
- [ ] Your professional time constraints or priorities (2)
- [ ] Mandated curriculum or coordinated course (3)
- [ ] Format or modality of the course (4)
- [ ] Required textbook (5)
- [ ] Class size typically too small (6)
- [ ] Class size typically too large (7)
- [ ] The teaching assistants with whom you work (8)
- [ ] Technology constraints in classroom (e.g., lack of computer lab, cost of software) (9)
- [ ] Financial constraints for the students (e.g., cost or access of technology and/or materials) (10)
- [ ] Institutional/Departmental values placed on teaching (11)

- [ ] Characteristics of students (e.g., preparedness, interest) (12)
- [ ] Physical characteristics of some classrooms (e.g., lack of flexible seating) (13)
- [ ] Other constraints (14)

_____

lms This question is about how you deliver your assignments. Excluding exams, how do you assign assessments (quizzes, homework assignments, labs, etc.)? Please select all that apply.

- [ ] I do not give assessment. (0)
- [ ] I use a university-sponsored learning management system (LMS) such as CANVAS, Moodle, Blackboard, etc. (1)
- [ ] I use publisher's LMS such as MyStatLab (Pearson), WebAssign (Cengage), etc. (2)
- [ ] I use publicly-available LMS, such as, MyOpenMath, WeBWorK, etc. (3)
- [ ] I do not use an LMS for assignments. (For example, assignments on paper or PDFs given to the student.) (4)
- [ ] I use a grading tool to collect and grade assignments, such as Gradescope. (5)
- [ ] I hand out assessments on paper and students complete work on paper. (6)
- [ ] Other, please describe. (7) _____

assignments Identify the types of student learning assessments typically used in this class. Please select all that apply. Some assessments may satisfy multiple items (e.g., a project where students also present).

- ☐ Exams (1)
- ☐ Quizzes (2)
- ☐ Projects (individual or group) (3)
- ☐ Presentations (individual or group) (4)
- ☐ In-class activities (5)
- ☐ Papers or reports (6)
- ☐ Discussion boards (7)
- ☐ Other (8) _____

Skip To: End of Block If assignments != Exams

*

num_exams How many exams (including the final exam) are given in this class?

_____

X→

who_proctor Who is proctoring (whether remotely or in person) the exams?

- Instructors and/or teaching assistants (1)
- Proctoring or testing center (2)
- An AI-based proctoring tool such as ExamRoom.AI, ProctorEdu, etc. (3)
- No one. Students take exams without a proctor. (4)

X→

where_take Where do students take the exams?

- In a classroom (1)
- In a proctoring or testing center (2)
- In a location of their choice but they must turn on their computer camera (3)
- In a location of their choice (4)

exams_admin What is the format in which the exams are administered?

- On paper (includes using software to perform calculation) (1)
- Online with software that restricts web browsing (3)
- Online without restrictive software (2)
- Orally (4)
- A combination of formats (5)

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quest_type Broadly speaking, what types of questions are on the exams?

- All or almost all multiple choice questions (1)
- Some multiple choice and some open-ended questions (2)
- All or almost all open-ended questions (3)

End of Block: required_constraints_assignments

Start of Block: required_conclusion

coursecomment_post Are there any important aspects of this course which have not been captured above? (For example, an honors section, non-standard assessment, modality change mid-course, etc.)

_____

_____

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_____

_____

End of Block: required_conclusion

Start of Block: optional_add_questions