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Teaching methods and materials in undergraduate economics courses: School, instructor, and department effects

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ABSTRACT

There has been very little change in how the economics profession teaches undergraduate students over the last 25 years. This study examines the effects of school, instructor, and departmental characteristics on teaching methods and materials used in undergraduate economics courses. We employ the regression framework originally used by Harter, Schaur, and Watts (2015a), but differentiate our work from prior research by using a single survey sample, separating descriptive statistics by course type, adding new dependent variables (e.g., use of adaptive learning technologies), and creating figures to represent predicted probabilities for a variety of variables. We find, among other things, that changes in departmental policies, such as teaching loads and class sizes, along with shifts in the composition and characteristics of faculty members (e.g., male vs. female or years of teaching experience) may have unintended consequences on instructors' teaching practices. These findings have implications for school and departmental policies that could affect the quality of undergraduate economics course instruction.

1. Introduction

In 1995, Becker and Watts began conducting a quinquennial survey on teaching and assessment methods in undergraduate economics courses (Becker and Watts, 1996; Becker and Watts, 2001; Watts and Becker, 2008; Watts and Schaur, 2011). A staple finding of this longitudinal effort has been the continued use of "chalk and talk" as the preferred method of instruction across the undergraduate economics curriculum (Asarta et al., 2021). As shown by Harter et al. (2015a), "the choice of teaching methods and materials is affected by key school, departmental, and faculty characteristics" (p. 1169). In fact, using data from four separate quinquennial surveys (1995, 2000, 2005, and 2010), these authors find faculty characteristics, including instructor sex, level of experience, and having English as a second language affect faculty members' selection of instructional strategies. Moreover, their research finds significant differences in undergraduate economics teaching methods and materials based on school Carnegie classifications and departmental

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characteristics, such as teaching load and class size. This current study uses the 2020 quinquennial survey data to investigate characteristics that affect these choices as the landscape of higher education and societal infrastructure has changed.[1]

Advancements in instructional technologies, such as web-based textbooks, online economic databases, and adaptive learning systems, have provided instructors with access to new instructional materials (Asarta et al., 2021; Harter and Asarta, 2022). Moreover, changes in school and departmental policies resulting from rapid technological progress (Schimanski and Alperin, 2018), reductions in state budget allocations for higher education (Blankenberger and Williams, 2020), and shifts in faculty composition as tenure-track faculty retire and are replaced with younger faculty cohorts that are more diverse (McChesney and Bichsel, 2020) have affected university environments and influenced instructors' pedagogies. Even with all these changes, economics instructors still lack variation in teaching methods (Sheridan and Smith, 2020). Therefore, this study uses data from the sixth national "chalk-and-talk" survey, following the procedures and methodology of Harter et al. (2015a), to assess factors affecting the choice of teaching methods and materials in undergraduate economics courses in the time period just before the COVID-19 pandemic abruptly impacted the world. And, once the seventh quinquennial survey is distributed in 2025, this study will serve as the critical baseline measure needed to assess the "before" and "after" consequences of the COVID-19 pandemic on teaching methods and materials in undergraduate economics courses.

2. Survey background

The quinquennial survey on teaching and assessment methods in undergraduate economics began in 1995 and has been repeated every five years. Although the survey samples for each administration were drawn from different lists of academic economists due to changes in list availability, each time, the authors attempted to survey the most comprehensive list available. The survey was originally administered through the mail, using a fixed-interval sampling of the mailing list. In 2010, an option to respond online was added and, in 2020, the survey was offered online only. The survey questions changed little over the years, and the response rate declined from 21% in 1995 to 10.5% in 2010. The results have revealed few changes in teaching methods over time, with "chalk and talk" persisting as the most prevailing instructional method in economics.[2] Goffe and Kauper (2014) find that economics instructors tend to use "chalk and talk" heavily because they either believe that lecturing is the best pedagogical method for teaching economics or find lecturing to be a cost-effective way to teach.

The quinquennial survey was most recently distributed at the beginning of 2020 and was closed in early March when it became apparent faculty would experience changes in teaching conditions due to the COVID-19 global pandemic. The 2020 response rate was 14.4%. Since the methodology for the quinquennial surveys has always used voluntary, self-reported data, respondents may not be representative of all undergraduate economics instructors in the United States. Individuals who have more interest in using diverse teaching methods may have been more likely to respond to the survey. In addition, instructors who received the email survey invitation may have been aware of the results from previous surveys suggesting little change in the instructional methods used by undergraduate economics course instructors, making some people less inclined to respond to the survey. Even so, the absolute number of surveys returned in 2020 was three times greater than the number returned in 2010, likely due to the online survey distribution.

In 2020, instructors were asked to respond to the same questions about instructional methods and materials for each type of course they taught, including principles and survey, intermediate theory, other upper-division field, and statistics and econometrics courses. The 2020 survey also included an expanded 0 – 6 integer response, which allowed for more granularity but can also be mapped to the 0 – 4 scale used in surveys from previous years. Using the 0 – 6 scale reveals a little more variation in teaching methods but not any significant changes when compared to the 0 – 4 scale.[3] For consistency with earlier studies, we use the prior survey coding of 0 – 4 in this paper.[4]

3. Data and descriptive statistics

Table 1 presents the definitions for the independent variables used in this study, including the instructor characteristics as well as

[1] The first two reports of basic teaching method findings from the sixth administration of this national survey in 2020 show a notable increase in the use of "student(s) with student(s)" discussions since 1995 (Asarta et al., 2021; Harter and Asarta, 2022). Additionally, those reports find that references, activities, and lessons addressing diversity, inclusion, or gender issues are almost never used in any of the four categories of undergraduate economics courses examined, which include principles and survey, intermediate theory, statistics and econometrics, and other upper-division field courses.

[2] The data from the 2015 quinquennial survey were never made available or analyzed due to the unexpected passing in December 2014 of one of the original authors, Dr. Michael Watts. For more information about the earlier survey administrations, see Becker and Watts (1996); Becker and Watts (2001); Watts and Becker (2008); and Watts and Schaur (2011).

[3] In 2020, a response of 0 represented an instructional strategy or materials "never" used; 1 indicated strategies used "very rarely" or 1 – 10% of the time; 2 represented methods used "rarely" or 11 – 33% of the time; 3 identified activities used "occasionally" or 34 – 50% of the time; 4 represented strategies used "frequently" or 51 – 65% of the time; 5 indicated activities used "very frequently" or 66 – 85% of the time; and 6 denoted methods used by an instructor "usually or always" or 86 – 100% of the time. On the 0 – 4 scale from the prior surveys, a response of 3 indicated an instructional strategy used "frequently" or 34 – 65% of the time; a response of 4 indicated an instructional strategy used "almost always" or 66 – 100% of the time.

[4] See Asarta et al. (2021) and Harter and Asarta (2022) for more discussion of the 2020 survey administration and differences in the findings from using the 0 – 6 scale compared to the 0 – 4 scale.

Table 1
Independent Variable Definitions.

Variable	Definition
I. School Carnegie Classifications	
Baccalaureate	1 if instructor works at a baccalaureate school
Master's	1 if instructor works at a master's school
Doctoral	1 if instructor works at a doctoral or research school
II. Instructor and Departmental Characteristics	
Female	1 if instructor is female*
Lecturer	1 if instructor holds rank of lecturer or instructor
Assistant Professor	1 if instructor holds rank of assistant professor
Associate Professor	1 if instructor holds rank of associate professor
Full Professor	1 if instructor holds rank of full professor
English 2 L	1 if instructor speaks English as a second language
Experience	Number of years the instructor has taught
Teaching Weight	Weight (percentage) for teaching in school decisions on promotion and tenure
Teaching Load	Average number of classes taught by tenured and tenure-track faculty in the respondent's department in an academic year
Class Size	Average number of students in classes in the respondent's department

* Respondents who identified as male or non-binary are coded as zero.

Table 2
Summary Statistics for Independent Variables by Course Type.

	Principles and Survey Courses		Intermediate Theory Courses		Statistics and Econometrics Courses		Other Upper-Division Field Courses		Full Instructor Sample	
Variable	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)
I. School Carnegie Classifications										
Baccalaureate	0.261	(0.440)	0.271	(0.445)	0.284	(0.452)	0.253	(0.435)	0.230	(0.421)
Master's	0.275	(0.447)	0.271	(0.445)	0.222	(0.417)	0.213	(0.410)	0.211	(0.408)
Doctoral	0.464	(0.499)	0.458	(0.499)	0.493	(0.501)	0.534	(0.499)	0.558	(0.497)
II. Instructor and Departmental Characteristics										
Female*	0.369	(0.483)	0.319	(0.467)	0.329	(0.471)	0.348	(0.477)	0.354	(0.479)
Lecturer	0.108	(0.311)	0.100	(0.300)	0.058	(0.234)	0.069	(0.254)	0.089	(0.285)
Assistant Professor	0.261	(0.440)	0.258	(0.438)	0.302	(0.460)	0.255	(0.436)	0.258	(0.438)
Associate Professor	0.239	(0.427)	0.235	(0.425)	0.258	(0.438)	0.231	(0.422)	0.229	(0.421)
Full Professor	0.392	(0.489)	0.406	(0.492)	0.382	(0.487)	0.445	(0.497)	0.424	(0.495)
English 2 L	0.149	(0.356)	0.168	(0.374)	0.218	(0.414)	0.147	(0.355)	0.167	(0.374)
Experience (in hundreds)	0.177	(0.121)	0.174	(0.120)	0.163	(0.117)	0.186	(0.126)	0.182	(0.125)
Teaching Weight	0.393	(0.226)	0.370	(0.226)	0.389	(0.216)	0.356	(0.220)	0.345	(0.223)
Teaching Load	5.258	(1.732)	4.956	(1.697)	5.049	(1.573)	4.828	(1.614)	4.787	(1.719)
Class Size	95.094	(135.094)	42.016	(52.340)	29.413	(17.894)	30.380	(22.925)	55.980	(69.328)
N	498		310		225		577		729	

* Respondents who identified as male or non-binary are coded as zero. The full instructor sample class size means and standard deviations were compiled as an average of each instructor's average class size.

characteristics of the instructor's school and department. Types of institutions are defined based on the Carnegie classifications of baccalaureate, master's, and doctoral schools. Instructor characteristics include indicators for identifying as female, having English as a second language, and academic rank. Instructors were also asked to provide their years of teaching experience. Additionally, departmental information was collected about average class sizes for each course type, typical annual teaching loads measured as the average number of classes taught by tenured and tenure-track faculty in the department, and the percentage or weight placed on teaching in departmental decisions about tenure and promotion.

Table 2 presents descriptive statistics for the independent variables. Recognizing that average school, instructor, and departmental characteristics may be different across course types, we report separate descriptive statistics for the four different types of undergraduate economics courses included in the survey. This methodology enhances the work of Harter et al. (2015a), which displayed summary statistics for the sample as a whole and did not include separate mean variable estimates by course type. Sample sizes differ across course types. Three-quarters of the instructors in our sample teach more than one type of course, and a total of 1610 courses are represented. Relative to the sample of courses in Harter et al. (2015a), the current study has a larger share of instructors teaching other upper-division field courses. The final column in Table 2 shows the combined results for the full sample of 729 instructors, with 23% of academics hailing from baccalaureate institutions, 21% from master's schools, and 56% from doctoral institutions.[5] Compared to

[5] This analysis does not include instructors teaching at associate's schools due to a small number of survey responses from associate's school instructors.

Harter et al. (2015b), which examined instructor teaching weights using a sample of 1474 instructors from the four prior surveys, our faculty sample includes a similar percent of instructors teaching at baccalaureate schools but smaller (larger) shares of instructors from master's (doctoral) institutions. Since all surveys have been drawn from convenience samples and use self-reported data, we have no way of knowing whether respondents are representative of all undergraduate economics faculty in the United States. Even so, the survey results have remained generally consistent over this 25-year period despite different source lists and response rates.

Female instructors represent 37% of principles and survey course instructors and 32 – 35% of intermediate theory, statistics and econometrics, and other upper-division field course instructors. Statistics and econometrics courses have the largest share of instructors for whom English is their second language. In terms of departmental characteristics, principles and survey course instructors have a higher average teaching weight used in decisions on promotion and tenure relative to instructors teaching the other course types. Additionally, the highest teaching loads are reported by principles and survey course instructors. These results may be associated with having a large share of principles and survey course faculty at the academic rank of *lecturer* since they generally teach more classes per semester than tenured or tenure-track faculty (Chen and Carroll, 2000). In the final column, the class size mean for the full instructor sample was compiled as the average of each instructor's average class size since respondents reported an average institutional class size for each course type they taught. Not surprisingly, class sizes for principles and survey courses were the largest, averaging 95.1 students per class. Moreover, class sizes in all course types have increased from the average class sizes found in the Harter et al. (2015a) sample.

Table 3 presents summary statistics for 15 dependent variables representing teaching methods and materials used by instructors in each of the four types of courses and for the full instructor sample. Each dependent variable is a binary indicator; we followed the methodology of Harter et al. (2015a) to develop these variables for the individual course types. The *Lecture usually or always* variable is equal to 1 for an instructor who indicated using lecture 66% or more of the time, and equal to 0 otherwise. For all other outcome variables, the teaching methods and materials were used much less frequently. Therefore, if a respondent indicated the use of an instructional strategy at all, we coded the variable equal to 1. We entered a zero when an instructor reported no use of the teaching method or material or did not respond to the item for a particular teaching strategy but completed other items for that course type. Additionally, given the prevalence of online course materials offered by publishing companies and other textbook providers, the use of publisher-developed workbooks, study guides, and tutorials is the combined response from two separate survey items asking instructors about the use of these items first in print and then online. All other dependent variables were listed as separate questions in the survey for each of the four types of courses. Furthermore, this study extends earlier work by including a dependent variable for the use of online adaptive learning technologies offered by publishing companies.

To create the indicators for the full instructor sample, we used the following methodology. If an instructor used a teaching method in at least one course type, we counted the use of this method as equal to 1, and 0 otherwise. For example, if an instructor used *Lecture usually* or *always* in both a principles and survey course and an intermediate theory course (equal to 1 for each course type), then the lecture indicator equals 1 for the instructor in the full sample. If an instructor did not indicate using lecture in any course type, the variable is coded as a 0. Instructors in our sample teach an average of 2.2 of the 4 course types. We find strong correlations for the use of teaching methods across course types, suggesting instructors tend to use the same teaching methods for each course type they teach, although not always. For the use of *Lecture usually or always*, estimates for the pairwise correlation coefficients (Pearson's R) between principles and survey courses and other course types range from 0.62 in other upper-division field courses to 0.86 in intermediate theory courses. The correlations between principles and survey and other course types for the use of computer labs range from 0.38 in statistics and econometrics courses to 0.71 in intermediate theory courses. As a result, the mean values for each teaching method in the

Table 3
Summary Statistics for Dependent Variables by Course Type.

	Principles and Survey Courses	Intermediate Theory Courses	Statistics and Econometrics Courses	Other Upper-Division Field Courses	Full Instructor Sample
Variable	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Lecture usually or always	0.655 (0.476)	0.697 (0.460)	0.653 (0.477)	0.562 (0.497)	0.708 (0.455)
Cooperative learning	0.647 (0.479)	0.568 (0.496)	0.649 (0.478)	0.667 (0.472)	0.658 (0.475)
Overhead projector/document camera	0.448 (0.498)	0.316 (0.466)	0.396 (0.490)	0.388 (0.488)	0.438 (0.496)
Computer generated displays/ PowerPoint	0.892 (0.311)	0.813 (0.391)	0.849 (0.359)	0.899 (0.301)	0.930 (0.255)
Team teaching	0.112 (0.316)	0.052 (0.221)	0.098 (0.298)	0.161 (0.368)	0.185 (0.389)
Computer lab activities	0.171 (0.377)	0.165 (0.371)	0.698 (0.460)	0.250 (0.433)	0.337 (0.473)
Classroom experiments	0.458 (0.499)	0.339 (0.474)	0.253 (0.436)	0.366 (0.482)	0.418 (0.494)
References to lit/drama/music	0.408 (0.492)	0.371 (0.484)	0.240 (0.428)	0.355 (0.479)	0.370 (0.483)
References to sports	0.454 (0.498)	0.397 (0.490)	0.382 (0.487)	0.381 (0.486)	0.399 (0.490)
Use of workbooks/study guides/ tutorials (print or online)	0.436 (0.496)	0.232 (0.423)	0.200 (0.401)	0.133 (0.340)	0.342 (0.475)
Use of adaptive learning	0.215 (0.411)	0.077 (0.268)	0.067 (0.250)	0.071 (0.257)	0.169 (0.375)
Use of instructor notes	0.526 (0.500)	0.590 (0.493)	0.627 (0.485)	0.567 (0.496)	0.601 (0.490)
Use of instructor problem sets	0.757 (0.429)	0.839 (0.368)	0.876 (0.331)	0.776 (0.417)	0.824 (0.381)
Use of press readings	0.635 (0.482)	0.581 (0.494)	0.422 (0.495)	0.633 (0.483)	0.609 (0.488)
Use of scholarly readings	0.297 (0.457)	0.484 (0.501)	0.516 (0.501)	0.747 (0.435)	0.657 (0.475)
N	498	310	225	577	729

full sample tend to be larger than the means for each individual course type.

Lecture continues to be used as the primary instructional method in all course types. About 66% of instructors in principles and survey courses and 70% of instructors in intermediate theory courses lectured usually or always, as did 65% of statistics and econometrics course instructors. By contrast, 56% of other upper-division field course instructors used lecture usually or always, and a larger share of them incorporated cooperative learning into their classes compared to the instructors of other course types. About 22% of principles and survey instructors used adaptive learning technologies relative to 7 – 8% of instructors in all other course types. As might be expected, instructors used readings from scholarly publications in nearly three-quarters of other upper-division field courses but in less than one-third of principles and survey courses.

Estimates of pairwise correlation coefficients (Pearson's *R*) for using the different teaching methods and materials within a course are low, and the majority of the coefficients are less than 0.30 across all course types. The highest estimates are for the combined use of instructor-developed notes and instructor-developed problem sets, with correlations ranging from 0.23 in principles and survey courses to 0.43 in statistics and econometrics courses. Thus, we estimate the effects of each teaching method separately for each course type. One limitation of this method is that small sample sizes prevent estimations for some of the dependent variables. Because the format of the 2020 survey administration was changed and new questions were introduced, we use only responses to the 2020 quinquennial faculty survey, in contrast with the study by Harter et al. (2015a) that used a sample combined from the first four quinquennial surveys. As a result, we have a smaller sample size of instructors for each course type compared to the sample sizes of the prior study. However, instructors in the current study came from a single list (U.S., 2020) as opposed to the combined sample of instructors used in the Harter et al. (2015a) study. Additionally, our sample includes larger percentages of instructors who teach other upper-division field courses and statistics and econometrics courses relative to the respondent sample in the previous study.

The summary statistics by school Carnegie classification type for the independent and dependent variables for the full sample of instructors are shown in Tables A1 and A2 in the Appendix. Faculty at doctoral schools have larger class sizes relative to instructors at other schools, especially in principles and survey courses. Departmental policies and faculty time allocations also vary across institutions by school type. Faculty at baccalaureate and master's institutions have higher average teaching weights and teaching loads than doctoral school faculty, which is consistent with prior research showing that doctoral school instructors tend to have a higher percentage of their promotion and tenure decisions based on research relative to faculty at other types of institutions (Harter et al., 2011).

4. Results

4.1. Carnegie School Effects

We first estimate how teaching methods and materials in the four types of undergraduate economics courses vary across different types of schools. Tables 4A and 4B show the results of ordinary least squares (OLS) regressions of Carnegie school classifications on each of the binary dependent variables for the four course types. As noted in Harter et al. (2015a), one benefit of using OLS for these estimations is that it allows the coefficients for the school type indicators to be added to the constant term coefficient to determine the share of faculty using each teaching method at each type of school except in the case of the "almost always" lecture equation. All equations are linear for an outcome variable equal to 1 if the instructor used the instructional method at all, except in the *Lecture usually or always* equation, for which the binary dependent variable takes a value of 1 if the respondent usually or always lectures, and 0 otherwise. Each specification includes only the independent variables for the different school types with doctoral schools as the omitted variable. Each row represents a separate regression, and all estimates incorporate robust standard errors.

For all equations, the results indicate low R^2 values, and the constant terms are consistently significant, indicating instructors' teaching methods and materials are largely influenced by factors other than the characteristics associated with the type of school where they teach. Results suggest teaching methods and materials may differ considerably among instructors at baccalaureate, master's, and doctoral institutions across the curriculum. Summing the coefficients for the baccalaureate (master's) faculty members on these variables and the coefficient on the constant term gives us the percentage of respondents from baccalaureate (master's) schools that use a given non-lecture teaching method. Comparing these two types of institutions, we observe that a larger percentage of instructors at baccalaureate schools use cooperative learning, computer lab activities, and classroom experiments (except in statistics and econometrics) along with instructor-developed notes and problem sets and press and scholarly readings in all course types than master's school instructors. A larger percentage of instructors at master's institutions use overhead projectors/document cameras, adaptive learning activities (except in statistics and econometrics) and workbooks/study guides/tutorials along with in-class references to literature, drama, or music and also sports in all types of courses as compared to faculty at baccalaureate schools.

Additionally, compared to doctoral school faculty, instructors at baccalaureate schools are significantly less likely to lecture usually or always in other upper-division field courses and in intermediate theory courses at master's institutions. Faculty at master's institutions are significantly more likely than doctoral school faculty to use computer labs in principles and survey courses. Also, instructors at baccalaureate schools are significantly more likely than their doctoral school peers to incorporate readings from press articles in all course types apart from principles and survey courses as well as scholarly publications except in other upper-division field courses. Instructors at master's institutions are significantly more likely than doctoral faculty to include sports references in all course types, except intermediate theory courses, and significantly less likely to use adaptive learning technologies in principles and survey courses.

These institutional effects findings are generally consistent with the results from Harter et al. (2015a). The prior study found more significant differences across course types, particularly for the measures of an instructor's time spent lecturing and the use of classroom

Table 4A
OLS Estimates, School Effects by Carnegie Classification (Robust Std. Errors in Parentheses).

	Principles and Survey Courses				Intermediate Theory Courses			
Variable	Constant	Baccalaureate	Master's	R^2	Constant	Baccalaureate	Master's	R^2
Lecture usually or always	0.675***	–0.098	0.019	0.009	0.768***	–0.113	–0.149*	0.021
	(0.031)	(0.053)	(0.050)		(0.036)	(0.063)	(0.064)	
Cooperative learning	0.606***	0.171***	–0.015	0.026	0.486***	0.264**	0.038	0.051
	(0.032)	(0.049)	(0.053)		(0.042)	(0.063)	(0.069)	
Overhead projector/document camera	0.567***	–0.329**	–0.122*	0.073	0.366***	–0.188**	0.003	0.033
	(0.033)	(0.050)	(0.054)		(0.041)	(0.058)	(0.067)	
Computer generated displays/PowerPoint	0.874***	0.026	0.038	0.003	0.810***	0.035	–0.024	0.003
	(0.022)	(0.034)	(0.033)		(0.033)	(0.052)	(0.056)	
Team teaching	0.117***	–0.001	–0.015	0.0004	0.035*	0.036	0.024	0.005
	(0.021)	(0.035)	(0.034)		(0.016)	(0.032)	(0.030)	
Computer lab activities	0.113***	0.126**	0.092*	0.022	0.113***	0.102	0.090	0.017
	(0.021)	(0.043)	(0.040)		(0.027)	(0.052)	(0.051)	
Classroom experiments	0.437***	0.101	–0.021	0.010	0.338***	0.019	–0.017	0.001
	(0.033)	(0.055)	(0.053)		(0.040)	(0.066)	(0.065)	
References to lit/drama/music	0.437***	–0.068	–0.043	0.004	0.366***	0.003	0.015	0.0002
	(0.033)	(0.054)	(0.053)		(0.041)	(0.067)	(0.067)	
References to sports	0.381***	–0.046	0.085*	0.010	0.352***	0.041	0.124	0.011
	(0.025)	(0.042)	(0.042)		(0.040)	(0.067)	(0.068)	
Use of workbooks/study guides/tutorials (print or online)	0.494***	–0.232***	0.010	0.044	0.246***	–0.116*	0.063	0.025
	(0.033)	(0.051)	(0.054)		(0.036)	(0.052)	(0.062)	
Use of adaptive learning	0.277***	–0.139***	–0.095*	0.021	0.092***	–0.032	–0.020	0.003
	(0.030)	(0.042)	(0.044)		(0.024)	(0.036)	(0.037)	
Use of instructor notes	0.550***	–0.004	–0.083	0.005	0.627***	–0.008	–0.127	0.013
	(0.033)	(0.005)	(0.054)		(0.041)	(0.067)	(0.068)	
Use of instructor problem sets	0.727***	0.157***	–0.041	0.033	0.880***	0.013	–0.166**	0.043
	(0.029)	(0.041)	(0.049)		(0.027)	(0.044)	(0.057)	
Use of press readings	0.610***	0.074	0.017	0.004	0.542***	0.160*	–0.018	0.023
	(0.032)	(0.052)	(0.052)		(0.042)	(0.065)	(0.069)	
Use of scholarly readings	0.247***	0.107*	0.082	0.011	0.408***	0.223**	0.056	0.034
	(0.028)	(0.051)	(0.049)		(0.041)	(0.067)	(0.069)	
N	498				310			

Note: Estimates are significant at *p < 0.05, **p < 0.01, and ***p < 0.001.

experiments. It is possible that differential increases in class sizes, teaching weights, and teaching loads across institutions over time have reduced differences in instructors' use of certain teaching methods. We recognize that these findings are not causal. Economics faculty may self-sort into institutional types for a variety of reasons. Instructors who have strong research interests may be more inclined to select a doctoral school, while faculty who prefer smaller class sizes may choose a baccalaureate institution. Furthermore, instructor characteristics may influence the use of teaching methods and materials. The distributions of faculty at economics departments by characteristics, such as academic rank and experience level, may differ across schools and institutional types, influencing instructor pedagogies. In the next section, we estimate the effects of instructor characteristics and departmental policies.

4.2. Instructor and Departmental Effects

Tables 5A, 5B, 5C, and 5D present the marginal effects for probit estimations of instructor characteristics and departmental policies on the dependent variables for each type of course. We estimate these models separately by course type since there are considerable differences in class sizes, curriculum, and assessment methods across different types of courses. Each row represents a different regression.[6] The Carnegie classification variables are not included in these estimates, although as a robustness check, we analyzed probit models including the school indicators using doctoral instructors as the reference group. The findings reveal fewer significant effects for the departmental variables, including teaching weights and teaching loads, when the school indicators are included.[7] This result is not surprising since doctoral institutions are typically larger "comprehensive" state universities that emphasize research as an important part of faculty members' duties. Instructors working at these institutions often teach fewer classes than faculty at non-doctoral schools, have greater expectations to present research at national and international conferences, and regularly publish research in prestigious journals (Morton and Beard, 2005). Thus, departmental characteristics, such as teaching loads and teaching

[6] We also examined these outcomes using a sample for all course types combined. The findings, available upon request, reveal some nuance and detail is lost for departmental variables. In particular, changes in class size become insignificant in estimates using the combined course sample. As an example, when estimating courses separately, we find class sizes are significantly and positively correlated with using an overhead projector or document camera in principles and survey and other upper-division field courses– an expected result. By contrast, the effect of class size on the use of that particular teaching method is not significant in the combined course estimate.

[7] These findings are available upon request.

Table 4B
OLS Estimates, School Effects by Carnegie Classification (Robust Std. Errors in Parentheses).

	Statistics and Econometrics Courses				Other Upper-Division Field Courses			
Variable	Constant	Baccalaureate	Master's	R^2	Constant	Baccalaureate	Master's	R^2
Lecture usually or always	0.658*** (0.045)	–0.048 (0.075)	0.042 (0.076)	0.005	0.640*** (0.027)	–0.297*** (0.048)	–0.014 (0.052)	0.066
Cooperative learning	0.622*** (0.046)	0.113 (0.072)	–0.021 (0.084)	0.013	0.610*** (0.028)	0.205*** (0.043)	0.024 (0.052)	0.034
Overhead projector/document camera	0.477*** (0.048)	–0.227** (0.072)	–0.077 (0.085)	0.039	0.419*** (0.028)	–0.172** (0.046)	0.061 (0.053)	0.031
Computer generated displays/PowerPoint	0.856*** (0.034)	–0.028 (0.058)	0.004 (0.060)	0.001	0.890*** (0.018)	–0.006 (0.032)	0.053 (0.028)	0.006
Team teaching	0.090*** (0.027)	0.035 (0.050)	–0.010 (0.047)	0.004	0.162*** (0.021)	–0.019 (0.036)	0.017 (0.041)	0.001
Computer lab activities	0.640*** (0.046)	0.157* (0.068)	0.060 (0.080)	0.021	0.198*** (0.023)	0.138** (0.045)	0.078 (0.046)	0.018
Classroom experiments	0.243*** (0.041)	–0.009 (0.067)	0.057 (0.077)	0.003	0.344*** (0.027)	0.053 (0.049)	0.038 (0.052)	0.002
References to lit/drama/music	0.207*** (0.039)	0.043 (0.067)	0.093 (0.076)	0.008	0.367*** (0.028)	–0.052 (0.047)	0.007 (0.052)	0.002
References to sports	0.324*** (0.045)	0.035 (0.075)	0.216* (0.084)	0.031	0.328*** (0.027)	0.049 (0.048)	0.192*** (0.053)	0.024
Use of workbooks/study guides/tutorials (print or online)	0.180*** (0.037)	–0.008 (0.060)	0.100 (0.074)	0.012	0.091*** (0.016)	0.019 (0.031)	0.177*** (0.043)	0.043
Use of adaptive learning	0.063** (0.023)	0.031 (0.043)	–0.023 (0.036)	0.006	0.071*** (0.015)	–0.017 (0.024)	0.018 (0.030)	0.002
Use of instructor notes	0.730*** (0.042)	–0.152* (0.075)	–0.270*** (0.083)	0.052	0.610*** (0.028)	–0.062 (0.050)	–0.131* (0.053)	0.011
Use of instructor problem sets	0.901*** (0.029)	0.021 (0.044)	–0.141* (0.067)	0.036	0.773*** (0.024)	0.063 (0.039)	–0.057 (0.047)	0.010
Use of press readings	0.360*** (0.046)	0.155* (0.078)	0.080 (0.084)	0.018	0.604*** (0.028)	0.115* (0.047)	–0.002 (0.052)	0.011
Use of scholarly readings	0.432*** (0.047)	0.333*** (0.071)	–0.052 (0.084)	0.101	0.753*** (0.025)	0.076 (0.040)	–0.119* (0.050)	0.023
N	225				577			

Note: Estimates are significant at *p < 0.05, **p < 0.01, and ***p < 0.001.

weights, may be distinctly correlated at different types of institutions. In our sample, the pairwise correlation coefficients (Pearson's *R*) between the average teaching load for tenured and tenure-track faculty and the percentage weight placed on teaching in promotion and tenure decisions are 0.33 at baccalaureate schools and 0.50 at doctoral schools.

The marginal effects results are reported at the mean values for the four continuous variables of instructors' years of teaching experience, departmental policies associated with teaching weights in promotion and tenure decisions, teaching loads, and class sizes for each course type. To address non-linear effects, we include a squared value for each continuous variable. Each estimation also includes indicators for instructor sex, academic rank, and having English as a second language. Marginal effects are calculated for discrete changes (Becker and Kennedy, 1992). Since all instructor indicator variables have median values of zero, we use zero as the base value and report the marginal effects for the difference in the probability of using an instructional method occurring when the indicator variable value changes from zero to one. Robust standard errors are included in all estimates.

The results indicate an instructor's sex may be associated with differences in the use of teaching methods and materials. Compared to male instructors, female faculty are 15- to 22-percentage points less likely to lecture usually or always in all undergraduate economics courses except in statistics and econometrics courses, and 23- to 28-percentage points more likely to use cooperative learning across the curriculum. Other than in statistics and econometrics courses, female instructors are 18- to 21-percentage points less likely than male faculty to make use of sports references. On the other hand, male instructors in all course types are 11- to 19-percentage points less likely than their female counterparts to incorporate news media and press articles into their undergraduate economics courses. These findings are generally consistent with the prior study by Harter et al. (2015a) indicating female faculty may be more likely than male instructors to use active learning methodologies and engaging course materials in undergraduate economics courses across the curriculum. These findings also supplement other research showing that female faculty tend to spend more time on teaching and less time on research than male faculty (Harter et al., 2011) and that women earning Ph.D. degrees may be less inclined to apply for tenure-track assistant professor positions (Ceci et al., 2014). In 2022, women represented about 24% of tenure-track faculty and 37% of non-tenure-track faculty at institutions offering a doctoral degree in economics, whereas women comprised 36% of tenure-track and 38% of non-tenure-track faculty in economics departments without doctoral degree programs (Chari and Levenstein, 2023). Of course, it is unclear whether these findings result from differences in jobs offered to males versus females or in job offers that are accepted by males versus females.

Instructors for whom English is a second language may be significantly more likely to use online adaptive learning technologies in principles and survey courses, although they may incorporate fewer cultural references in undergraduate economics courses than their native English-speaking peers. Speaking English as a second language is associated with a 14- to 24-percentage-point decrease in the

Table 5A
Probit Marginal Effect Estimates by Teaching Method, Principles and Survey Courses (Robust Std. Errors in Parentheses) $N = 498$.

Variable	Female	Lecturer	Assistant Professor	Associate Professor	English 2 L	Experience	Teaching Weight	Teaching Load	Class Size
Lecture usually or always	–0.149**	–0.027	–0.060	–0.099	–0.033	–0.103	–0.169	–0.021	–0.00003
	(0.047)	(0.085)	(0.083)	(0.062)	(0.059)	(0.291)	(0.112)	(0.017)	(0.0003)
Cooperative learning	0.226***	–0.003	0.025	–0.027	0.010	–0.261	0.140	0.017	–0.0003
	(0.043)	(0.091)	(0.090)	(0.067)	(0.068)	(0.330)	(0.130)	(0.018)	(0.0003)
Overhead projector/document camera	–0.014	0.025	0.134	0.136	0.123	0.403	–0.267*	–0.006	0.001***
	(0.049)	(0.095)	(0.088)	(0.069)	(0.066)	(0.329)	(0.127)	(0.019)	(0.0004)
Computer generated displays/ PowerPoint	0.045	0.047	0.084	0.052	0.079	0.052	0.015	–0.001	0.0003
	(0.042)	(0.070)	(0.064)	(0.052)	(0.055)	(0.321)	(0.125)	(0.015)	(0.0003)
Team teaching	0.032	–0.035	–0.012	–0.004	0.016	–0.066	0.028	–0.008	0.00005
	(0.024)	(0.021)	(0.030)	(0.026)	(0.029)	(0.130)	(0.043)	(0.007)	(0.0001)
Computer lab activities	0.015	0.098	0.059	0.090	–0.027	0.396	0.214*	0.005	–0.00001
	(0.033)	(0.080)	(0.070)	(0.052)	(0.040)	(0.205)	(0.092)	(0.013)	(0.0003)
Classroom experiments	0.094*	–0.161	–0.077	–0.134*	0.074	–0.603	–0.054	0.037*	–0.0002
	(0.047)	(0.091)	(0.089)	(0.067)	(0.063)	(0.328)	(0.125)	(0.018)	(0.0003)
References to lit/drama/music	–0.075	0.087	0.122	0.052	–0.238***	0.386	–0.085	–0.006	0.0003
	(0.049)	(0.091)	(0.087)	(0.068)	(0.059)	(0.325)	(0.131)	(0.018)	(0.0003)
References to sports	–0.206***	–0.021	–0.093	–0.097	–0.227***	–0.659*	–0.065	0.012	–0.0002
	(0.048)	(0.092)	(0.089)	(0.068)	(0.065)	(0.326)	(0.125)	(0.018)	(0.0003)
Use of workbooks/study guides/ tutorials (print or online)	–0.051	–0.037	–0.025	0.016	0.131*	0.065	–0.213	0.021	0.001*
	(0.048)	(0.089)	(0.089)	(0.068)	(0.064)	(0.333)	(0.127)	(0.019)	(0.0003)
Use of adaptive learning	0.030	0.098	0.186*	0.032	0.120*	0.278	–0.062	0.036*	0.001*
	(0.034)	(0.076)	(0.083)	(0.047)	(0.058)	(0.204)	(0.080)	(0.014)	(0.0003)
Use of instructor notes	–0.036	0.074	0.117	0.180**	0.007	0.068	–0.094	–0.014	–0.0002
	(0.049)	(0.090)	(0.087)	(0.065)	(0.066)	(0.330)	(0.127)	(0.018)	(0.0003)
Use of press readings	0.160***	–0.022	0.074	0.067	–0.089	0.364	0.113	–0.038*	–0.001
	(0.045)	(0.091)	(0.085)	(0.068)	(0.066)	(0.337)	(0.128)	(0.018)	(0.0003)
Use of scholarly readings	–0.036	–0.153*	0.043	–0.014	–0.067	–0.146	0.087	–0.024	–0.001
	(0.043)	(0.068)	(0.083)	(0.059)	(0.055)	(0.302)	(0.114)	(0.017)	(0.0003)

Note: Estimates are significant at *p < 0.05, **p < 0.01, and ***p < 0.001.

Table 5B
Probit Marginal Effect Estimates by Teaching Method, Intermediate Theory Courses (Robust Std. Errors in Parentheses) $N = 310$.

Variable	Female	Lecturer	Assistant Professor	Associate Professor	English 2 L	Experience	Teaching Weight	Teaching Load	Class Size
Lecture usually or always	–0.150*	–0.062	0.071	0.028	–0.118	0.220	–0.527**	–0.008	–0.001
	(0.062)	(0.116)	(0.094)	(0.071)	(0.078)	(0.409)	(0.164)	(0.022)	(0.001)
Cooperative learning	0.252***	–0.031	0.150	–0.039	–0.042	–0.040	0.115	0.022	–0.003
	(0.060)	(0.120)	(0.118)	(0.086)	(0.084)	(0.472)	(0.174)	(0.024)	(0.002)
Overhead projector/document camera	0.097	0.211	0.163	0.096	0.074	0.334	–0.157	–0.001	–0.001
	(0.053)	(0.117)	(0.110)	(0.071)	(0.067)	(0.305)	(0.122)	(0.019)	(0.001)
Computer labs	0.111	0.068	0.009	–0.087	–0.051	0.197	0.223	0.008	–0.0002
	(0.059)	(0.116)	(0.095)	(0.058)	(0.058)	(0.338)	(0.151)	(0.022)	(0.002)
Classroom experiments	0.006	–0.021	–0.098	–0.053	0.027	–0.878	–0.061	0.065*	–0.001
	(0.064)	(0.122)	(0.114)	(0.083)	(0.080)	(0.477)	(0.170)	(0.026)	(0.001)
References to lit/drama/music	–0.101	–0.043	0.088	–0.009	–0.242**	0.225	–0.101	–0.012	–0.001
	(0.062)	(0.124)	(0.124)	(0.088)	(0.071)	(0.474)	(0.169)	(0.024)	(0.001)
References to sports	–0.202***	0.053	0.073	–0.012	–0.189**	–0.503	0.005	–0.005	–0.004**
	(0.057)	(0.128)	(0.125)	(0.087)	(0.072)	(0.474)	(0.170)	(0.024)	(0.001)
Use of workbooks/study guides/ tutorials (print or online)	–0.024	–0.071	–0.091	–0.007	0.084	0.185	–0.214	0.025	–0.001
	(0.058)	(0.097)	(0.110)	(0.081)	(0.079)	(0.468)	(0.162)	(0.024)	(0.001)
Use of instructor notes	0.118	0.0001	0.049	0.073	–0.039	–0.447	0.092	–0.058*	0.001
	(0.060)	(0.120)	(0.120)	(0.083)	(0.080)	(0.470)	(0.168)	(0.025)	(0.001)
Use of instructor problem sets	0.102*	–0.312*	0.143*	0.047	0.026	–0.247	–0.164	–0.017	0.003
	(0.049)	(0.132)	(0.067)	(0.067)	(0.065)	(0.386)	(0.152)	(0.023)	(0.002)
Use of press readings	0.146*	–0.252*	0.173	0.110	–0.017	0.382	0.034	–0.020	–0.002
	(0.060)	(0.115)	(0.105)	(0.082)	(0.082)	(0.462)	(0.174)	(0.025)	(0.002)
Use of scholarly readings	0.012	–0.079	–0.009	0.013	–0.051	–0.315	0.424*	–0.048	–0.004**
	(0.064)	(0.124)	(0.123)	(0.085)	(0.081)	(0.471)	(0.175)	(0.026)	(0.001)

Note: Estimates are significant at *p < 0.05, **p < 0.01, and ***p < 0.001.

Table 5C
Probit Marginal Effect Estimates by Teaching Method, Statistics and Econometrics Courses (Robust Std. Errors in Parentheses) *N = 225*.

Variable	Female	Lecturer	Assistant Professor	Associate Professor	English 2 L	Experience	Teaching Weight	Teaching Load	Class Size
Lecture usually or always	–0.098	–0.013	–0.073	–0.065	0.028	0.124	–0.185	–0.012	0.0002
	(0.070)	(0.144)	(0.124)	(0.091)	(0.067)	(0.486)	(0.165)	(0.023)	(0.002)
Cooperative learning	0.233**	0.119	0.083	0.120	–0.094	–0.287	0.220	0.014	0.0002
	(0.072)	(0.163)	(0.137)	(0.101)	(0.089)	(0.600)	(0.231)	(0.031)	(0.003)
Overhead projector/document camera	0.038	0.259	0.005	0.112	–0.001	–0.286	–0.376	0.045	0.006
	(0.077)	(0.161)	(0.131)	(0.100)	(0.084)	(0.559)	(0.201)	(0.030)	(0.003)
Computer generated displays/ PowerPoint	–0.009	0.009	0.017	0.017	0.030	–0.139	–0.037	–0.031	–0.001
	(0.059)	(0.119)	(0.085)	(0.067)	(0.059)	(0.367)	(0.141)	(0.024)	(0.002)
Team teaching	0.0150	–0.007	0.062	0.014	0.036	–0.083	–0.003	0.001	0.0001
	(0.023)	(0.044)	(0.067)	(0.034)	(0.039)	(0.190)	(0.060)	(0.010)	(0.001)
Computer lab activities	0.120*	–0.093	–0.166	–0.058	–0.125	–0.132	–0.047	0.027	0.001
	(0.048)	(0.145)	(0.125)	(0.083)	(0.079)	(0.409)	(0.143)	(0.021)	(0.002)
Classroom experiments	0.045	–0.236	–0.097	–0.113	–0.043	–0.371	0.038	0.049	0.001
	(0.080)	(0.131)	(0.128)	(0.096)	(0.090)	(0.614)	(0.201)	(0.031)	(0.003)
References to lit/drama/music	–0.032	–0.037	0.020	0.011	–0.163*	–0.102	–0.089	0.048	0.002
	(0.071)	(0.143)	(0.127)	(0.095)	(0.070)	(0.537)	(0.203)	(0.031)	(0.003)
References to sports	–0.077	–0.008	–0.274*	–0.161	–0.173	–1.393*	–0.048	0.037	–0.001
	(0.078)	(0.169)	(0.125)	(0.102)	(0.088)	(0.632)	(0.224)	(0.031)	(0.003)
Use of adaptive learning	0.001	0.180	0.197	0.003	0.054	0.150	0.061	–0.001	0.001
	(0.013)	(0.133)	(0.136)	(0.019)	(0.042)	(0.144)	(0.077)	(0.005)	(0.001)
Use of instructor notes	–0.045	–0.118	0.238*	0.108	0.048	0.518	–0.171	–0.062*	0.004
	(0.080)	(0.180)	(0.107)	(0.093)	(0.087)	(0.647)	(0.204)	(0.029)	(0.003)
Use of instructor problem sets	0.012	–0.288	0.016	–0.029	–0.004	–0.429	–0.107	0.007	0.002
	(0.044)	(0.163)	(0.084)	(0.060)	(0.051)	(0.380)	(0.109)	(0.016)	(0.002)
Use of press readings	0.194**	0.171	0.037	–0.013	–0.245**	0.212	0.456*	–0.019	0.007*
	(0.071)	(0.152)	(0.141)	(0.104)	(0.078)	(0.602)	(0.214)	(0.030)	(0.003)
Use of scholarly readings	0.140	–0.267	–0.024	–0.050	–0.164	–0.155	0.402	–0.055	–0.002
	(0.073)	(0.160)	(0.143)	(0.099)	(0.085)	(0.601)	(0.211)	(0.030)	(0.003)

Note: Estimates are significant at *p < 0.05, **p < 0.01, and ***p < 0.001.

Table 5D
Probit Marginal Effect Estimates by Teaching Method, Other Upper-Division Field Courses (Robust Std. Errors in Parentheses) *N = 577*.

Variable	Female	Lecturer	Assistant Professor	Associate Professor	English 2 L	Experience	Teaching Weight	Teaching Load	Class Size
Lecture usually or always	–0.217***	–0.017	0.016	0.002	0.074	–0.084	–0.252	0.018	0.007***
	(0.046)	(0.095)	(0.087)	(0.062)	(0.057)	(0.312)	(0.132)	(0.018)	(0.002)
Cooperative learning	0.282***	0.158	0.108	0.109	–0.045	–0.121	0.304*	0.025	0.001
	(0.042)	(0.090)	(0.088)	(0.066)	(0.066)	(0.333)	(0.142)	(0.019)	(0.002)
Overhead projector/document camera	–0.021	0.104	0.080	0.051	0.159**	0.399	–0.170	0.039	0.005**
	(0.045)	(0.092)	(0.086)	(0.063)	(0.061)	(0.297)	(0.130)	(0.020)	(0.002)
Team teaching	0.044	–0.022	–0.036	–0.021	–0.012	–0.068	0.018	–0.015	–0.0003
	(0.036)	(0.058)	(0.056)	(0.041)	(0.042)	(0.230)	(0.100)	(0.014)	(0.001)
Computer lab activities	0.035	–0.006	–0.043	0.004	–0.029	–0.237	0.173	–0.017	–0.004*
	(0.040)	(0.083)	(0.071)	(0.054)	(0.049)	(0.278)	(0.116)	(0.016)	(0.002)
Classroom experiments	0.084	–0.034	–0.076	–0.124*	–0.043	–0.844*	0.158	0.064**	0.002
	(0.047)	(0.091)	(0.088)	(0.061)	(0.062)	(0.328)	(0.137)	(0.020)	(0.002)
References to lit/drama/music	–0.070	0.091	0.032	0.008	–0.144*	0.226	–0.018	–0.001	0.001
	(0.044)	(0.094)	(0.089)	(0.063)	(0.056)	(0.311)	(0.134)	(0.019)	(0.002)
References to sports	–0.177***	0.049	–0.134	–0.073	–0.166**	–0.572	–0.003	0.045*	0.001
	(0.046)	(0.093)	(0.086)	(0.064)	(0.062)	(0.319)	(0.138)	(0.021)	(0.002)
Use of instructor notes	–0.077	0.051	0.034	0.062	0.056	–0.447	–0.186	–0.017	–0.001
	(0.046)	(0.090)	(0.085)	(0.061)	(0.061)	(0.306)	(0.132)	(0.018)	(0.002)
Use of instructor problem sets	–0.029	–0.112	0.080	–0.043	0.021	–0.294	0.115	–0.004	0.002
	(0.034)	(0.078)	(0.044)	(0.046)	(0.041)	(0.197)	(0.091)	(0.013)	(0.001)
Use of press readings	0.113**	0.001	0.0004	0.0001	–0.084	–0.062	–0.001	0.005	–0.001
	(0.040)	(0.088)	(0.082)	(0.060)	(0.060)	(0.291)	(0.123)	(0.017)	(0.002)
Use of scholarly readings	0.056	–0.035	0.035	–0.012	–0.123*	–0.152	–0.127	–0.047*	–0.006***
	(0.038)	(0.085)	(0.073)	(0.057)	(0.059)	(0.276)	(0.116)	(0.018)	(0.002)

Note: Estimates are significant at *p < 0.05, **p < 0.01, and ***p < 0.001.

probability of using references to literature, drama, or music across the curriculum and a 17- to 23-percentage-point decrease in the probability of using sports references in all course types except in statistics and econometrics courses. This finding is not surprising given that foreign-born faculty teaching in the United States come from a variety of countries and cultural backgrounds. Additionally, the results indicate a one-year increase in instructor experience is not a significant determinant for the use of many of the teaching methods and materials. When examining the effects of departmental policies, a one-course increase in an instructor's typical teaching load in a department is associated with an increased probability of using classroom experiments in all course types except in statistics and econometrics courses. A higher average class size is associated with a lower probability of using scholarly readings in intermediate theory and other upper-division field courses, although the effects are small. To further examine the effects of changes in instructor experience and departmental policies related to teaching, the next section presents an analysis of elasticity coefficients for the four continuous independent variables used in our study.

4.3. *Effect of Changes in Instructor Experience and Departmental Policies*

Table 6 displays elasticity measures for a percentage change in the probability of using a given teaching method resulting from a one-percent change in the mean value for the measures of instructor experience, teaching weight, teaching load, and class size, including a squared-value component to account for non-linear effects. For greater clarity, we list only coefficient values and standard errors for the statistically significant coefficients for each course type and include visuals, in the form of figures, for each measure. Across the four course types, the elasticity coefficients are significant for an instructor's years of experience four times and the average teaching weight placed on an instructor's departmental promotion and tenure decisions in six instances. Teaching load is significant eight times, while class size is significant in 11 cases.

We identify statistically significant relationships between the continuous variables and teaching methods and materials used and quantify some of the results by examining the predicted probabilities of using the methods and materials at various cut-points for the continuous variables. For consistency with the work by Harter et al. (2015a), we use the same various cut-points for each type of continuous variable that were used in the prior study. For teaching experience, we look at the probabilities for instructors with varying years of experience of 1, 7, 14, and 21 years that might show a differential effect based on academic rank and tenure. An instructor with one year of experience is likely untenured, while an instructor with 21 years of experience is likely tenured and promoted to associate or full professor; these instructors might make different pedagogical choices at different stages of their careers. The probability estimates are illustrated below in Fig. 1. Our results show that an increase in an instructor's years of experience decreases the probability of using sports references in principles and survey and statistics and econometrics courses and incorporating classroom experiments in intermediate theory and other upper-division field courses. Principles and survey course instructors with one year of experience have a 73% probability of using sports references, but the probabilities decrease to 67%, 61%, and 56% for instructors with 7, 14, and 21 years of experience, respectively. In intermediate theory courses, instructors with one year of experience have a 49% probability of using classroom experiments, and this probability decreases to 38% for instructors with 21 years of experience. Consistent with the principles and survey course results, the findings for statistics and econometrics courses indicate a decrease in the probabilities of using sports references as instructor experience increases. In other upper-division field courses, instructors with one year of experience have a 57% probability of using classroom experiments, while the probability decreases to 44% for instructors with 21 years of experience.

Our finding that more experience is correlated with less use of classroom experiments is similar to the results in Harter et al. (2015a). Instructors with more experience may be less familiar with the growing body of classroom experiments for undergraduate economics courses or may perceive that using classroom experiments is too costly in terms of preparation or the use of course time. Unlike the prior study, however, we find more experience is associated with less use of sports references. Sports economics is a relatively young and growing field. Courses in sports economics are popular among students and are increasingly being offered by economics departments as other upper-division field courses (Hall et al., 2017).[8] Even so, sports economics is still perceived "by some as a 'fringe' discipline in the field" (Hall et al., 2017, p. 4). Instructors with more experience may believe using sports references in class is less valuable than other examples or may be less familiar with examples from sports economics. Additionally, instructors tend to teach the way they have been taught and use course examples and materials reflecting the world they have experienced (Stevenson and Zlotnick, 2018). More experienced instructors may be less likely to use sports references if those types of references were not modeled to them during their undergraduate and graduate education.

In examining results for the weight placed on teaching in an instructor's departmental promotion and tenure decisions, we find that increasing the teaching weight in promotion and tenure decisions is associated with an increase in the use of computer lab activities in principles and survey courses, press readings in statistics and econometrics courses, and cooperative learning activities in other upper-division field courses. We also find that increasing teaching weights in promotion and tenure decisions is associated with a decrease in *usually or always* lecturing in intermediate theory courses. These results, shown in Fig. 2, indicate that an increase in the weight placed on teaching in departmental promotion and tenure decisions from 25% to 75% increases the probability of an instructor including computer lab activities in principles and survey courses from 11% to 27%. Alternatively, an increase in teaching weights from 25% to 75% reduces the probability of an intermediate theory course instructor lecturing most of the time from 80% to 58%. This result is consistent with prior work suggesting faculty who are expected to achieve very high levels of research activity may be less likely to

[8] The *Journal of Sports Economics*, established in 2000, was the first field journal in this area. A second field journal, the I*nternational Journal of Sport Finance*, was created in 2006. Hall et al. (2017) found 17% of liberal arts colleges and 29.5% of large, national universities offered a sports economics course.

Table 6
Elasticity Values for 1% Changes Using Significant Coefficients from Marginal Effects Estimates for Continuous Variables Calculated at Variables' Mean Values, Including a Squared Term (Robust Std. Errors in Parentheses).

Variable	Experience	Teaching Weight	Teaching Load	Class Size
Lecture usually or always				
I		–0.267**		
		(0.091)		
O				0.332***
				(0.084)
Cooperative learning				
O		0.201*		
		(0.098)		
Overhead projector/document camera				
P		–0.234*		0.310***
		(0.112)		(0.080)
O			0.472*	0.355**
			(0.240)	(0.126)
Computer lab activities				
P		0.616*		
		(0.267)		
O				–0.448*
				(0.209)
Classroom experiments				
P			0.356*	
			(0.177)	
I	–0.373*		0.779*	
	(0.189)		(0.304)	
O	–0.340**		0.668**	
	(0.126)		(0.210)	
References to sports				
P	–0.202*			
	(0.096)			
I				–0.358*
				(0.145)
S	–0.433*			
	(0.189)			
O			0.420*	
			(0.191)	
Use of workbooks				
P				0.151*
				(0.069)
Use of adaptive learning				
P			1.330**	0.387*
			(0.476)	(0.151)
S				2.314*
				(1.142)
Use of instructor notes				
I			–0.505*	
			(0.242)	
Use of press readings				
S		0.344*		0.423*
		(0.174)		(0.177)
Use of scholarly readings				
I		0.304*		–0.330**
		(0.136)		(0.125)
O			–0.304*	–0.242**
			(0.126)	(0.073)

Notes: P = Principles and Survey; I = Intermediate Theory; S = Statistics and Econometrics;
O = Other Upper-Division Field. Estimates are significant at *p < 0.05, **p < 0.01, and ***p < 0.001.

engage in active learning teaching methods (Apkarian et al., 2021). In contrast with the findings from Harter et al. (2015a), we find that, as teaching weight increases, there is a higher probability of using press articles in statistics and econometrics courses. In departments where the teaching weight is 75%, the probability of using press articles is 66% compared to 45% when the teaching weight is 25%. In other upper-division field courses, an increase in departmental weight towards teaching from 25% to 75% increases the probability of an instructor's use of cooperative learning activities from 51% to 65%, a result that is consistent with the Harter et al. (2015a) study. These results suggest that changing departmental policies to increase the weight of teaching in promotion and tenure decisions could lead to less lecture and more use of student-centered activities, although teaching weight effects vary by course type considerably. Furthermore, our research shows that instructors' average teaching weights have increased since the findings in the prior study, which may explain our finding fewer significant effects for increases in teaching weights.

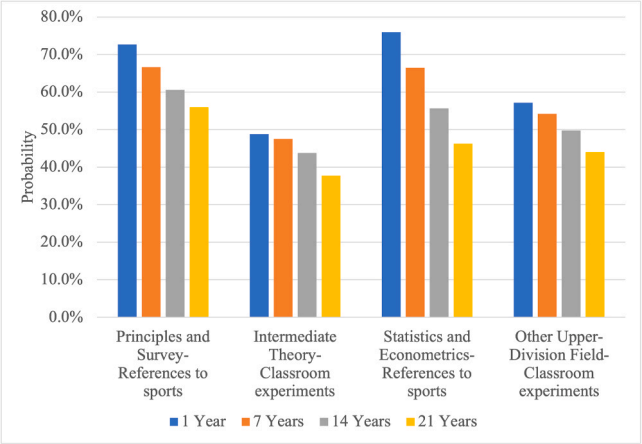

Fig. 1. Predicted Probabilities for Levels of Teaching Experience for All Course Types.

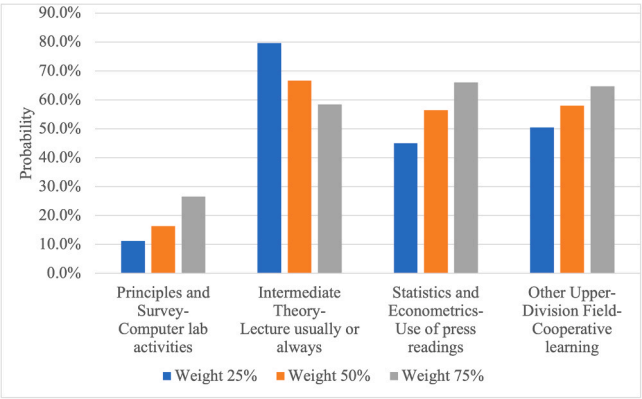

Fig. 2. Predicted Probabilities for Teaching Weights in Promotion and Tenure Decisions for All Course Types.

Even though the average number of classes taught by tenured and tenure-track faculty is not a significant determinant of instructors usually or always lecturing, an increase in teaching load is positively correlated with using active learning methodologies in all types of courses except in statistics and econometrics courses. Specifically, we find that increasing teaching loads from four to eight classes per year increases the probability of principles and survey course instructors using classroom experiments from 48% to 58% and online adaptive learning technologies from 10% to 23%. An increase in teaching load from four to eight classes per year also increases the probability of using classroom experiments from 35% to 56% in intermediate theory courses and from 40% to 46% in other upper-division field courses. These results are illustrated in Fig. 3 and suggest that instructors who have higher teaching loads may be more likely to use student-centered teaching activities and materials. It is also possible that instructors who have more interest in using active learning strategies may be more inclined to take faculty positions in departments with higher teaching loads. Compared to the work by Harter et al. (2015a), we find fewer significant effects for a change in teaching loads. These results may be associated with our finding that faculty's average teaching loads have increased since the time the prior survey administrations were completed.

The elasticity estimates for class size present the largest number of statistically significant results. Specifically, an increase in principles and survey class size from 40 to 100 students increases the probability of using an overhead projector/document camera from 36% to 46% and online adaptive learning technologies from 11% to 14%. The same change in intermediate theory class size decreases the probability of using references to sports from 45% to 27% and incorporating scholarly readings from 53% to 33%. These class size results for a change from 40 to 100 students in principles and survey and intermediate theory courses are illustrated below in Fig. 4, while Fig. 5 shows the effects of an increase from 20 to 50 students in statistics and econometrics courses and other upper-division field courses. When class sizes increase from 20 to 50 students in statistics and econometrics courses, there is an increase in the probability of an instructor using press articles from 43% to 59%. Increases in class size in statistics and econometrics courses may encourage instructors to use more current events and press readings to break up the lecture and engage students with relevant statistical examples. An increase in class size from 20 to 50 students in other upper-division field courses increases the probability that an instructor usually or always lectures from 55% to 73% and decreases the probability of incorporating computer lab activities from 29% to 18%. Additionally, the probability of using scholarly readings in other upper-division field courses falls from 81% to 63% when class sizes increase from 20 to 50 students. These class size effects are generally consistent with the results from Harter et al. (2015a),

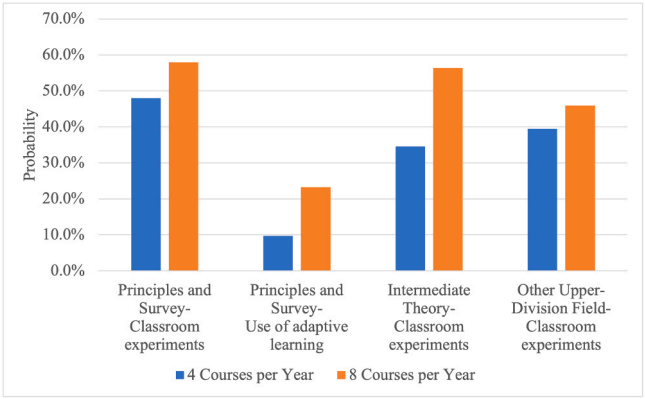

Fig. 3. Predicted Probabilities for Teaching Loads in Principles and Survey, Intermediate Theory, and Other Upper-Division Field Courses.

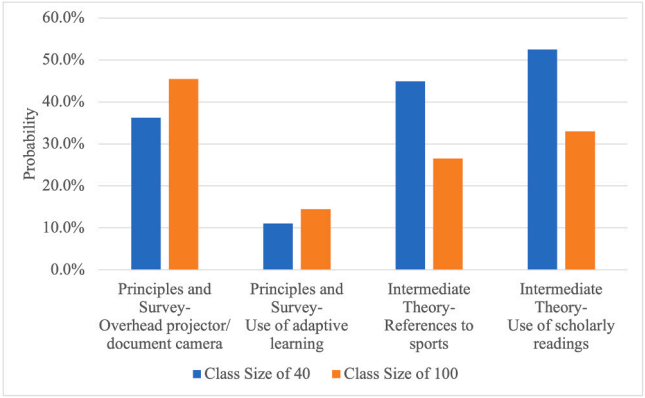

Fig. 4. Predicted Probabilities for Class Sizes in Principles and Survey and Intermediate Theory Courses.

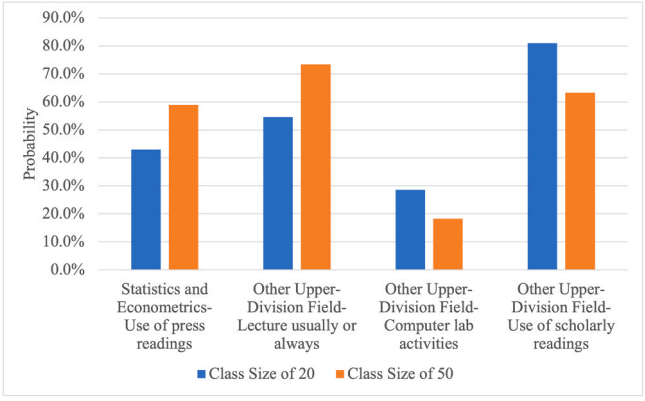

Fig. 5. Predicted Probabilities for Class Sizes in Statistics and Econometrics and Other Upper-Division Field Courses.

although our sample did include more instructors teaching other upper-division field courses. Also, other upper-division field course instructors in our sample had the lowest share of faculty usually or always using lecture. Moreover, the average class size for other upper-division field courses has increased by 22% from the mean other upper-division field course class size in the previous study. Increases in class sizes may have the strongest effects on other upper-division field course instructors who will shift instruction away from active learning teaching methods, such as computer lab activities, towards more lecture as a result.

5. Discussion and conclusion

Our results are consistent with prior findings that school, departmental, and instructor characteristics have differential effects on

teaching methods and materials across undergraduate economics courses. Lecture continues to be the predominant teaching method in undergraduate economics courses, although evidence suggests there has been an increase in the use of cooperative learning activities across all types of undergraduate economics courses (Asarta et al., 2021; Harter and Asarta, 2022). There is much variation in our findings across course types. Below we summarize our findings associated with school, instructor, and departmental characteristics and then discuss implications for the economics discipline.

The results examining Carnegie school classifications suggest that faculty teaching at baccalaureate institutions may be more inclined to use cooperative learning and press readings in classes above principles and survey courses relative to master's and doctoral school instructors. These results align with those of Harter et al. (2015a). In addition, our 2020 survey results reveal a new finding that faculty at baccalaureate and master's schools may be less likely than doctoral instructors to use adaptive learning systems in principles and survey courses. For this sample, we find that faculty at baccalaureate institutions, in general, are more likely to use student-centered teaching methods as compared to instructors at both master's institutions and doctoral institutions, and less likely to lecture all or most of the time as compared to instructors at doctoral institutions.

Our findings on instructor demographics align with results from the earlier study. Female faculty are less likely than male instructors to lecture all or most of the time and more likely to incorporate cooperative learning and press readings in their teaching. Instructors for whom English is their second language may use fewer cultural references to literature, drama, music, and sports compared to native English speakers. Non-native English speaking faculty may use adaptive learning materials more frequently in principles and survey courses than native English speakers. These results suggest that changing demographics and diversity among undergraduate economics faculty may have implications for the types of instructional methods and materials used in economics classes. For example, if female instructors tend to lecture less and use cooperative learning activities more than male instructors, an increase in the number of female economics instructors across all course types might increase students' engagement with and interest in economics. Research indicates that female students may be more inclined to take additional economics courses and pursue economics as a major when they perform better in introductory economics courses (Emerson et al., 2012; Ahlstrom and Asarta, 2019), and female students may also perform better in introductory economics courses that offer more active learning methodologies compared to more traditional instructional approaches (Ball et al., 2006; Emerson and Taylor, 2004). The underrepresentation of female economics faculty combined with the findings that they make different choices about teaching methods may contribute to the persistent gender gaps in male and female students' economics course persistence and major selection through indirect effects on student performance. Our results suggest the increased professional emphasis placed by the American Economic Association on building a more diverse, inclusive, and productive profession (AEA, 2020) may be our best hope for breaking the "tradition" of chalk and talk methods in undergraduate economics instruction.

While instructor experience is significant in fewer estimations compared to the prior work, our study reveals that, like Harter et al. (2015a), instructors with more experience tend to use classroom experiments less frequently. We also find that experienced instructors may be less likely to use sports references. Instructor experience is, perhaps, also a proxy for age, and our results are consistent with Denaro et al.'s (2022) finding that an instructor's teaching experience is not a significant determinant of using active learning methods in college science and math courses. It is possible that changes in teaching methods and materials over time are less associated with an instructor's experience and more associated with increased access for graduate students to instruction in pedagogy as well as school or university-offered professional development activities for faculty members. Such changes also offer hope for more diversity in teaching methods and materials in the future.

When examining departmental characteristics, we find higher teaching weights can result in an increased use of active learning techniques and engaging course materials. However, we observe fewer significant effects compared to the prior study. Furthermore, our results indicate average teaching weights have increased since the research using the combined study sample (Harter et al., 2015a, 2015b). Results show that higher weights on teaching in promotion and tenure decisions are associated with increased use of non-lecture teaching methods, but it is unclear whether this is the result of faculty who are more inclined to use these approaches matching with institutions that value it or a change in faculty behavior in response to changes in departmental incentives. Research confirming the lack of diversity in the profession (e.g., Bayer, 2021; Al-Bahrani, 2022) suggests the former.

In terms of the impacts of teaching load, unlike the findings in Harter et al. (2015a), we find positive correlations between the use of classroom experiments and higher teaching loads, although a smaller share of instructors use classroom experiments, on average. Economics instructors may not use classroom experiments because of the costs associated with preparing class materials and giving up valuable classroom time, while those who do may perceive the benefits are greater than the costs (Durham et al., 2007). Instructors with higher teaching loads may perceive there are spillover benefits from using classroom experiments if they are able to use similar experiments in multiple course types. If teaching loads continue to increase, this positive impact may become even more evident with increased use of student-centered teaching practices.

Our findings indicate changes in class sizes seem to continue to strongly influence an instructor's choice of teaching methods. Class sizes also vary considerably across course types. Our sample includes a larger share of instructors teaching other upper-division field courses than in Harter et al. (2015a), and we find that changes in class sizes have the strongest effects on this course type. Specifically, in other upper-division field courses, higher class sizes lead to more use of lecture and overhead projectors/document cameras and less use of scholarly readings. These results are consistent with research in STEM fields that suggests higher class sizes are associated with reduced instructor use of active learning methods and more use of lecture (Apkarian et al., 2021; Denaro et al., 2022). The effects of increasing class sizes may also be related to changing institutional environments. Prior to the COVID-19 pandemic, colleges and universities faced higher educational costs, increasing student enrollments, and challenges retaining students (Blankenberger and Williams, 2020). Our sample indicates average undergraduate economics class sizes have increased in all course types by about 13 – 42% relative to the mean class sizes presented in Harter et al. (2015a). The largest increases have been in principles and survey courses.

Larger class sizes may increase the opportunity costs associated with using student-centered teaching methods and may at least partially explain the persistence of "chalk and talk" in economics. It is worth noting, however, that recent research conducted by Boulatoff and Cyrus (2022) shows that active learning activities can be effectively delivered in large principles of economics courses by graduate or advanced undergraduate students, reducing the instructors' opportunity costs associated with using student-centered teaching methods in those large classroom settings.

Although the sixth quinquennial survey was administered prior to the COVID-19 pandemic, it is worth noting that changes in instruction resulting from the pandemic are likely to have strong effects on undergraduate economics course instruction in the future. For instance, the increase in online and hybrid courses or the increased use of Zoom and recorded lectures may represent permanent shifts in instruction. Future surveys and research will explore the extent to which the pandemic has affected undergraduate economics course instruction and will provide opportunities for "before and after COVID-19″ comparisons. Those comparisons will be critically important for understanding the evolution of the teaching of economics in our profession, as well as the effects of that evolution on student learning, since the pedagogical practices used by instructors during the COVID-19 pandemic have been shown to affect student learning outcomes (Orlov et al., 2021).

Declaration of generative AI in scientific writing

The authors did not use generative AI in the preparation of this manuscript.

CRediT authorship contribution statement

Laura J. Ahlstrom: Conceptualization, Methodology, Investigation, Data curation, Formal Analysis, Writing- Original draft preparation, Writing-Review and Editing, Visualization, Project Administration. **Cynthia Harter:** Conceptualization, Methodology, Investigation, Data curation, Verification, Writing- Original draft preparation, Writing-Review and Editing. **Carlos J. Asarta:** Conceptualization, Methodology, Investigation, Data curation, Verification, Writing- Original draft preparation, Writing-Review and Editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data Availability

Data will be made available on request.

Appendix

Table A1 presents summary statistics by Carnegie school classification for the independent variables in our analysis. Table A2 presents descriptive statistics for our dependent variables according to school Carnegie classification.

Table A1
Instructor and Departmental Characteristics by School Carnegie Classification.

	Baccalaureate	Master's	Doctoral
Variable	Mean (SD)	Mean (SD)	Mean (SD)
Female*	0.399 (0.491)	0.357 (0.481)	0.334 (0.472)
Lecturer	0.036 (0.186)	0.065 (0.247)	0.120 (0.326)
Assistant Professor	0.315 (0.466)	0.169 (0.376)	0.268 (0.443)
Associate Professor	0.244 (0.431)	0.292 (0.456)	0.199 (0.400)
Full Professor	0.405 (0.492)	0.474 (0.501)	0.413 (0.493)
English 2 L	0.131 (0.338)	0.182 (0.387)	0.177 (0.382)
Experience (in hundreds)	0.171 (0.127)	0.191 (0.113)	0.183 (0.129)
Teaching Weight	0.487 (0.181)	0.468 (0.207)	0.240 (0.185)
Teaching Load	5.345 (1.460)	6.338 (1.727)	3.969 (1.258)
Class Size	23.971 (6.310)	32.991 (16.987)	77.892 (85.950)
N	168	154	407

Notes: Standard deviations are displayed in parentheses. Since instructors reported an average institutional class size for all course types taught, we first calculated an average class size for each instructor. The institutional class size means and standard deviations were then compiled as an average of instructors' average class sizes. The full sample is 729 instructors.
* Respondents who identified as male or non-binary are coded as zero.

Table A2
Summary Statistics for Dependent Variables by School Carnegie Classification.

	Baccalaureate	Master's	Doctoral
Variable	Mean (SD)	Mean (SD)	Mean (SD)
Lecture usually or always	0.661 (0.475)	0.708 (0.456)	0.727 (0.446)
Cooperative learning	0.833 (0.374)	0.630 (0.484)	0.597 (0.491)
Overhead projector/document camera	0.298 (0.459)	0.468 (0.501)	0.484 (0.500)
Computer generated displays/PowerPoint	0.940 (0.273)	0.948 (0.223)	0.919 (0.273)
Team teaching	0.202 (0.403)	0.201 (0.402)	0.172 (0.378)
Computer lab activities	0.458 (0.500)	0.396 (0.491)	0.265 (0.442)
Classroom experiments	0.512 (0.501)	0.442 (0.498)	0.371 (0.484)
References to lit/drama/music	0.351 (0.479)	0.396 (0.491)	0.369 (0.483)
References to sports	0.411 (0.493)	0.506 (0.502)	0.354 (0.479)
Use of workbooks/study guides/tutorials (print or online)	0.244 (0.431)	0.481 (0.501)	0.329 (0.471)
Use of adaptive learning	0.125 (0.332)	0.201 (0.402)	0.174 (0.380)
Use of instructor notes	0.589 (0.493)	0.500 (0.502)	0.644 (0.480)
Use of instructor problem sets	0.905 (0.294)	0.740 (0.440)	0.823 (0.382)
Use of press readings	0.732 (0.444)	0.610 (0.489)	0.558 (0.497)
Use of scholarly readings	0.780 (0.416)	0.578 (0.496)	0.636 (0.482)
N	168	154	407

Notes: Standard deviations are displayed in parentheses. Instructors responded to questions for all course types they taught. The full sample is 729 instructors.

References

Ahlstrom, Laura J., Asarta, Carlos J., 2019. The gender gap in undergraduate economics course persistence and degree selection. AEA Pap. Proc. 109, 255–260.

Al-Bahrani, Abdullah, 2022. Classroom management and student interaction interventions: fostering diversity, inclusion, and belonging in the undergraduate economics classroom. J. Econ. Educ. 53 (3), 259–272.

American Economic Association (AEA)Best practices for economists: building a more diverse, inclusive, and productive profession 2020.https://www.aeaweb.org/resources/best-practices.

Apkarian, Naneh, Henderson, Charles, Stains, Marilyne, Raker, Jeffrey, Johnson, Estrella, Dancy, Melissa, 2021. What really impacts the use of active learning in undergraduate STEM education? Results from a national survey of chemistry, mathematics, and physics instructors. PLoS One 16 (2), e0247544. https://doi.org/10.1371/journal.pone.0247544.

Asarta, Carlos J., Chambers, Rebecca G., Harter, Cynthia., 2021. Teaching methods in undergraduate introductory economics courses: results from a sixth national quinquennial survey. Am. Econ. 66 (1), 18–28.

Ball, Sheryl B., Eckel, Catherine, Rojas, Christian, 2006. Technology improves learning in large principles of economic classes: using our WITS. Am. Econ. Rev. 96 (2), 442–446.

Bayer, Amanda, 2021. Diversifying economic quality. Am. Econ. Assoc. Comm. Status Minor. Groups Econ. Prof. http://diversifyingecon.org.

Becker, William, Kennedy, Peter E., 1992. A graphical exposition of the ordered probit. Econom. Theory 8 (1), 127–131.

Becker, William, Watts, Michael, 1996. Chalk and talk: a national survey on teaching undergraduate economics. Am. Econ. Rev. 86 (2), 448–453.

Becker, William, Watts, Michael, 2001. Teaching economics at the start of the 21st century: still chalk and talk. Am. Econ. Rev. 91 (2), 446–451.

Blankenberger, Bob, Williams, Adam, 2020. COVID and the impact on higher education: the essential role of integrity and accountability. Adm. Theory Prax. 42 (3), 404–423. https://doi.org/10.1080/10841806.2020.1771907.

Boulatoff, Catherine, Cyrus, Teresa L., 2022. Improving student outcomes in large introductory courses. Int. Rev. Econ. Educ. 41, 100247.

Ceci, Stephen J., Ginther, Donna K., Kahn, Shulamit, Williams, Wendy M., 2014. Women in academic science: a changing landscape. Psychol. Sci. Public Interest.: A J. Am. Psychol. Soc. 15 (3), 75141.

Chari, Anusha, Levenstein, Margaret, 2023. The 2022 report on the status of women in the economics profession. Newsl. Comm. Status Women Econ. Prof. 1, 10–35.

Chen, Xianglei, Carroll, C. Dennis, 2000. Instructional Faculty and Staff in Higher Education Institutions Who Taught Classes to Undergraduates: Fall 1992. U.S. Department of Education. National Center for Education Statistics, Washington, D.C.

Denaro, Kameryn, Kranzfelder, Petra, Owens, Melinda T., Sato, Brian, Zuckerman, Austin L., Hardesty, Rebecca A., Signorini, Adriana, Aebersold, Andrea, Verma, Mayank, Lo, Stanley M., 2022. Predicting implementation of active learning by tenure-track teaching faculty using robust cluster analysis. Int. J. STEM Educ. 9 (49), 1–21.

Durham, Yvonne, McKinnon, Thomas, Schulman, Craig, 2007. Classroom experiments: not just fun and games. Econ. Inq. 45 (1), 162–178.

Emerson, Tisha L.N., McGoldrick, KimMarie, Mumford, Kevin J., 2012. Women and the choice to study economics. J. Econ. Educ. 43 (4), 349–362.

Emerson, Tisha L.N., Taylor, Beck A., 2004. Comparing student achievement across experimental and lecture-oriented sections of a principles of microeconomics course. South. Econ. J. 70 (3), 672–693.

Goffe, William L., Kauper, David, 2014. A survey of principles instructors: why lecture prevails. J. Econ. Educ. 45 (4), 360–375.

Hall, Joshua C., Humphreys, Brad R., Pyun, Hyunwoong, 2017. An inventory of sports economics courses in the US. Int. J. Sport Financ. 12 (1), 3–13.

Harter, Cynthia, Asarta, Carlos J., 2022. Teaching methods in undergraduate intermediate theory, statistics and econometrics, and other upper-division economics courses: results from a sixth national quinquennial survey. Am. Econ. 67 (1), 132–146.

Harter, Cynthia., Becker, William E., Watts, Michael., 2011. Time allocations and reward structures for US academic economists from 1995 – 2005: evidence from three national surveys. Int. Rev. Econ. Educ. 10 (2), 6–27.

Harter, Cynthia, Schaur, Georg, Watts, Michael, 2015a. School, department, and instructor determinants of teaching methods in undergraduate economics courses. South. Econ. J. 81 (4), 1169–1188.

Harter, Cynthia, Schaur, Georg, Watts, Michael, 2015b. What do teaching weights tell us? J. Econ. Educ. 46 (3), 310–323.

McChesney, Jasper, Bichsel, Jacqueline, 2020. The aging of tenure-track faculty in higher education: implications for succession and diversity (Research Report). CUPA-HR (Available from). https://www.cupahr.org/surveys/research-briefs/.

Morton, Linda, Beard, Fred K., 2005. Faculty productivity and carnegie institutional characteristics within AEJMC programs. J. Mass Commun. Educ. 60 (2), 176–189.

Orlov, George, McKee, Douglas, Berry, James, Boyle, Austin, DiCiccio, Thomas, Ransom, Tyler, Rees-Jones, Alex, Stoye, J.örg, 2021. Learning during the COVID-19 pandemic: it is not who you teach, but how you teach. Econ. Lett. 202, 109812.

Schimanski, Leslie A., Alperin, Juan Pablo, 2018. The evaluation of scholarship in academic promotion and tenure processes: past, present, and future. F1000Res 7, 1605. https://doi.org/10.12688/f1000research.16493.1.

Sheridan, Brandon J., Smith, Ben, 2020. How often does active learning actually occur? Perception versus reality. AEA Pap. Proc. 110, 304–308.

Stevenson, Betsy, Zlotnick, Hanna, 2018. Representation of men and women in introductory economics textbooks. AEA Pap. Proc. 108, 180–185.

U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS). 2020.
Watts, Michael, Becker, William E., 2008. A little more than chalk and talk: results from a third national survey of teaching methods in undergraduate economics courses. J. Econ. Educ. 39 (3), 273–286.
Watts, Michael, Schaur, Georg, 2011. Teaching and assessment methods in undergraduate economics: a fourth national quinquennial survey. J. Econ. Educ. 42 (3), 294–309.