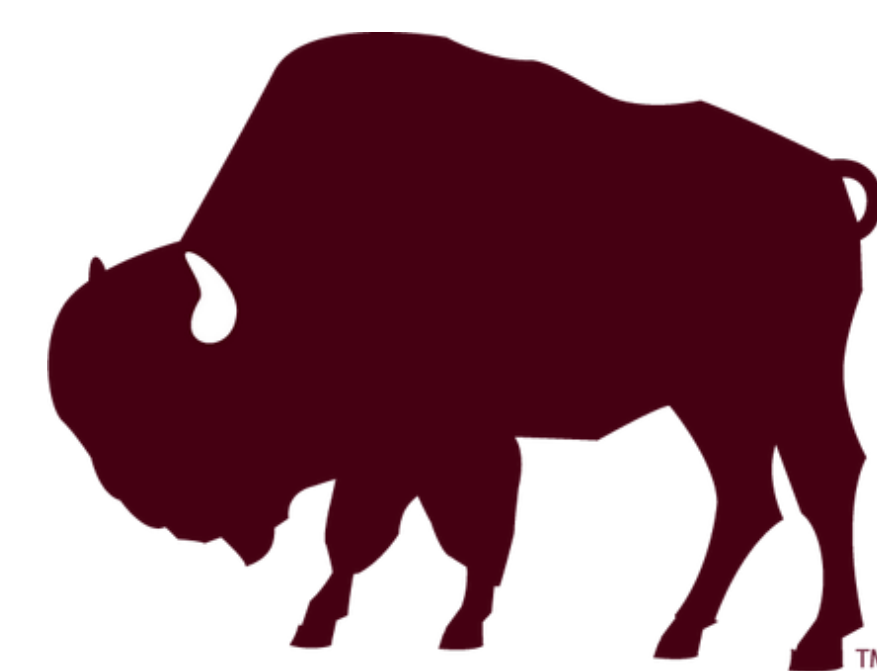




Enhancing Business Students' Learning Experiences Through a Hands-On Research Project Using Wharton Research Data Services (WRDS)

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Introduction

Through a practical research project, we investigated undergraduate business students' perceptions of the Wharton Research Data Services (WRDS) platform. Our study focused on assessing students' understanding of financial ratios using our developed pre and post-tests to gauge business majors' proficiency in calculating and analyzing financial ratios. To the best of our knowledge, this is the first study to assess the effectiveness of a project that requires face-to-face (F2F) and online students to use WRDS. We also created a new financial ratio scale to assess students' financial ratios and analysis knowledge. A post-test assessment was administered during the latter part of the semester. We concluded by addressing the students' benefits and challenges of utilizing the WRDS platform and a hands-on research project in F2F and online introductory finance courses. This study contributes to the limited research about student perceptions of a WRDS research project in finance courses.

Description of the Project

We taught four *FIN 3320 Business Finance* sections during the 2022 fall semester, had the same learning objectives, and administered the same hands-on project using the WRDS platform. We selected five companies from various industries (e.g., energy, consumer discretionary, telecommunications) for each online course. We assigned one publicly traded company to students based on their last name; therefore, eight to ten students received the same company.

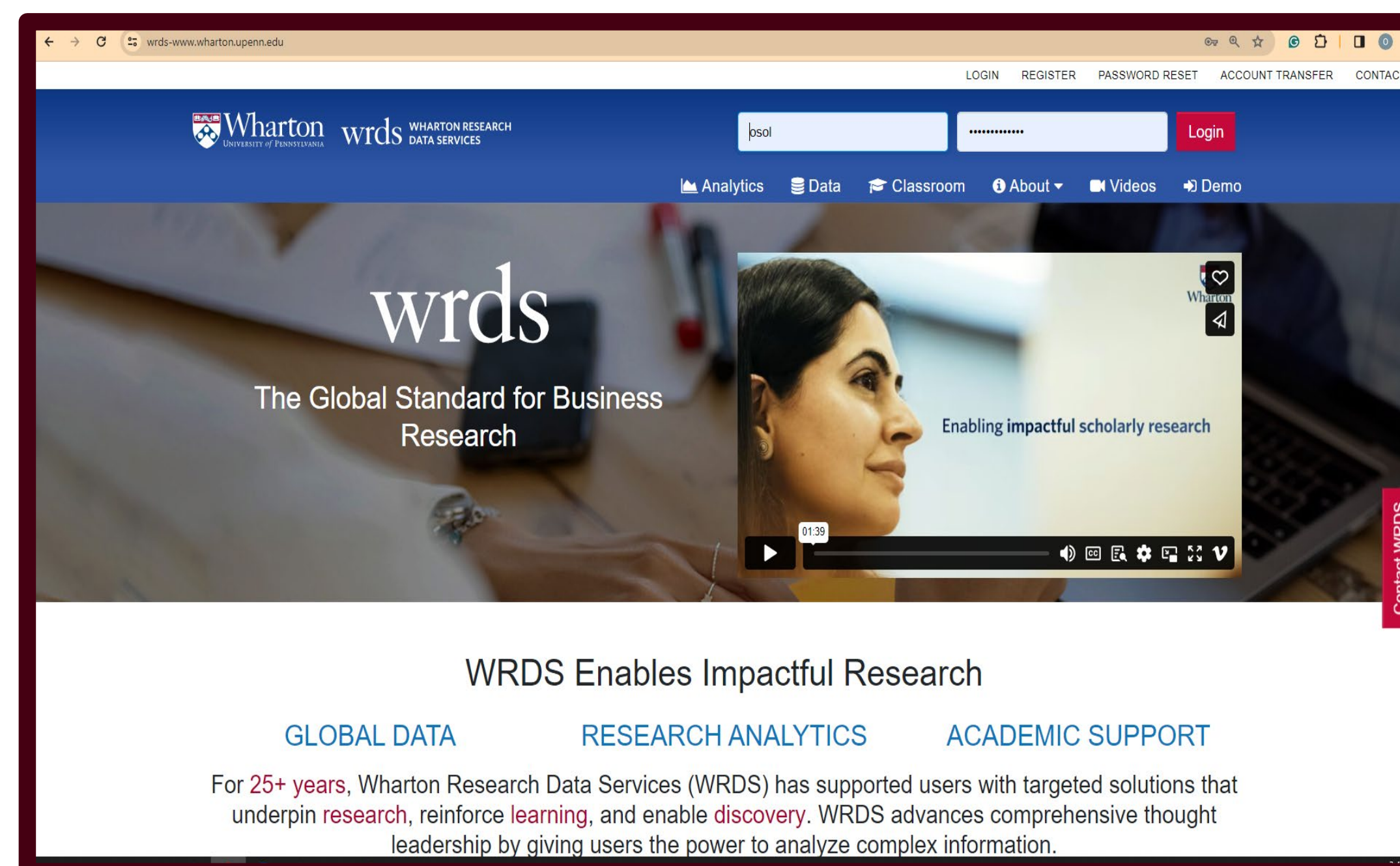
Steps for Students

1. Students set up a WRDS account.
2. Students were encouraged to review the WRDS tutorial videos that we provided. The videos were available on the Blackboard course site for each online course, and students were instructed on navigating the WRDS websites, extracting financial statements from the database, and accessing industry-average information.
3. Students used the company's ticker symbol (for example, WMT for Walmart) to access the financial statements and download the data using Microsoft Excel.
4. Students calculated and analyzed ten financial ratios about liquidity, leverage, efficiency, and profitability for the company's past three years (2019-2021).
5. Students were instructed to write a three-to-five-page report, including the company background, calculations, and analysis of ten common financial ratios and an industry average comparison.
6. Students had between four and seven weeks to complete the project, and we graded the project based on calculations, financial analysis, grammar, and formatting and provided grades and thorough feedback to students within two weeks. The project was worth 15% of the overall course grade.

Methods

The online pre-test survey included 17 demographic and academic information questions and a Financial Ratio Scale of 10 questions. The online post-test survey included 10 Financial Ratio Scale questions, 11 questions about the experience with WRDS, and three open-ended questions about WRDS. The questions were derived from our experience teaching finance courses and the previous implementation of a WRDS survey in the 2021-22 academic year. This study is Institutional Review Board (IRB)-approved.

During the fall 2022 semester, 173 undergraduate students, ages 18 and older, enrolled in introductory finance courses at a regional public university. One instructor taught two *FIN 3320 Business Finance* sections F2F, with 37 students in one section and 34 students in the second section. Another instructor taught two online sections with 53 students and 49 students enrolled. In the first week of classes, the instructors recruited participants from the four introductory finance courses to complete the pre-test online survey hosted by Qualtrics. The pre-test online survey cover page informed students of the purpose of the study, asked for consent, and was open for one week. The post-test online survey was opened for four weeks in the latter part of the fall semester to accommodate the different due dates for the WRDS financial ratio-based assignments in the F2F and online sections.



Demographics

One hundred and thirty-eight undergraduate students completed the survey, yielding a response rate of 79.77%. Sixty-five (47.1%) of the 138 participants were male and 73 (52.9%) were female. Thirty-one participants were finance majors, and 107 (77.5%) were non-finance majors. The undergraduate students were mostly juniors (56.5%) followed by seniors (34.8%), and the smallest group was sophomores (12.3%). See *Table 1*.

Table 1. Demographics of Students (N=138)

	Number	Percentage of Total
Male	65	47.1%
Female	73	52.9%
Finance Majors	31	22.5%
AEF Majors	59	42.7%
Non-AEF Majors	79	57.2%
High GPA	103	74.6%
Low GPA	35	25.4%
Age 22 or below	76	55.5%
Age 23 or above	62	44.5%
Senior	48	34.8%
Junior	78	56.5%
Sophomore	12	8.7%
Face-to-Face	59	42.8%
Online	79	57.3%
Transfer	96	69.6%
Not Transfer	42	30.4%
Working	97	70.3%
Not Working	41	29.7%
First Generation	62	44.9%
Not First Generation	76	55.1%
Prior WRDS Experience	12	8.7%
No Prior WRDS Experience	126	91.3%

Findings

In *Table 2*, students reported the two highest means for the WRDS project utilized the analytical skills (4.377) and critical thinking skills (4.420). The lowest mean students reported was communication skills (3.856).

Table 2. Students' Report on Learning Assessment (N=138)

Learning Assessment	1	2	3	4	5	Mean	SD
I gained a more in-depth understanding of financial ratio analysis through the WRDS assignment	0	3	11	59	65	4.348	0.721
The WRDS assignment utilized my problem-solving skills	0	4	9	66	59	4.304	0.721
The WRDS assignment utilized my analytical skills	1	1	9	61	66	4.377	0.707
The WRDS assignment utilized my communication skills	1	6	43	50	38	3.856	0.901
The WRDS assignment utilized my critical thinking skills	0	1	6	65	66	4.420	0.614
The WRDS assignment helped me develop specific skills, competencies, and points of view needed by professionals in business	0	2	13	63	60	4.312	0.702

Note: The scale ranged from Strongly Disagree (1) to Strongly Agree (5)

Findings (cont.)

In *Table 3*, students improved on all ten financial ratio assessment questions, scoring about 80% on the post-test versus 59% on the pre-test. Their improvement overall and on each question was statistically significant.

Table 3. Post-Test Results (N=138)

Question	Post-Test Percent Correct	Pre-Test Percent Correct	Difference
Q1	0.91	0.71	.20 (0.000)***
Q2	0.99	0.66	0.33(0.000)***
Q3	0.89	0.75	0.14 (0.002)***
Q4	0.65	0.45	0.20 (0.004)***
Q5	0.92	0.78	0.14 (0.002)***
Q6	0.70	0.28	0.41 (0.000)***
Q7	0.74	0.40	0.35 (0.000)***
Q8	0.80	0.45	0.35 (0.000)***
Q9	0.81	0.74	0.07 (0.059)*
Q10	0.58	0.45	0.13 (0.031)**
All Questions	0.799	0.567	.231 (0.000)***

P-values appear in parentheses below the coefficient estimates. *, **, *** indicate significance at 10%, 5%, and 1% respectively.

Benefits and Challenges

Students were asked two open-ended questions. The first question was "What benefits do you feel you received from using WRDS?" The responses relating to the identified theme of the challenges were captured in the following categories: (1) better understanding of ratios and finance; (2) gained hands-on experience with real-world data; (3) improved communication, research, and analytical skills; and (4) experience using a financial database. Selected examples of student's comments supporting this theme are as follows:

- I was able to get a much clearer picture of how the financials tied together to give a better understanding of the health of the business especially when compared to others in the same industry.
- My critical thinking skills have definitely enhanced and my overall knowledge of finance in the real world as a whole.
- I received a deeper understanding of the ratios. The ratios went from simple equations to almost tangible concepts that helped me visualize the status of a firm.

The second question was, "What challenges did you face using WRDS?" The responses relating to the identified theme of the challenges were captured in the following categories: (1) understanding finance and finance ratios; (2) calculation, interpretation, and analysis of ratios; (3) Excel, data collection and navigating throughout the WRDS website; and (4) communication (writing) of information. Selected examples of student's comments supporting this theme are as follows:

- It was difficult at times explaining how all the ratios were affected by the financial statements and what that meant. I had to look back on class notes and do some research to help answer some of the questions.
- WRDS challenged my analytical and critical thinking skills.
- Ensuring accurate calculations and interpreting the position and performance of management.

Discussion

Students reported that they were generally positive towards WRDS and the hands-on project, and the WRDS project tested them on learning outcomes. We highlighted instructional strategies and provided evidence supporting the incorporation of the WRDS platform in introductory finance classes with many non-majors. The WRDS project described in this poster supports developing and strengthening students' skill sets for upper-level courses and career development.

The benefits for online instructors include: (a) providing students with a hands-on experience; (b) utilization of a financial database; (c) providing a more interactive and engaging online course with real-world application; and (d) strengthening students' transferable skills, (e.g., analytical, communication, critical thinking skills, etc.) for upper-level courses and future careers. From experience and the research evidence, the benefits of incorporating the project using the WRDS platform outweigh the challenges students and instructors face.