

INTRODUCTION

- Data analytics and interpretation are critical components in healthcare and pharmaceutical services research.
- A new course in SAS programming was created for doctoral (PhD) students in a Social and Administrative Sciences department at a School of Pharmacy.



Figure 1: Uses of data in healthcare

OBJECTIVE

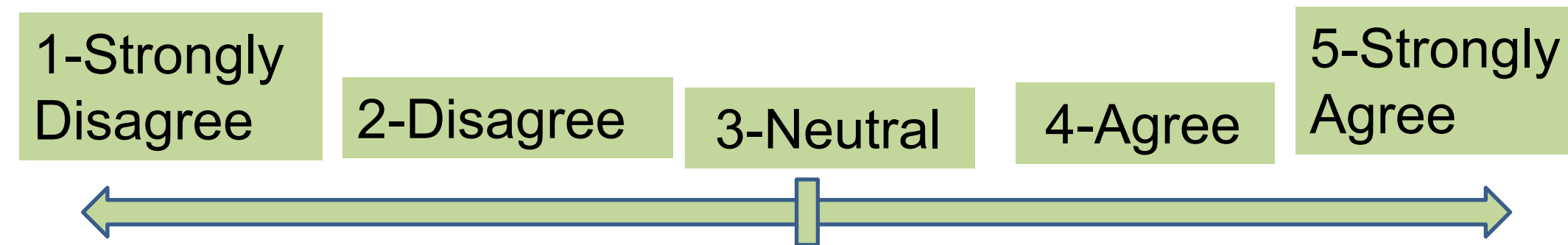
- We assessed student perception of knowledge and self-efficacy to apply SAS programming skills and how it impacted learning outcomes.

METHODS

- The course was offered as 1 credit in 2022 (N=4) and 2 credits in 2023 (N=2).

METHODS (CONTINUED)

- Each class session was divided into two parts:
 - Didactic instructions and
 - Active learning with pre-written SAS programs
- Student learning was assessed using 5 sequential assignments and a final project
- Student perception about the course was assessed using:
 - Pre and post test and
 - Post survey with a 10-item Likert scale



- Results were compared quantitatively and qualitatively between the 2022 and 2023 cohorts.

RESULTS

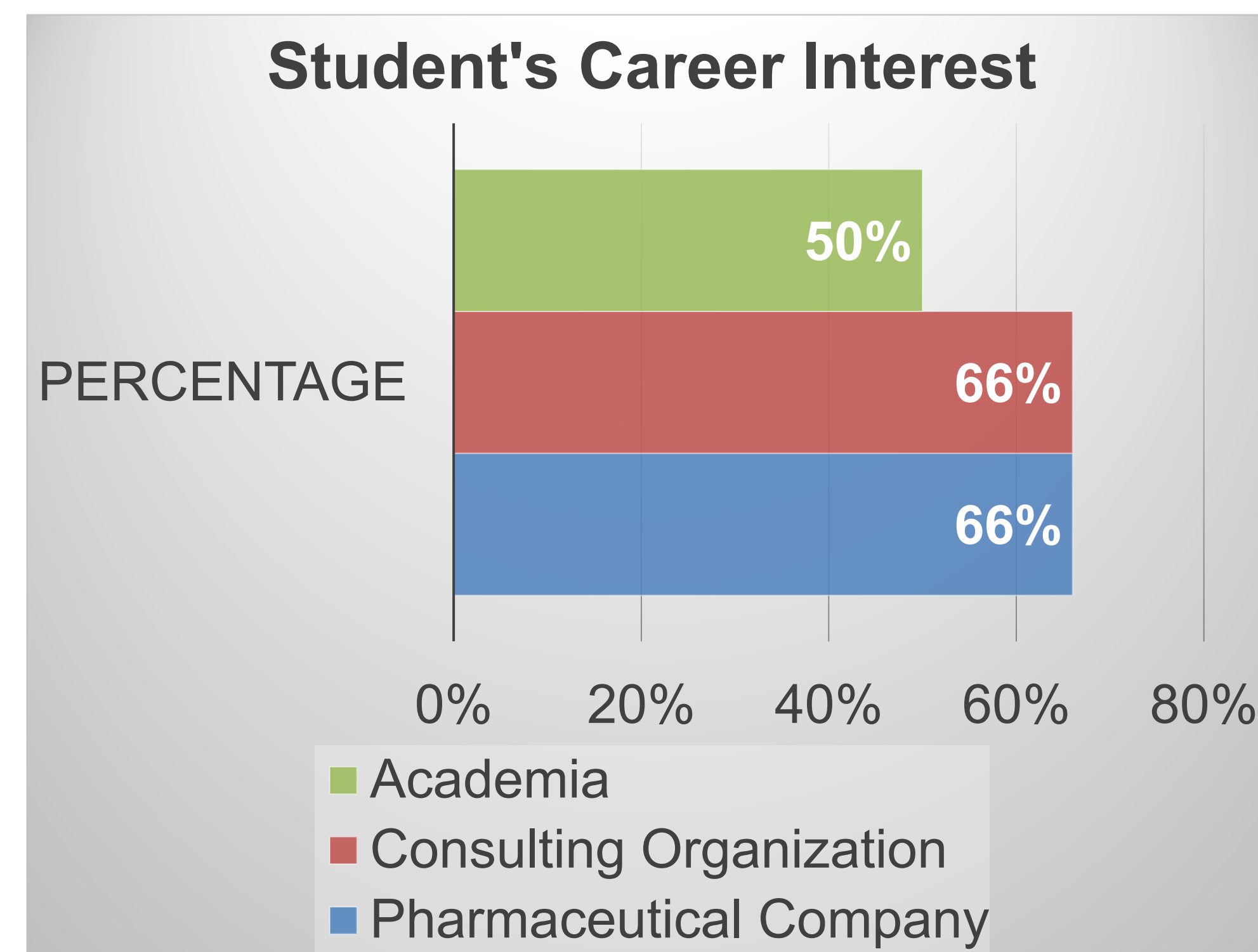


Figure 2: Career interest of students taking the course

RESULTS (CONTINUED)

Table 1: Median Score for each Survey Items

Survey Items	Median (First year)	Median (Second year)
1. I had very little knowledge of SAS programming before taking this course	3	5
2. The course has increased my knowledge of SAS programming	4	5
3. The course has increased my knowledge about the use of SAS analytical software for data processing	4.5	5
4. The assignments in the course helped me better understand the course materials	4.5	5
5. The final project in the course makes me confident that I can use SAS analytical software package	4.5	4.5
6. I see the value of SAS programming as a tool for health science research	5	5
7. I feel confident that I can manipulate and clean raw data to generate a final analytical data set	5	4.5
8. I feel confident that I can describe and summarize data	4.5	4
9. I feel confident that I can identify and apply appropriate methods for inferential statistics	4.5	3.5
10. I feel confident that I can interpret and report results obtained from data analysis	4.5	3.5

- Students felt that the assignment and SAS demonstration in class helped their learning the most in both years.

RESULTS (CONTINUED)

- Students in 2022 suggested that based on assignments and class content, credit should be increased.
- In 2023, students suggested to add more assignments that could resemble the final projects.

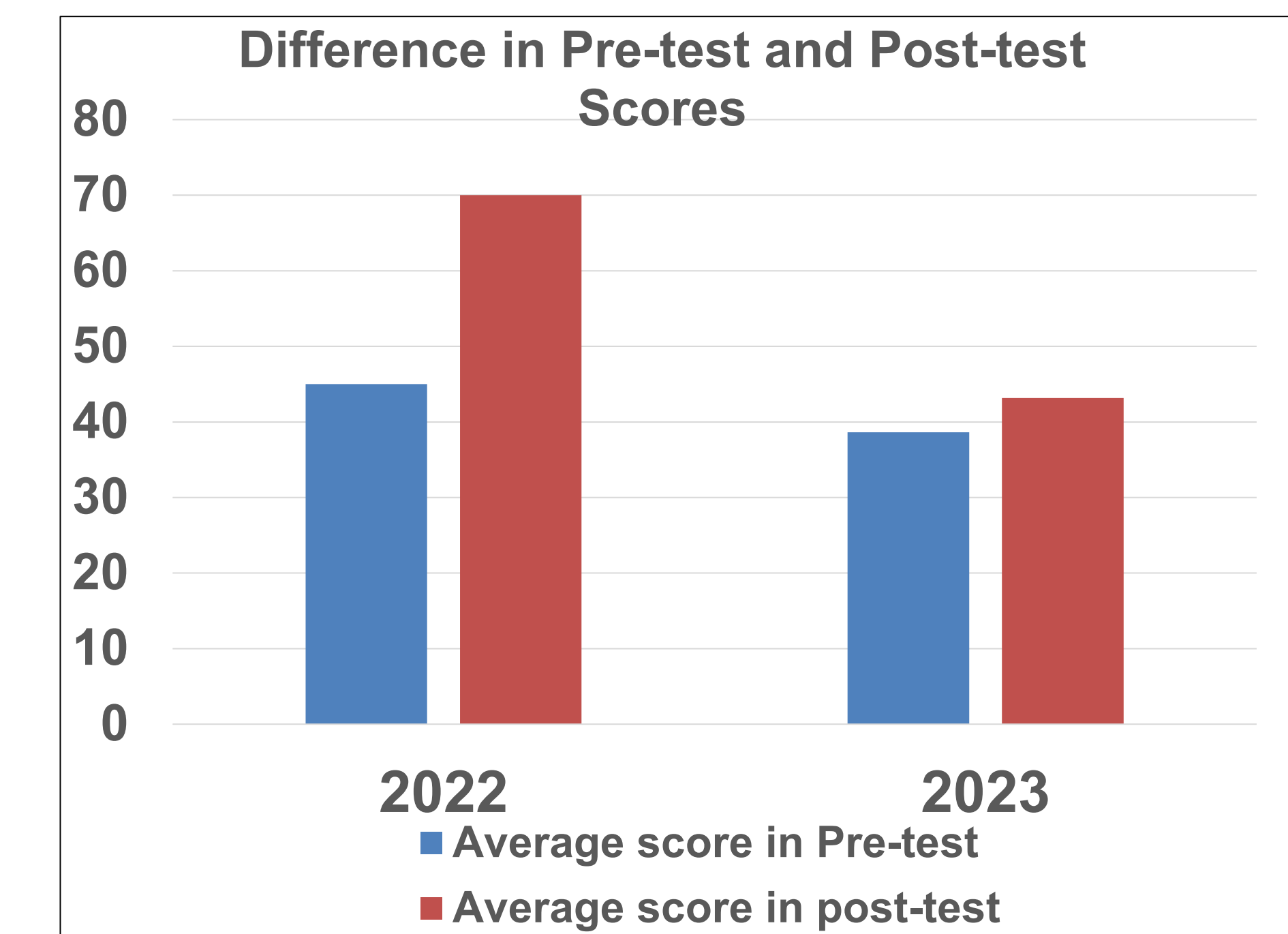


Figure 3: Difference in pre-test and post-test scores for students in 2022 and 2023

CONCLUSIONS

Introduction to SAS, offered as a 2-credit course, resulted in better learning than when offered as a 1 credit course. Introductory courses that aim to impart practical skills to students should be allotted sufficient credit hours for active learning.