Lab School Sentiment Among First and Second Year Education Majors

Sara E. Taylor

Northwest Missouri State University, Maryville MO 64468, USA
staylor@nwmissouri.edu

Abstract. The under-18 population decline combined with the decline in college enrollment for 18-24-year-olds has colleges taking a hard look at their strategies for recruitment and retention. This project explores one possible recruitment and retention strategy for education majors at a Midwest university, a laboratory school. The open-ended responses indicate a strong positive sentiment when asked about the influence of the lab school on the decision (recruitment) to attend or continue attending (retention). The top 3 words in recruitment are school, experience, and classroom, and in retention, they are teacher, classroom, and student. Polarity was used to determine the top 3 responses in each dataset. This analysis is one component of a larger project examining the influence of the lab school on recruitment and retention.

Keywords: lab schools · sentiment analysis · higher education · recruitment and retention
The Python notebooks used for this project are available at Github

1 Introduction

According to the National Center for Education Statistics, the college enrollment rate has decreased three percent over the last decade [2]. Over the last 20 years, one Midwest state has seen the percentage of the population under 18 decline from 25.5 to 22.4 [1]. The population decline combined with the decline in college enrollment for 18-24-year-olds has colleges taking a hard look at their strategies for recruitment and retention.

This project explores one possible recruitment and retention strategy for education majors at a Midwest university, a laboratory school. The lab school operates multiple classrooms on the first floor of the education building for children ages six weeks to sixth grade. As early as the first semester in college, teacher candidates observe in the lab school.

Each fall, starting in 2020, a brief five-question survey is distributed to education majors in the first education course and the third course (generally taken in the fall of the sophomore year). Each survey contains one open-ended response question, with a slight variation to obtain data on recruitment or retention:

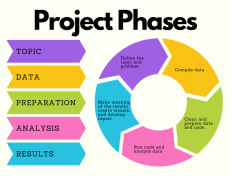
– **Recruitment:** Please elaborate on the ways in which the lab school influenced your decision to attend.

– **Retention:** Please elaborate on the ways in which your lab school experience influenced your decision to continue attending.

The open-ended responses create language-rich data; this project focuses on using sentiment analysis to synthesize four years of data.

2 Methodology

This project utilized five phases: topic, data collection, data preparation, analysis, and results. The first phase was the most difficult: narrowing the topic and identifying a problem. Figure 1 illustrates the subsequent project phases.



2.1 Data Collection

From Fall 2020 - 2023, an email was sent to all instructors of a freshman education course and a sophomore education course, asking them to send a scripted email to their students, which includes a link to a 5-question survey. The survey contains two Likert scale questions, catalog year, program of study, and one open-ended question. The same questions are used each year, with slight differences in the wording based on the target audience.

Freshman students are asked a series of questions to review the impact of the laboratory school on the recruitment of education majors.

1. Prior to attending (University Name), I was aware of the lab school (preschool to grade 6) on campus. (Yes/No; a 'no' response skips to question 4)
2. The opportunity to observe and teach in the (Lab School) positively influenced my decision to attend (University Name). (Likert Scale)
3. Please elaborate on the ways in which the lab school influenced your decision to attend (University Name). (Open-Ended)
4. As of today, I plan to teach students in (Multiple Choice)
5. Registration Catalog Year (Multiple Choice)

Sophomore students are asked a series of questions to review the impact of the laboratory school on the retention of education majors.

1. I have participated in an observation or lesson at the lab school (Yes/No; a 'no' response skips to question 4)
2. My experience in the (Lab School) positively influenced my decision to continue as an education major at (University Name). (Likert Scale)
3. Please elaborate on the ways in which your lab school experience influenced your decision to continue attending (University Name). (Open-Ended)

4. As of today, I plan to teach students in (Multiple Choice)
5. Registration Catalog Year (Multiple Choice)

At the end of each data collection cycle, semi-structured anonymous data was downloaded from the online survey host and stored as an Excel file.

2.2 Preprocessing

The survey data has been collected annually for four years from both the freshman and sophomore education majors.
The recruitment data set (freshman data) is defined according to the table below:

Column Name	Description	Data Type
Year	Survey completion year	String
Q1 Awareness	Yes/No: indicating if the student was aware of the lab school before attending.	Integer
Q2 Influence	Likert scale: the opportunity to observe and teach in the Lab School positively influenced my decision to attend.	Integer
Q3 Recruitment OE	Please elaborate on the ways in which the lab school influenced your decision to attend	String
Q4 Program	Program of study	Integer
Q5 Catalog	Catalog year	Integer

The retention data set (sophomore data) is defined according to the table below:

Column Name	Description	Data Type
Year	Survey completion year	String
Q1 Awareness	Yes/No: indicating if the student had an experience in the lab school	Integer
Q2 Influence	Likert scale: My experience in the LEET Center/ Horace Mann positively influenced my decision to continue as an education major.	Integer
Q3 Recruitment OE	Please elaborate on the ways in which your lab school experience influenced your decision to continue attending	String
Q4 Program	Program of study	Integer
Q5 Catalog	Catalog year	Integer

The data required compilation, missing data cleaning, and dummy coding before conducting the analysis. The recruitment data set (freshman data) and the retention data set (sophomore data) were given an additional column to reflect the year the data was collected. Then "Go to special" was used to select the blank cells and then fill with -1. Cells with blanks were coded -1 to allow for the creation of dummy codes for quantitative analysis. The Statistical Package for the Social Sciences (SPSS) software was used to further process the data sets.

Questions 1, 2, 4, and 5 were coded according to the table below:

Question	0	1
1	no	yes
2	neutral, "somewhat disagree", and "strongly disagree"	"somewhat agree" and "strongly agree"
4	middle and secondary	early childhood, elementary, special education, and K-12
5	unexpected catalog year	expected catalog year

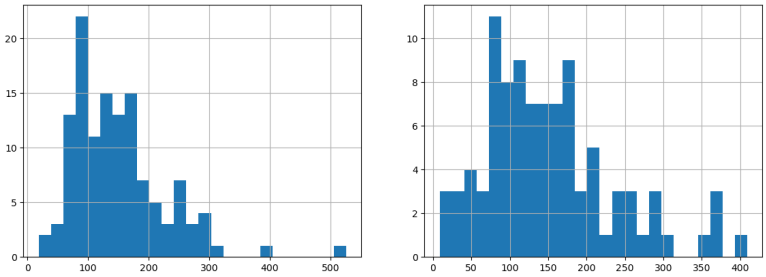
Each data set was merged into a single Excel worksheet for further quantitative and sentiment analysis. The recruitment data set has 221 rows, 6 columns, and 126 open-ended responses. The retention data set has 250 rows, 6 columns, and 96 open-ended responses. Survey responses that lacked an open-ended response were dropped from the data for the sentiment analysis.

2.3 Sentiment Analysis

For this study, the focus is on open-ended responses. Students were asked to describe the ways in which the lab school influenced their decision to attend or continue attending the university. Through the use of TextBlob [3], the sentiments of the responses were analyzed for polarity and subjectivity. The scores lie between "[-1,1]," and the combination is used to determine sentiment ('positive', 'neutral', or 'negative').

3 Results and Analysis

The histograms below show the character length of each data set's open-ended responses.

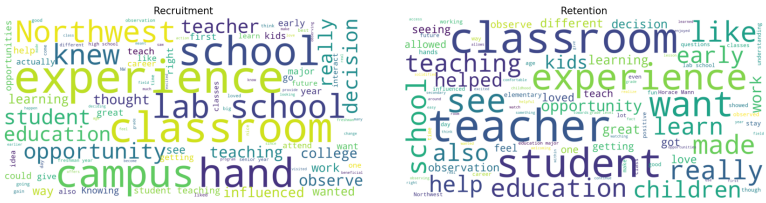


(a) Recruitment (b) Retention

Fig. 1: Open-Ended Response Lengths

Special characters, Twitter handlers, digits, multiple blank spaces, and single characters were removed to prepare for analysis. NLTK Stopwords was used to remove the 'english' stopword list and ['would', 'get', 'able','ha', 'wa', '-']. A word cloud was generated to visualize the words used to describe the lab schools' impact on the respondent.

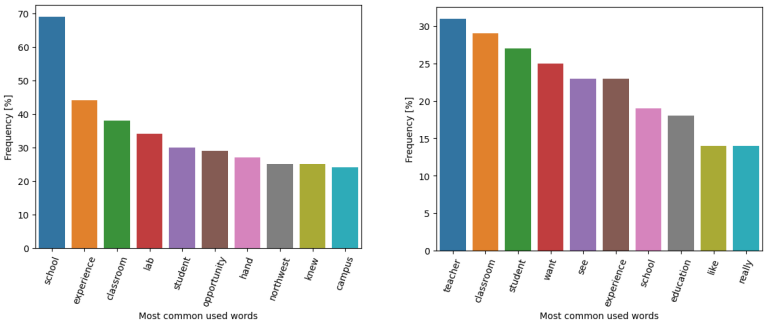
The word cloud helped identify additional stop words such as 'would', 'get', and 'able' that were frequent but, lack meaning on their own. A Lemmatizer



(a) Recruitment (b) Retention

Fig. 2: Word Clouds

function was used to look at the most commonly used words. The top 3 in Recruitment are school, experience, and classroom. The top 3 in Retention are teacher, classroom, and student. The figures below show the frequency of the top 10 words used to describe the influence of the lab school on a student's decision to attend or return to the university.



(a) Recruitment (b) Retention

Fig. 3: Top 10 Word Frequency

Using the TextBlob calculated polarity, the responses were classified as positive, neutral, or negative. As shown in the table below, the sentiment of the open-ended responses were overwhelmingly positive across both datasets.

Sentiment	Recruitment	Retention
Positive	103	83
Neutral	17	11
Negative	6	2

The top 3 Recruitment Responses (based on Polarity)

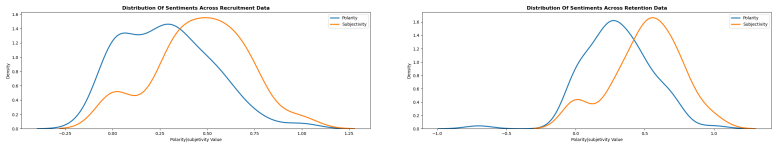
1. The lab school influenced my decision to attend the university because I knew that I would be given the wonderful opportunity to teach and observe

its students, learning about each of them, being a part of their learning, and improving my teaching skills.
2. The lab school impacted my decision to attend the university, because I knew it would get me the best education and let me have a hands on learning opportunity.
3. It is a great and convenient way to gain experience and utilize what is being taught in the course classes.

The top 3 Retention Responses (based on Polarity)

1. It is great experience! Everyone I know loves it.
2. It was a great experience to get some hands on training and experience. I learned lots and loved my experience.
3. I saw that I loved learning and being around the children. It showed me and solidified the fact that being a teacher is truly what I want to do.

The figure below shows the distribution of sentiments across the data



(a) Recruitment (b) Retention

Fig. 4: Sentiment Distributions

4 Conclusions

When asked about the influence of the lab school on the student's decision to continue attending the university, they point to the influence of the students, teachers, and classrooms in the lab school. Sentiment analysis across education majors shows that 82% and 86% of open-ended responses from the recruitment and retention data sets were positive. The open-ended responses provide each student's unique perspective; this type of analysis provides a new way to synthesize the data in this longitudinal study.

4.1 Limitations

This study takes place at one Midwest institution. Another limitation is the voluntary survey responses, which means not all education majors are represented in the sample. It is also important to note that the world grappled with the coronavirus pandemic during data collection. In March 2020, the campus closed, and when it returned in the fall, observations in the lab school were limited. This skews data collected in 2021, but it was important to include.

4.2 Future Work

Future work will include a quantitative analysis of the responses to look for correlations. Since the survey contains skip logic, only some responses include an open-ended response. In addition, lab schools worldwide have reached out to run the survey questions at their institution. The expansion of the project across multiple universities will create more generalizable results.

References

1. Bureau, U.S.C.: How has our nation's population changed? Tech. rep., United States Department of Commerce (2023), https://www.census.gov/library/visualizations/interactive/how-has-our-nations-population-changed.html
2. for Education Statistics, N.C.: Condition of education: College enrollment rate. Tech. rep., U.S. Department of Education, Institute of Education Sciences (2023)
3. Loria, S.: Textblob. Tech. rep. (2020), https://textblob.readthedocs.io/en/dev/quickstart.html