

Using Qualitative Data Analysis Software to Develop Occupational Understanding

Abstract

Employers report a gap in the skills recent graduates purport to have and skills they can articulate or demonstrate on the job. Students suggest that colleges do not prepare them well for workplace expectations. Using NVivo Qualitative Data Analysis Software (QSR, 2020) Management students are introduced to the qualitative data analysis tool while developing occupational understanding through an analysis of LinkedIn job postings. The paper premise provides an opportunity for colleges and students to better align expectations for 1. Clarity, 2. Understanding, and 3. Confidence. This ‘exercise overview’ can help faculty interested in implementing a value-added activity to a course.

Keywords: (3) qualitative data analysis, occupational understanding, workforce curriculum

- Paper Track: "Bridges" Track
- Session Format: (60 minute virtual) Experiential Exercise
- Level of Proposal: New to experiential learning

Introduction

There is a disconnect between what employers expect from new hires and what students believe they need to know to be successful in the workforce. A recent study by the Association of American Colleges & Universities (AAC&U) found that while 93% of employers believe that a liberal education is important for job success, only 42% of students believe that their college experience is preparing them for work (AAC&U, 2013).

One issue is that students do not always have a clear understanding of what employers are looking for in new hires. Research indicates that individuals from lower socioeconomic or with lower parental educational attainment are more likely to have trouble interpreting which skills might be needed in different fields and are less likely to ask questions when they don't know (Lareau, 2011; Goldsmith & Coleman, 2022).

The language of the business analytics field is one such example. In today's technologically pervasive workplaces, employers have an immediate demand for analytical and problem-solving skills. Analytics is defined as "the systematic computational analysis of data or statistics," but the term means different things to different people within the field (Davenport & Harris, 2007, p. 3). To further complicate matters, the field of data analytics is constantly evolving, making it difficult for even experienced professionals to keep up with the latest trends and tools (Mayer-Schönberger & Ramge, 2018). As a result, students who are interested in data analytics often have trouble identifying which skills they need to develop.

This exercise is structured to give students a chance to develop basic data analytics skills as they collect, clean, analyze, and share data. Students perform their analysis using a qualitative data analysis tool NVivo (QSR). Students are assigned one investigation point, 'years of experience requested by employment level', however they tend to self-select additional points based on their interest. By understanding the years of experience needed for occupation students can assess their own

experiential readiness. The result is that students really understand the expectations of potential occupations.

Theoretical Foundation and Teaching Implications

Our activity is suitable for online and in-person classes targeting undergraduate, graduate, and professional students. This exercise offers an easy-to-implement exercise to educate students about problem solving and building careers. In the management field, faculty may best leverage this exercise during lessons focusing on career development and problem solving.

NVivo (or similar qualitative data analysis tools) provided an efficient means for participants to manage and categorize the different types of information included in their data sets, job descriptions that met the stated criteria. This project would not only introduce students to a text mining tool but also expose them to a detailed examination of the current employment landscape of their field of study.

When it comes to developing a career, self-efficacy can be a make-or-break factor. Self-efficacy is defined as "a person's belief in their own ability to complete tasks and achieve goals" (Kezar, et al, 2020). In other words, it's your confidence in your ability to succeed at a given task or reach a certain goal. When it comes to career development, self-efficacy can be broken down into three main dimensions:

1. Occupational information: This encompasses your knowledge of the skills and requirements needed for a particular job or career.
2. Career planning: This refers to your ability to set and achieve goals related to your career.
3. Career self-appraisal: This is your ability to critically assess your own skills and accomplishments and identify areas for improvement.

Students develop a better understanding of the skills and requirements needed to be successful by gaining first-hand knowledge of what a particular job or career entails.

Learning Objectives.

Faculty who participate in the session will learn:

1. How to teach basic data analysis skills
2. Learn about an impactful qualitative research tool
3. Consider how to link college to career for their students

Exercise Overview

Here is an overview of the assignment from the student perspective for a 16-week term.

The student is first exposed to course expectations and acclimated to the class in weeks one and two. During these weeks, it will be important to cultivate a climate of exploration and learning. Without previous knowledge of qualitative data analysis software or its text-mining ability, students must be reassured that they are not being graded on their proficiency with the software but in their exploration of the tool and the employment landscape of their intended field. The project takes approximately 8-weeks to complete, depending on how much time is devoted to in-class project time. If students are not given in-class time to explore the software, they may procrastinate due to feeling overwhelmed by the new technology.

Instruction videos are embedded in the project and instructions are provided via a PowerPoint deck. These are shorter than 10 minutes each and walk participants through the necessary steps of navigating the project. You will have to point these videos out repeatedly because students might engage with the project at different times and will feel like they did not have enough instructions even though the videos were linked, they forgot and did not return to the step-by-step instructions. This can result in unnecessary frustration and lack of engagement with the project.

Instructions

Step 1: Introduction to software and overview of project . (Week(s) 1-2)

The exercise begins with instructors introducing the project.

Student Learning Objectives.

After completing the exercise and reflection, students will be able to:

1. Demonstrate basic data analysis skills: collect and clean a data set, organize information for analysis, perform basic analyses, and share information with data visualizations.
2. Demonstrate novice level proficiency with QDAS tool.
3. Identify the skills required in the occupation under study
4. Understand employer experience expectations in the occupation under study

We've done the exercise with two sections of 12 and 14 students in face-to-face sessions. The activity lends itself to small group activities and can be done on-line. The guidelines can be delivered orally, and in writing via a PowerPoint slide deck (Appendix A). I recommend providing videos of the critical steps so students can easily locate the exact information they need instead of searching the internet for videos that may not apply to the task. Ideally, the instructor should be able to answer questions about the assignment and the software, but it is not necessary. If the instructor is not proficient in the software inform students that after the meeting, the instructor will redirect software questions to the manufacturer training support. Though this causes some consternation among the students, it is important to explain that supervisors who issue job asks are not always going to be software experts. Remind them that they are not being graded on their software expertise but on their software exploration which requires following all the directions provided.

After that, questions usually pertain to how the project is organized, such as:

- Can I get jobs from another place? (I don't have a LinkedIn account)
- Can I work alone/in a team?
- Can I do any occupation or industry?
- Where am I supposed to learn how to use the software?

Instructors should think in advance about what they might accept. Uniformity in the assignment makes reviewing the content with the student easier. For example, if students use a platform other than LinkedIn, additional instructions may be needed to identify similar parameters. Similarly, teams might need to combine the number of units investigated to match an individual's data set but then may not be able to find enough results. The goal is for students to succeed so it's important to give just enough information so that they'll develop an acceptable project, but it is also important to allow them to locate additional resources if they want to engage the technical aspects of the software more thoroughly. It's also recommended that the exercise take place during mid-late semester, after students have become familiar with previous assignments, and rubrics, for them to be comfortable with asking questions.

Step 2: Project detail and on-going support. (Weeks 3-4)

At the beginning of week 3 students are given project details via class lecture and they are presented with a PowerPoint deck with the parameters of the assignment and the resources needed to complete the assignment. Students should be reminded that they are responsible for writing a report about their experience with the software and should allot time for both learning the software and performing the task. The grading rubric is provided and parameters of the inquiry reviewed. (Appendix B)

Students are assigned a level (entry level and internship are combined or associate) of employment and asked to identify how much experience is needed in years. The singular research question has prompted students to ask if they can search for other information. At this point they think the assignment is too simple and believe they will be able to do it easily and more importantly, quickly. Students may choose, or you may choose to assign them, to search for skills, education level, or salary. Questions, I asked were:

What type of job do you think you will apply for after your degree? or alternately, are you already in your chosen career (they could then perform the investigation on their existing position).

- What type of work do you want to do when you graduate?
- How many years of experience do you think a person needs for an internship entry-level position?
- What salary do you want to earn when you graduate?

Step 3: Review drafts, provide directions for advanced queries, and send emails with more in-depth software use information. (Weeks 5-8)

In each of the final three weeks of the project, an email should go out reminding students of the due date and the key factors of the project. Allowing students to present drafts of their work can be very important during these three weeks. By reviewing drafts, the faculty will have an opportunity to get the student back on track. Students who present drafts often include non-required elements in their reports. Being able to support advanced queries is ideal, yet not necessary. This is where being clear about what is being graded is important. Some students will leave out core elements because they get wrapped up in the exploration.

Step 4: The instructor provides written feedback on the report.

Students were relieved and frustrated that the rubric did not require special technical skills but following directions. Students were graded on the format, having all parameters of data collection identified and applied, as well as the presence of required visualizations. Students who performed more advanced elements of the inquiry were frustrated that they were not graded on their technical skills. For those students we added an ‘exemplary’ category and permission was asked to use the work as future examples. The grading rubric reflected the importance of the process not the outcome.

Select student reflection on exercise:

“After doing this project, I have found appreciation for qualitative analysis. The themes, overlapping of words, and data extracted from these job postings shed light on what employers are looking for in an applicant. If I were actively searching for a job, I would build my resume around the

data I found for this project.”

“Over the weeks I was transformed from a sceptic of the use of ICT [Internet Communication Technologies] in the classroom to being an appreciator of it and in fact a future user of it.”

Session Description.

In this 60-minute session, participants will be exposed to (and discuss) the issue of the disconnect between employer and student expectations for work.

We will then review a data analysis project that has been used in prior classes and consider preliminary findings. Detailed instructions will be provided as handouts.

Participants with a cell phone or laptop will be able to interact with the exercise using an online link to the activity. A paper version simulating the steps of the activity from the perspective of the students will be provided, after which participants will consider and discuss how such an activity could be leveraged into their own classes.

References

- AAC&U. (2013). It takes more than a major: Employer priorities for college learning and student success. Retrieved from https://www.aacu.org/sites/default/files/files/LEAP/2013_EmployerSurvey.pdf
- Davenport, T. H., & Harris, J. G. (2007). *Competing on analytics: The new science of winning*. Boston: Harvard Business Press
- Finley, A., & McNair, T. (2013). Assessing underserved students' engagement in high-impact practices.
- Goldsmith, S., & Coleman, K. M. (2022). *Growing Fairly: How to Build Opportunity and Equity in Workforce Development*. Brookings Institution Press.
- Harris-Reeves, B., & Mahoney, J. (2017). Brief work-integrated learning opportunities and first-year university students' perceptions of employability and academic performance. *Australian Journal of Career Development*, 26(1), 32–37. <https://doi.org/10.1177/1038416217697974>
- Hora, M. T. (2019). *Beyond the skills gap: Preparing college students for life and work*. Harvard Education Press.
- Kezar, A., Hypolite, L., & Kitchen, J. A. (2020). Career Self-Efficacy: A Mixed-Methods Study of an Underexplored Research Area for First-Generation, Low-Income, and Underrepresented College Students in a Comprehensive College Transition Program. *American Behavioral Scientist*, 64(3), 298–324.
- Lareau, A. (2011). Unequal childhoods. In *Unequal Childhoods*. University of California Press.
- Lubinski, D. (2020). Understanding educational, occupational, and creative outcomes requires assessing intraindividual differences in abilities and interests. *Proceedings of the National Academy of Sciences*, 117(29), 16720-16722.
- Mayer-Schönberger, V., & Ramge, T. (2018). *Reinventing capitalism in the age of big data*. Hachette UK.
- QSR International Pty Ltd. (2020). NVivo (released in March 2020). <https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/home>

Appendix A: Instructions

Slide 1: Project purpose

Learn NVivo while conducting research about workforce opportunity

- Acquire knowledge of text mining software
- Become aware of industry expectations based on experience level
- Learn how to use LinkedIn for a job search

Slide 2: The value of the skill

Who uses NVivo for what?

Analysts in a variety of occupations need qualitative experience and half of them will need qualitative research experience. This tool is used for qualitative data analysis.

- 12, 695 job postings for qualitative
- 6, 732 job postings for qualitative research
- 38.83 median hourly wage
- **Slide 3: Contextualize the Inquiry**

Business Question

What is the experience level requirement for a Business Analyst in Los Angeles county?

- In an analysis of 804 job postings in Los Angeles county
 - 36% of listings have no education requirement listed
 - 30% of listings have no experience requirement listed
 - 9% list salary observations
 - Median hourly earnings are 43.17 an hour
- **Insight: Not listed and not required are NOT the same thing**
 Of those 804 postings only one had no education or experience required. Instead, they listed skill sets that usually come from experience or education. This position offered an annual salary of 70,000.00 (Example: Ensure quality of deliverables using development testing methods, code reviews and user acceptance testing)

Slide 4: Video Introductions to NVivo

What is QDAS-Qualitative Data Analysis Software?

- [https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/support-services/customer-hub/getting-started-\(1\)/getting-started](https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/support-services/customer-hub/getting-started-(1)/getting-started)

You will leave this course knowing how to

1. [Intro & Import](#): A general overview of what NVivo does, and how to import data.
2. [Organize](#): A first look at how to code, note-keeping options, how to create cases (the units of analysis) and give them attributes (descriptive information).
3. [Explore](#): Run a word frequency query and create a word cloud, then create a simple chart showing opinions on an issue.

Slide 5: How to create a dataset using LinkedIn

Video One shows how to upload a word document to NVivo.

The first step in creating an NVivo “Project” is to import a supported file. The term “file,” is the collective term for the research material being explored. To add a file, open NVivo and select “+” new project in the welcome screen. A screen will appear where one can annotate the name of the project. Of note, any new NVivo project will be located in the “Documents” folder of a computer by default. Secondly, coding is an essential task in virtually all qualitative research projects. To create a dataset for the current study, each student copy/pasted a job description from a job announcement of their choosing on LinkedIn® into a Microsoft® Word document.

Each student created a data set which includes 60 job postings from LinkedIn that were a) full-time, b) posted within the last 30 days, and c) in Los Angeles County. Students then uploaded, organized, and coded their documents. They were asked to create a code to analyze “years of experience” needed and assigned either intern/entry-level or associate level employment. The tool

required for the project was NVivo Windows (QSR, 2020). At the conclusion of the project the students are required to submit their NVivo data file, and a report constructed to include:

- APA formatted title page
 - Section 1: Summary of project
 - Section 2: Data collection and analysis
 - Section 3: Findings and conclusion
 - Section 4: Reflection on the project-based learning and software engagement (minimum 300-words)
- References
 - Appendices comprised of query outputs

Slide 6: How to complete the tasks required in this project

Video Two gives a tour of the software features that will be needed to complete the most basic elements of the project. This video does not delve into how the items should be used but where key menu items (classifications, codes, and queries) that will be needed to complete the project are located.

Tasks

How to tips for your Tasks

- Create data set
 - Cut and paste a copy of the job description into a word document
 - Each job description is one case. Each person will have approximately 60 documents associated with this project.
- Maintain a data log
 - Record each step of your data journey, including codes
- Clean, then describe your data set in your data log
 - Record the steps you take to filter your data
 - Ex: A search for Business Analyst in Los Angeles County yielded [number] positions. When filtered by 'experience level' of Entry level and Internship [number] remained. The duplicates were removed and [number] postings remained for analysis.
- Code
 - Code each document for length of experience required Years

Slide 7: Coding in NVivo

Video Three shows three (3) ways to code a document: using the quick code bar at the bottom of the page, using the create code menu, or coding actual text (en vivo). It also covers how to run the basic queries required in the project and previews other features like mind-maps, word clouds, and tree maps.

Query Options by Hull Uni Library

<https://www.youtube.com/watch?v=ddVp6ILA318>

<https://youtu.be/J1O5QUeHCj4>

Word Frequency Query

1000 words

Grouping: Stemmed words

Text search query

Experience AND years

Cross-tab Query

Appendix B: Grading Rubric

Format

Tables and charts are numbered appropriately (and titled)

Table/chart index provided

Academic/Professional writing style applied

APA style applied

Data collection

Data parameters set according to requirements

Data parameters discussed

60 case files submitted, or limitation discussed

65-90 case files analyzed

Data preparation

Coding schema identified in text

Missing data limitations identified in text

Data analysis

Process explained

Limitations explained

Insights provided

Recommendations provided

Data visualizations

Word cloud presented

Other visualizations presented

Overall

Incomplete- Does not meet minimum requirements in at least one area (perhaps multiple)

Complete- Meets minimum requirements in each area

Satisfactory- Exceeds minimum requirements in at least one area

Professional- Good work; Exceeds minimum requirements in multiple areas

Exemplary- Exceptional work; Exceeds minimum requirements and shows analytic promise