

Bridging the Gap:

Comparing Employer and Educator Expectations in Small Animal Dentistry

Brock Akerman, Hanan Ali, Taylor Cesarski

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1 Abstract

2 Introduction

Dr. Marica Ross-Estrada, a faculty member at North Carolina State University's College of Veterinary Medicine, is exploring whether there are differences between the expectations of small animal primary care veterinary employers and veterinary educators regarding new graduates' competencies in dentistry. Through her own professional experience and conversations with colleagues, Dr. Ross-Estrada observed that many veterinarians must rely on on-the-job training to gain the skills necessary in small animal dentistry. These shared experiences prompted her to investigate whether there is a misalignment in what is taught in veterinary programs and what is expected in clinical practice.

To explore this question, Dr. Ross-Estrada distributed two surveys: one to medical directors and private practice owners and the other to primary care veterinary educators. Both surveys included similar questions regarding what early-career veterinarians are expected to have learned during their education and the skills they are expected to perform in practice.

2.1 Research Question

How do small animal primary care employers (medical directors and practice owners) and primary care veterinary educators differ in regards to their expectations of early career veterinary graduates' competencies in small animal dentistry?

2.2 Statistical Questions

1. Are there significant differences between educators and practice owners in their belief that new graduates are competent in key dental skills on their first day of practice?

2. Is there a difference between educators and practice owners in their reports (educators' actual teaching vs. owners' perceptions) of which dental skills were taught in the pre-clinical DVM curriculum for recent graduates?
3. Is there a difference between educators and practice owners in their level of agreement about whether specific dental skills should be taught pre-clinically?
4. Do employers and educators differ in their expectations about how many dental procedures new graduates should complete during clinical training?
5. Is there difference between the instructional formats in dentistry reported by DVM programs and the formats perceived by employers to have been completed by early career veterinarians?
6. Do educators and employers differ in their views on which formats of clinical instruction in dentistry should be required for DVM students as part of their clinical training?
7. Is there a difference between the clinical dentistry skills that educators report DVM students are learning during their clinical training and the skills that employers believe recent graduates have completed as part of their DVM program?
8. Do educators and employers differ in their opinions about which clinical dentistry skills DVM students should be required to practice or learn during their clinical training?

3 Data

3.1 Data Description

Two separate surveys were administered to mutually exclusive groups: veterinary employers who have worked with students, and educators who have taught students. There was no overlap between these groups and they can be assumed to be independent.

The employer data set consists of responses from 29 participants answering 40 questions, while the educator data set includes 43 participants answering 34 questions. Each group was asked a single qualifying question to determine eligibility for participation, along with nine questions covering demographics and institutional context. Educators were then presented with 24 competency and sentiment-based questions, while employers answered 30 such items focused on professional expectations and training in veterinary medicine.

Survey questions took several forms. Some were binary (Yes/No), particularly those related to demographics and institutional affiliation. Others used a "select all that apply" format, commonly seen in questions asking respondents to identify procedures performed at their practice. Many of these questions were followed by Likert-scale items. The Likert scales were even-numbered and omitted a neutral option, which may have contributed to at least two instances where respondents selected both "agree" and "disagree" for the same item.

Several questions offered an "Other" response with a text box for elaboration. A few required numeric input, such as estimates of hours worked or the number of practicing veterinarians. These integer fields were not restricted by any upper bound, regardless of contextual reasonableness.

Global survey session metrics

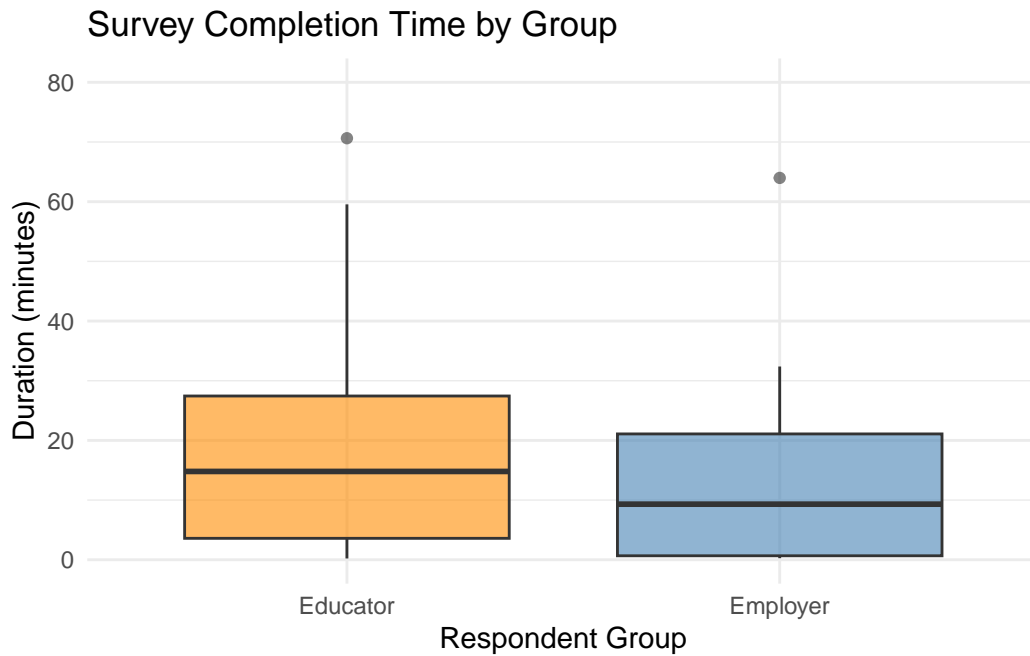


Figure 3.1: Assessing survey elapsed time distribution via box plots to understand engagement by survey group.

Survey completion time differed by group. Educators, on average, spent more time completing the survey than employers. While no follow-up question asked participants to explain their response time, this discrepancy may reflect greater engagement or a tendency for more elaborated responses among educators. It may also suggest a greater willingness among educators to participate more thoughtfully. The box plot below illustrates the distribution of survey duration (in minutes) by group.

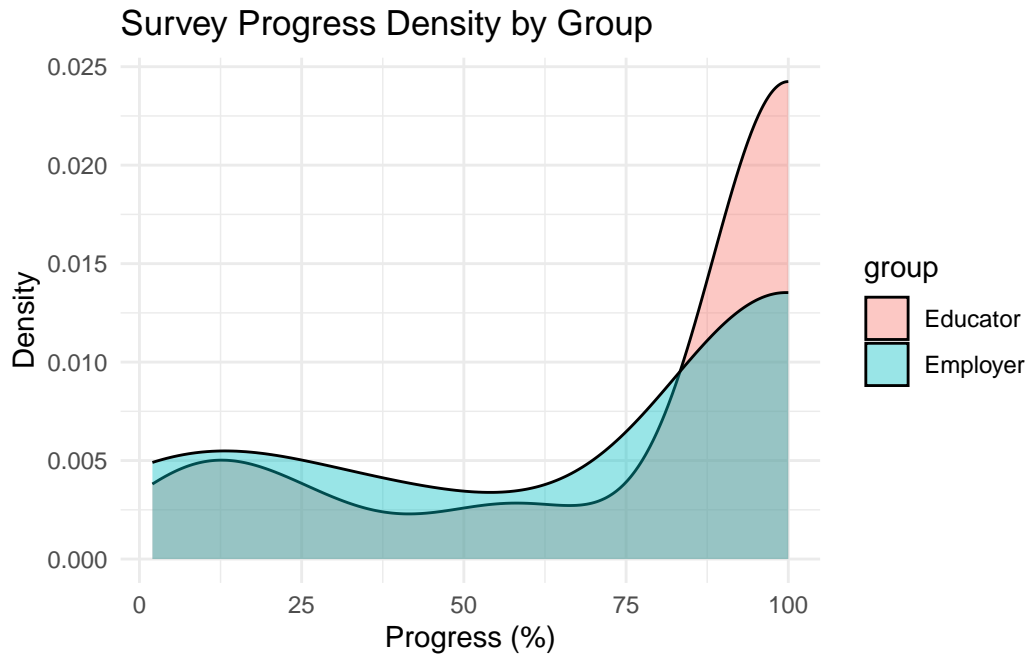


Figure 3.2: Assessing survey completion as a density curve to understand engagement by survey group.

Regarding the proportion of the survey completed, employer responses were more variable—spanning the full range from partial to full completion. In contrast, educators tended to complete more of the survey, with a concentration near full completion and a less pronounced left tail. The density plot below visualizes these differences in survey progress across groups.

Geographic Distribution of Survey Respondents

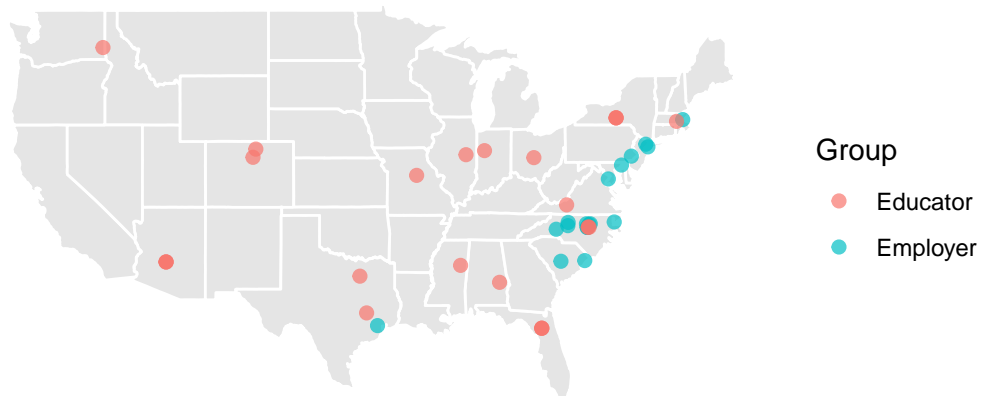


Figure 3.3: Geographic distribution of survey respondents across the United States.

Since our analysis focused on the representativeness of the United States, we identified three sets of coordinates in the educator dataset corresponding to international institutions: the University of Guelph in Ontario, Canada; Zanzibar University in Chake, Tanzania; and Chiba University in Chiba, Japan. Employer survey participants were predominantly sampled from locations along the eastern seaboard of the United States, while educators were more widely distributed across the country. We highlight this to illustrate that perceptions of veterinary dental students—particularly among employers—may differ for individuals located far from the regions where most participants were sampled. Additionally, because many of the responses came from major metropolitan areas, our findings may underrepresent opinions regarding student knowledge gaps in more rural settings.

Educator metrics

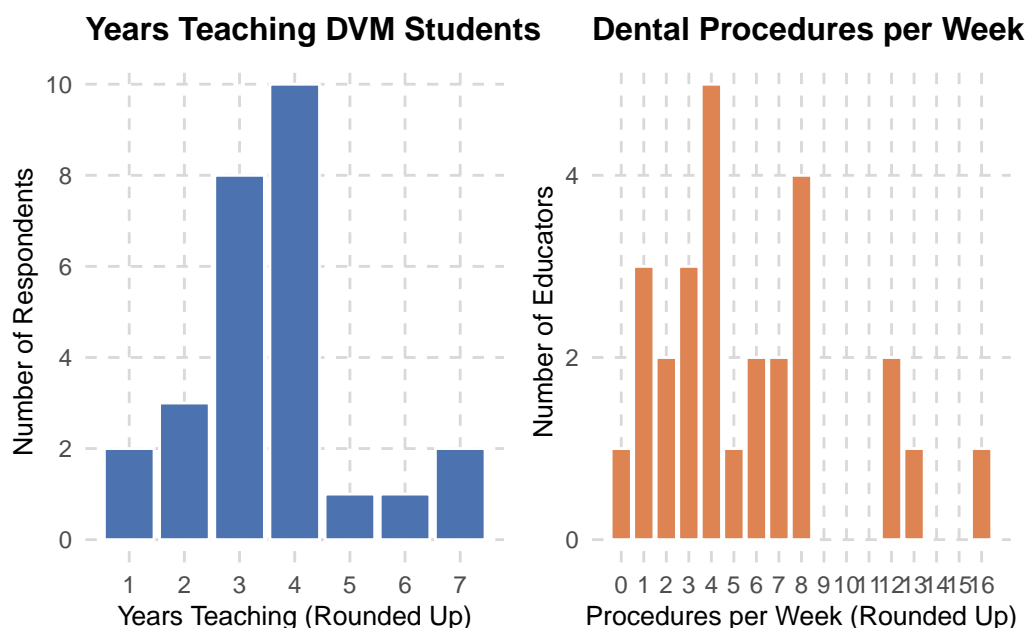


Figure 3.4: Educator contextualized background information about teaching and procedures.

Figure 3.3 provides an overview of the survey participants and their institutions. Most respondents reported having between 2 and 4 years of experience teaching veterinary students in clinical training. The distribution of years taught appears approximately normal, with fewer educators at the lower and upper ends of the experience range. Respondents also reported the number of dental procedures performed by their primary care service each week. While some outliers from busier institutions reported higher volumes, most educators estimated performing between 1 and 8 procedures per week.

Employer metrics

Table 1: Job Setting or Organization: Counts and Percentages

Job Setting	Count	Percentage
Group corporate veterinary practice	2	16.7
Independently owned group veterinary practice	2	16.7
Independently owned single veterinary practice	7	58.3
Industry/commercial	1	8.3

Table 2: Respondent Role: Counts and Percentages

Respondent Role	Count	Percentage
Associate veterinarian	2	18.2
Practice manager/HR representative	2	18.2
Practice owner	7	63.6

Table 1 and Table 2 provide additional context about the survey respondents. The majority of respondents work in privately owned veterinary practices, and most identified themselves as the owners of those practices.

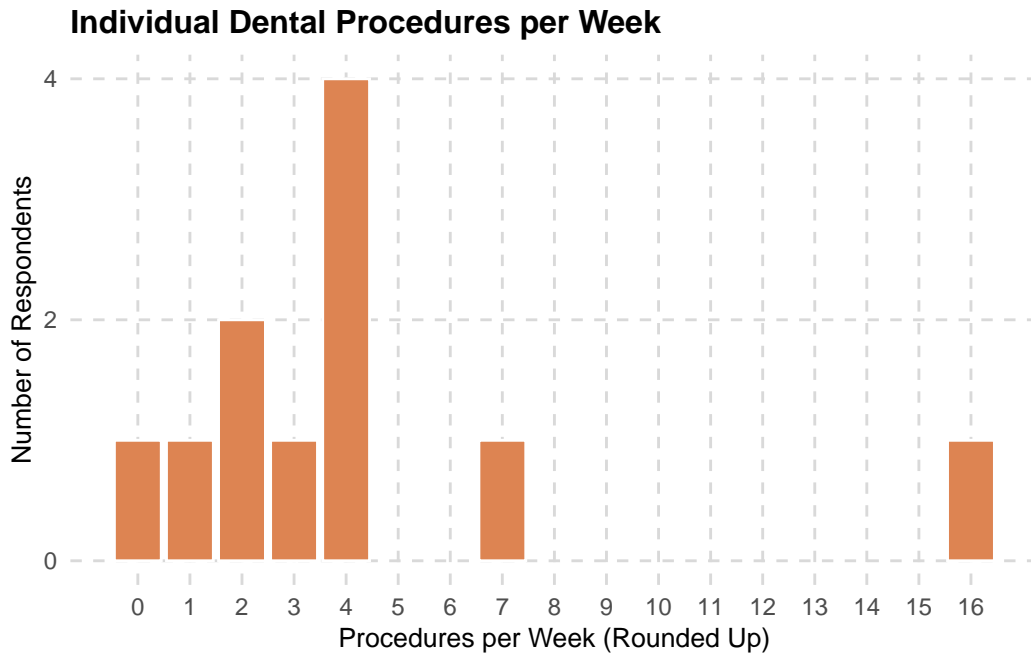


Figure 3.5: Average dental procedures employer survey participants indicated they performed each week.

Figure 3.5 shows that procedure counts tend to be lower in the employer group compared to the educator group, although the overall distribution shapes are similar. In both groups, the data exhibit a right-skewed pattern, with most respondents reporting lower procedure counts and a few outliers representing higher volumes. This pattern aligns with the intuitive understanding that while some practices or institutions have

greater clinical demands on veterinarians, these cases are less common—at least based on the survey responses.

3.2 Data Source

Survey data were collected using Qualtrics, a cloud-based experience management platform commonly used for gathering feedback and sentiment across workforce domains. Participants from the educator survey were recruited via email invitation sent by the researcher, using pre-existing contact lists. Dr. Ross-Estrada distributed the employer survey to her personal and professional networks online. Participation was voluntary and anonymous. There was no incentive offered for completing the survey.

3.3 Preprocessing Description

Although the employer and educator data sets shared a similar structure, they were not identical. Most pre-processing steps were applied uniformly across both data sets, with minor deviations where needed.

The data sets were imported into the RStudio environment (version 2024.04.1 Build 748). A new variable was created to label the data source (“Educator” or “Employer”) for later grouping and visualization. The existing respondent_id column served as a unique identifier and was treated as the primary key.

Initial cleaning involved removing extraneous metadata included by Qualtrics—such as survey start and end times, IP addresses, geolocation data, and question display logic—all of which were irrelevant to the analysis. These columns were trimmed to streamline the dataset for subsequent transformation and statistical work.

Column names in the original Qualtrics export were alphanumeric but often ambiguous and misleading. Many variable names did not match the corresponding survey question numbers. Our team manually mapped the exported column names to their corresponding survey questions and responses by referencing adjacent metadata fields and using deductive reasoning. This process allowed us to build an index-based column naming structure, which greatly improved the manageability and interpretability of the dataset.

Before diving into question-specific analysis, we first identified the subset of survey questions relevant to our research objectives. All unrelated or out-of-scope items were removed. This step reduced the employer dataset from 176 columns to 100, and the educator dataset from 171 columns to 102.

Several formatting inconsistencies also needed to be resolved. Some multi-select questions appeared in the form of comma-separated text responses within a single column, while others were exported into multiple binary columns. Additionally, for certain questions, a response option that received zero selections was dropped entirely by Qualtrics. To standardize these issues, we implemented a script to “explode” comma-separated responses into individual binary columns. For dropped columns, we manually reintroduced them as zero-filled dummy variables to preserve the full response structure.

Finally, we filtered out participants who answered less than half of the survey. We also excluded:

- Employers who responded “No” to the question: “Do you work with early career veterinarians (someone who has graduated from a DVM program after May 2021)?”
- Educators who responded “No” to: “Do you teach in any capacity of the dental curriculum at your institution?”