Bridging the Gap:

Comparing Employer and Educator Expectations in Small Animal Dentistry

Brock Akerman, Hanan Ali, Taylor Cesarski

2025-06-25

Table of contents

1 Abstract

Authors of each section

Introduction - Taylor Cesarski Data - Brock Akerman Methods - Taylor Cesarski Results - All

- Questions 1-4 - Hanan Ali
- Questions 5,7 - Taylor Cesarski
- Questions 6,8 - Brock Akerman

2 Introduction

Dr. Mariea 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

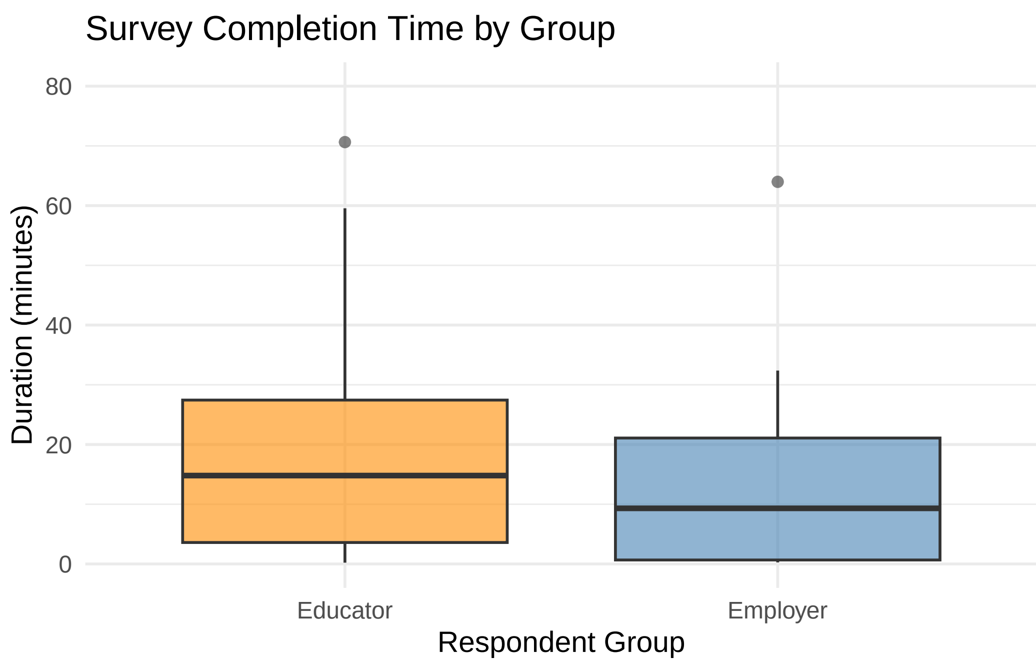

Figure 3.1: Assessing survey elapsed time distribution via box plots to understand engagement by survey group.

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.

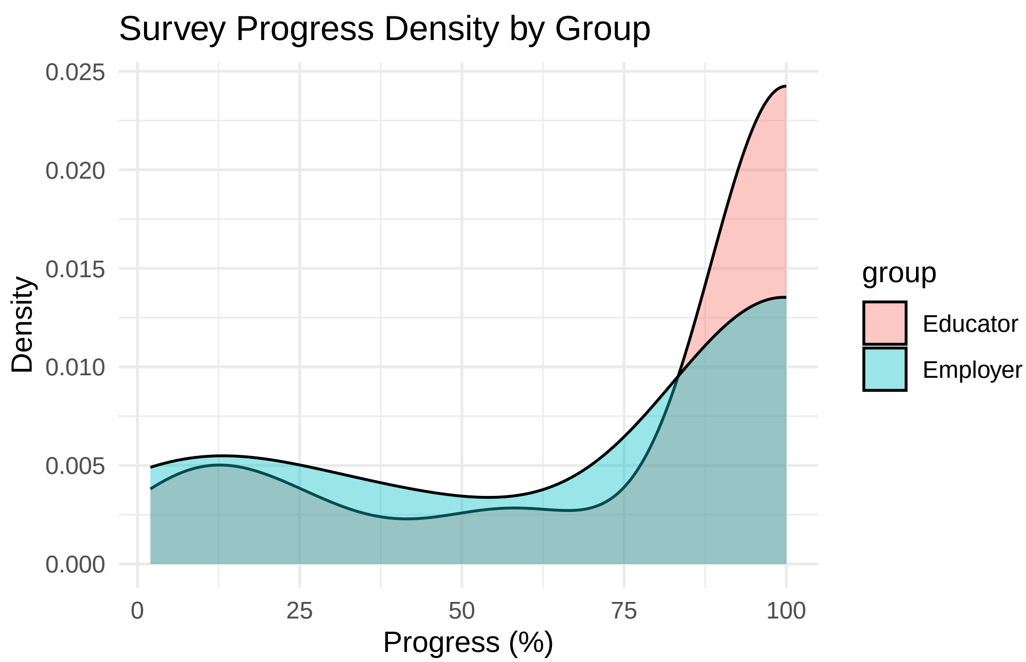

Figure 3.2: Assessing survey completion as a density curve to understand engagement by survey group.

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.

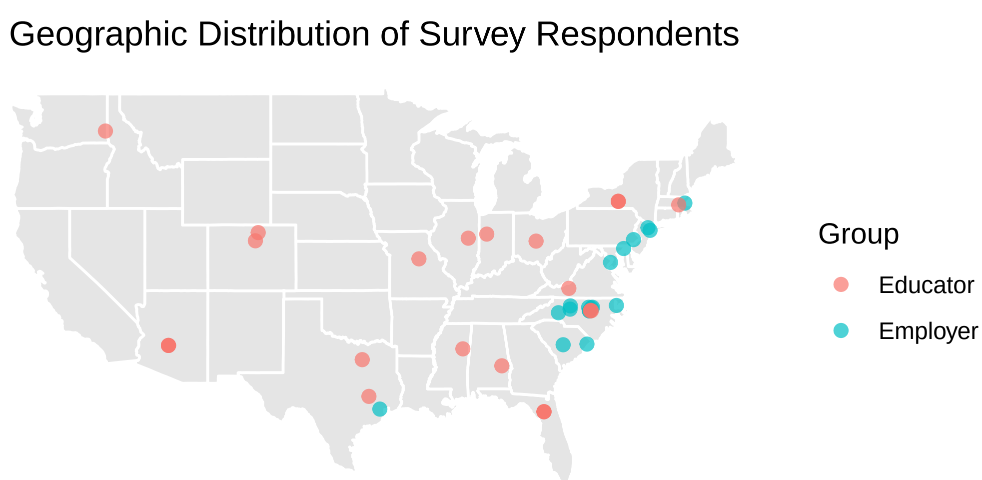

Figure 3.3: Geographic distribution of survey respondents across the United States.

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

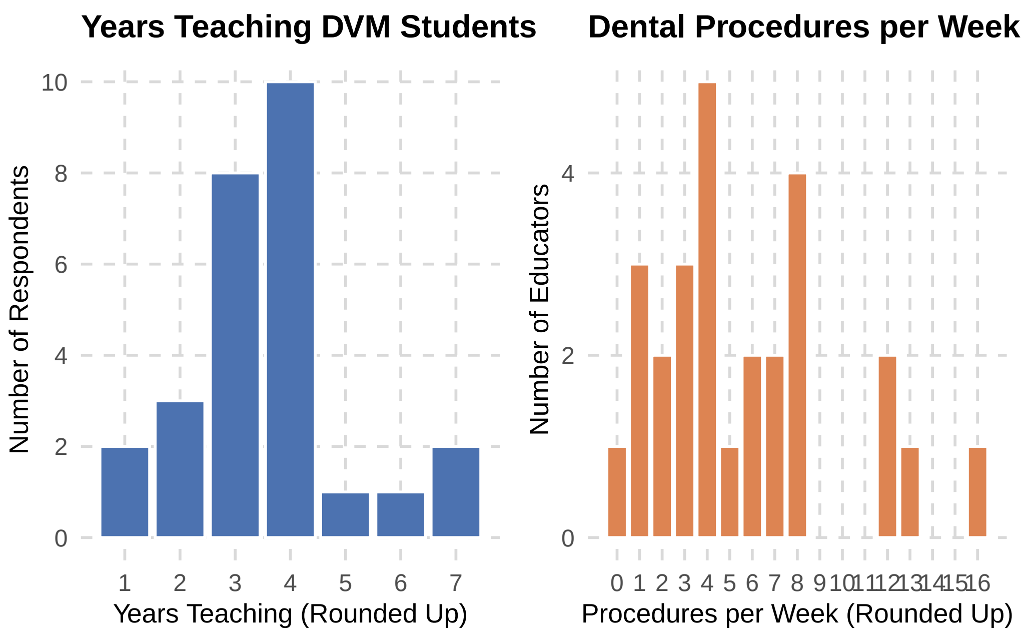

Figure 3.4: Educator contextualized background information about teaching and procedures.

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.

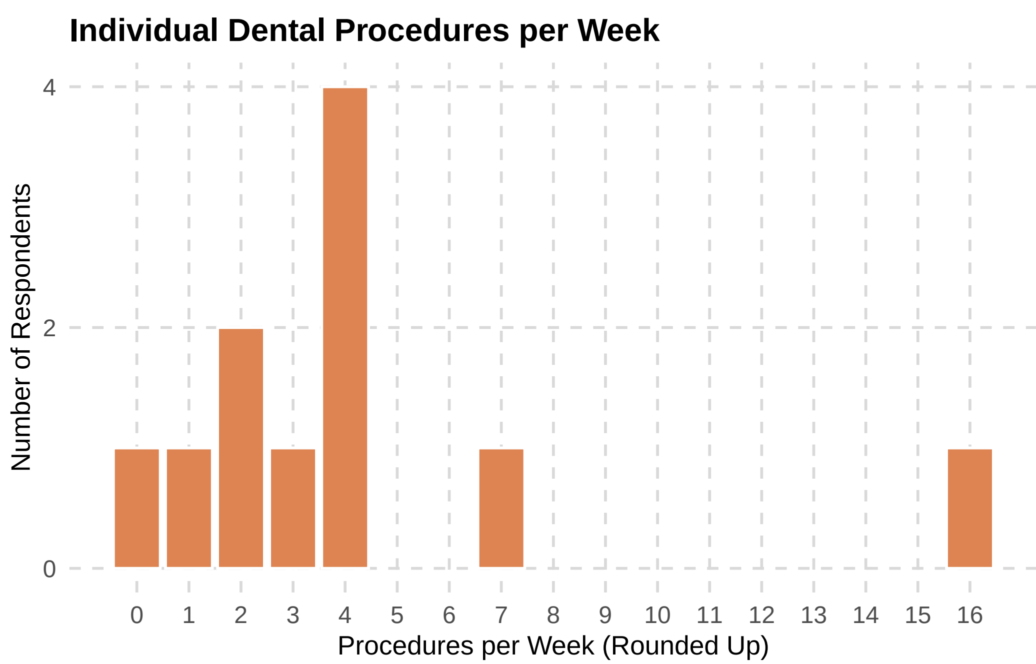

Figure 3.5: Average dental procedures employer survey participants indicated they performed each week.

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?"

After all preprocessing steps, the final cleaned datasets consisted of 13 employer participants and 30 educator participants.

4 Statistical Methods

4.1 Method Description

Likert scale questions (statistical questions #1,3, 6, and 8)

These questions use a Likert scale with response options: Strongly Agree, Agree, Disagree, and Strongly Disagree across a variety of skills and procedures. Given the ordinal nature of these responses, we will use diverging stacked bar charts and summary tables to visually explore the data, followed by a Mann-Whitney U Test for formal hypothesis testing.

The Mann-Whitney U Test is a non-parametric test used to assess whether there is a statistically significant difference in the distributions of ordinal or continuous variables between two independent groups. In this case, educators and employers are assumed to be independent, consistent with the survey design.

This test is appropriate for Likert-scale data because:

- It does not assume normality (unlike the t-test),
- It respects the ordinal (ranked) structure of the data,
- It retains statistical power in small samples.

Table 3: Mann-Whitney U Rank Summary Table

Group	Sample.Size	Sum.of.Ranks	Mean.Rank
Group 1 (e.g., Educators)	n□	R□	R□ / n□
Group 2 (e.g., Employers)	n□	R□	R□ / n□

In order to calculate the test statistic and p-value for a Mann-Whitney U Test:

- All observations are ranked together
- The sum of the ranks for each group is calculated (R_1 and R_2)
- The test statistic U is then calculated as the minimum of U_1 and U_2 where U_1 and U_2 are the following: $U_1 = R_1 - \frac{n_1(n_1+1)}{2}, U_2 = R_2 - \frac{n_2(n_2+1)}{2}$
- Then the p-value is calculated from the U distribution or normal approximation.

P-values will be utilized for each statistical question listed above in order to formally analyze the data.

Select all that apply questions (statistical questions #2, 5, and 7)

These questions asked the participants to "select all that apply" as it relates to skills in pre-clinical curriculum, format of dental instruction, and skills for clinical training respectively. We will utilize frequency tables and bar plots to explore the data for these questions and use Fisher's Exact Test as a formal inference procedure for the comparison of the two groups. Dot plots will also be utilized for questions with many options to avoid crowding in bar graphs.

Fisher's Exact Test works with categorical data with independent samples, in this case educators and employers. Based on the survey design from the client, it is again reasonable to assume that these two groups are independent. In this context, Fisher's Exact Test is preferred over Chi-Squared Tests due to the small sample size and therefore not meeting the expected count threshold that is required to proceed with Chi-Squared Tests. Given the small sample sizes, we acknowledge the limited power of these analyses and may consider post hoc power analyses for these tests.

Table 4: Fisher's Exact 2×2 Contingency Table

Group	Outcome.Present	Outcome.Absent	Row.Totals
Group 1 (ex: Educators)	a	b	a + b
Group 2 (ex: Employers)	c	d	c + d
Column Totals	a + c	b + d	n = a + b + c + d

Fisher's Exact Test operates under the null hypothesis that there is no association between the two variables. The alternative hypothesis is that there is an association. The p-value for the test is computed using the following formula:

$$p = \frac{(a+b)!\,(c+d)!\,(a+c)!\,(b+d)!}{a!\,b!\,c!\,d!\,n!}$$

P-values are then computed for each skill, format, etc. between the two groups (educators and employers) depending on the statistical question to be analyzed.

Numerical entry questions: (statistical question #4)

This question asks participants to enter a number related to the number of dental procedures that should be completed during training in different areas. We plan to produce box plots and/or histograms to visually examine the data. Depending on the normality or lack thereof of the distributions, we will then conduct either a two-sample t-test or a Mann-Whitney U Test. As mentioned above, the Mann Whitney U test is a non-parametric test that does not depend on the assumption of normality. If the assumption on normality is met, we can consider a two-sample t test for this analysis.

Mann-Whitney U Test Results by Skill

Skill	p-value	Median (Educator)	Median (Employer)	n (Educator)	n (Employer)
Q04_03	0.064	3	3.0	30	12
Q04_10	0.242	2	3.0	30	13
Q04_05	0.260	3	3.0	30	13
Q04_06	0.396	3	3.0	30	13
Q04_02	0.485	3	2.5	29	12
Q04_04	0.492	4	4.0	29	13
Q04_09	0.533	2	2.0	29	13
Q04_08	0.728	3	3.0	30	13
Q04_01	0.872	4	4.0	30	13
Q04_07	0.955	3	3.0	30	13
Q04_11	1.000	1	1.0	8	4
Q04_12	1.000	3	4.0	2	1

5 Results

5.1 Statistical Analysis

S1 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?

To assess whether there are differences in perceptions of new graduate competence in dentistry, educators and employers were asked a parallel question (Q4). Employers were asked to rate their expectation that early career veterinarians can competently perform 12 specific dental skills on their first day of employment. Educators were asked to rate whether they believe new graduates can perform those same skills competently. Responses were recorded on a 4-point Likert scale from 1 (Strongly Disagree) to 4 (Strongly Agree).

We used the Mann-Whitney U test to compare the responses between educators and employers for each skill. This non-parametric test is appropriate for comparing ordinal data between two independent groups, especially when the assumptions for parametric tests may not hold. Ratings were reshaped into long format and analyzed skill-by-skill. Median scores and group sizes were also reported to support interpretation of the findings.

The results showed no statistically significant differences between educators and employers for most skills, indicating general agreement about which dental competencies new graduates possess. The only skill approaching significance was interpreting dental radiographs ($p = 0.064$), where employers appeared slightly more confident than educators. While this difference is subtle (both groups had a median rating of 3), it may warrant further exploration in future studies. Overall, the findings suggest alignment between educational preparation and employer expectations regarding small animal dentistry skills.

S2 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?

To evaluate whether differences exist between DVM educators and employers in their understanding of which dental skills are taught in the pre-clinical curriculum, we analyzed responses to parallel survey questions. Educators were asked to indicate which of seven core dentistry skills are taught as part of their pre-clinical courses (Q12), while employers were asked which skills they believe recent graduates were taught prior to clinical training (Q16). Since the two groups answered different question numbers about the same underlying skills, we first aligned the datasets by renaming employer variables to match educator labels. This harmonization allowed for direct comparison of responses skill-by-skill across the two groups.

After cleaning and reshaping the data into long format, we filtered out invalid or missing entries and conducted Fisher's Exact Tests for each skill. This non-parametric test is appropriate for evaluating categorical (yes/no) outcomes in small samples, especially when comparing proportions between two independent groups. Only skills for which both groups provided non-missing responses were included in the final analysis. One skill item was excluded due to all responses being missing, and approximately 70% of employer data for Q16 items were incomplete, limiting the strength of some comparisons.

The results of the Fisher's tests revealed no statistically significant differences between educators and employers for any of the seven aligned skills (all p-values > 0.32). Both groups reported similar proportions of skills being taught, with educator endorsement rates ranging from approximately 53% to 77%, and employer endorsement ranging from 54% to 92%. These findings suggest general agreement between what educators report teaching and what employers believe early career veterinarians have been taught in the pre-clinical phase of training. The overall consistency supports the idea that pre-clinical dental training expectations are reasonably aligned between academic programs and employer perceptions.

Table 5: Fisher's Exact Test Results by Skill

Skill_Format	p_value	n_educator	n_employer	prop_educator	prop_employer
Q12_03	0.324	30	13	0.700	0.538
Q12_01	0.400	30	13	0.767	0.923
Q12_05	0.485	30	13	0.733	0.615
Q12_07	0.736	30	13	0.633	0.538
Q12_02	0.743	30	13	0.533	0.615
Q12_06	0.747	30	13	0.600	0.538
Q12_04	1.000	30	13	0.633	0.615

S3 Is there a difference between educators and practice owners in their level of agreement about whether specific dental skills should be taught pre-clinically?

To assess whether educators and employers differ in their beliefs about which dental skills should be included in the pre-clinical DVM curriculum, we analyzed responses to parallel Likert-scale questions: Q13 (educators) and Q17 (employers). Both groups rated the importance of teaching 12 specific dentistry skills using a 4-point Likert scale ranging from 1 (Strongly Disagree) to 4 (Strongly Agree). Because the data were ordinal and responses came from two independent groups, the Mann-Whitney U test was used to compare educator and employer ratings for each skill individually.

The results showed statistically significant differences in opinion for two of the twelve skills. Employers were significantly more likely than educators to agree that feline open extractions involving multiple roots or canines (Skill_11, $p = 0.003$) and fluoride treatment (Skill_12, $p = 0.013$) should be included in the pre-clinical curriculum. For all other skills, there were no statistically significant differences between groups (all $p > 0.10$), and the median rating for most skills was 4 ("Strongly Agree") in both groups. These findings suggest general alignment between educators and employers on most skills, but highlight a few areas—particularly more advanced feline extractions and fluoride use—where employer expectations may exceed what educators currently prioritize for pre-clinical training.

S4 Do employers and educators differ in their expectations about how many dental procedures new graduates should complete during clinical training?

S5 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?

Both educators and employers were asked a question relating to the format of instruction during the clinical year.

On question 20 of their survey, employers were asked: "What format of clinical instruction in dentistry do you believe that the early career veterinarians (individuals who have graduated from a DVM program after May 2021) hired into your practice/organization/institution completed as part of their DVM training? Select all that apply."

On question 16 of their survey, educators were asked: "What format of instruction in dentistry does your DVM program provide during the clinical year? Select all that apply."

Since the question was of the format "select all that apply," participants were able to select more than one response and percentages will not add to 100%. Results reported below are the percentages of their respective group (educators or employers) that selected the given format of instruction. Percentages were utilized due to the difference in sample size.

Educators and employers were also given the option to enter their own responses to the question. One employer opted to write in "Cadaver." Two educators entered their own responses with one saying "rounds" and the other saying "topic seminars do occur with some rotations during case rounds when dental cases are chosen to present."

Educators and employers differed in their perceptions of clinical dental instruction formats completed by early career veterinarians. While a majority in both groups acknowledged didactic instruction, educators reported higher rates of wet lab (73.3% vs. 46.2%) and live patient training (93.3% vs. 38.5%) compared to employers. Conversely, employers more frequently identified simulation training (30.8% vs. 16.7%) than educators. These differences suggest varying expectations or awareness between the two groups regarding dental training experiences of recent graduates.

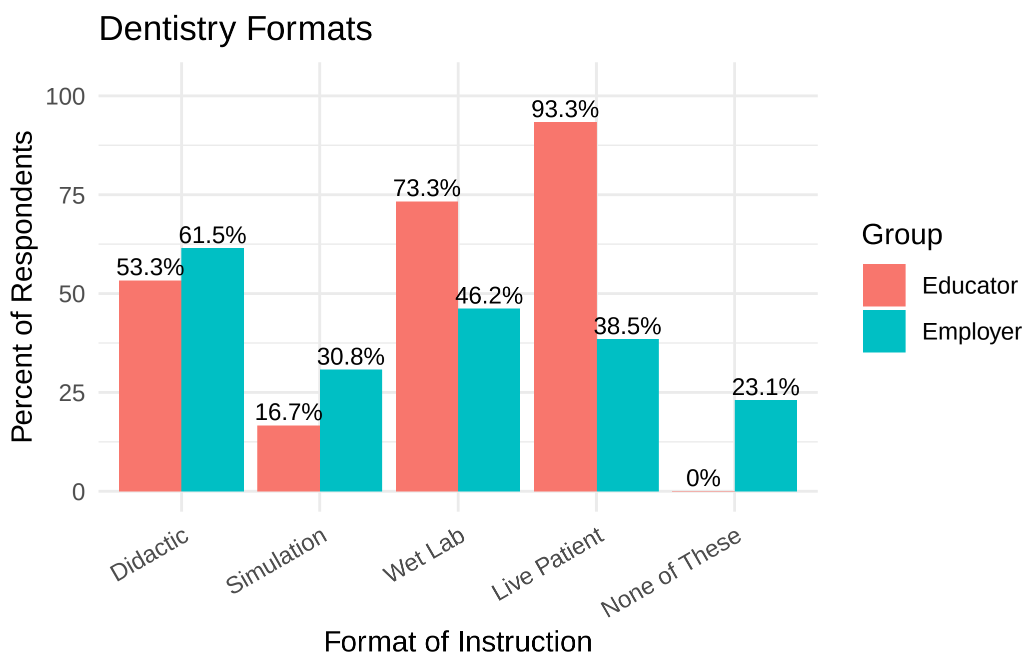

Figure 5.1: Perceived Clinical Instruction Formats in Dentistry Completed by Early Career Veterinarians

Figure 5.1 shows the percentages of each format selected and Table 3 shows the p-value associated with performing Fisher's Exact Test on each format.

Didactic instruction was selected by 53.3% of educators and 61.5% of employers, with no statistically significant difference between the groups (p=0.743). There was also no statistically significant difference in simulation (p=0.417) and wet lab instruction (p=0.162).

On the other hand, live patient instruction was selected by 93.3% of educators, but only 38.5% of employers. This difference was found to be statistically significant with a p-value of 0.0003.

"None of these" was also found to be statistically significant at the 5% level. No educators selected that none of these formats were used, but 23.1% of employers selected that none of the formats were believed to be utilized in the clinical year.

Table 6: Perceived Formats of Clinical Dental Instruction in DVM Programs

Format	% of Educators Selected	% of Employers Selected	P-value
Didactic	53.3	61.5	0.743
Simulation	16.7	30.8	0.417
Wet Lab	73.3	46.2	0.162
Live Patient	93.3	38.5	0.000303 ***
None of These	0.0	23.1	0.0232 *

S6 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?

In question #21 of the employers' version of the survey, participants were asked:

- "Which of the following types of clinical instruction in dentistry do you think that DVM students should be required to complete as part of a DVM program? Select one response for each of the instructional types listed below."

The analogue of this question for educators was survey question #17, which asked:

- "Which of the following types of instruction do you think DVM students should be required to complete as part of their clinical training? Select one response for each type of instruction listed below."

This question aimed to assess how participants view the types of dental instruction that should be required within veterinary medical curricula. To examine whether there were differences in opinions between educators and employers, the Mann-Whitney U-Test—a non-parametric test also known as the Wilcoxon Rank-Sum Test—was used. This test is appropriate for comparing two independent groups without assuming a normal distribution and assumes mutual exclusivity between the groups.

Table 7: Mann-Whitney U-Test Results for Instruction Types

Instruction_Type	W_Statistic	P_Value	Significance	Notes
Didactic	138.5	0.415	ns	Test performed
Simulation	108	0.363	ns	Test performed
Wet Lab	162	0.713	ns	Test performed
Live Patient	263.5	0.003	**	Test performed
None of these	-	-	-	Insufficient data
Other	-	-	-	Insufficient data

The results are presented in Table 7. No statistically significant differences were found between educators and employers in their responses regarding the Didactic, Simulation, or Wet Lab instructional formats. However, a significant difference was identified between the two groups concerning Live Patient instruction, where responses varied significantly. The instructional categories "None of These" and "Other" could not be tested due to insufficient data.

S7 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?

Both educators and employers were asked a question related to skills learned and practiced during the clinical year.

On question 25 of their survey, employers were asked: "Which of the following skills do you think that individuals who graduated with a DVM degree after May 2021 completed during the clinical training portion of their DVM program? Select all that apply."

On question 20 of their survey, educators were asked: "Which of the following skills are DVM students at your institution practicing/learning during the clinical training portion of the DVM program? Select all that apply."

Since the question was of the format "select all that apply," participants were able to select more than one response and percentages will not add to 100%. Results reported below are the percentages of their respective group (educators or employers) that selected the given format of instruction. Percentages were utilized due to the difference in sample size.

Educators and employers were also given the option to enter their own responses to the question. No employers entered any text responses. Six educators entered text responses of the following:

- "OvaVet gel application, Crown amputation, Sealant application for UCF, oral tumor biopsy and excision, orthodontia"
- "Nerve blocks, barrier sealant and bonded sealant application, jaw fracture repair, root canals"
- "Often- bonded sealants; Sometimes- root canals, restorations, jaw fracture repair"
- "Oral biopsy, root planning, bonded sealants"
- "extractions only if performed on that patient"
- "Not all students see all types of extractions"

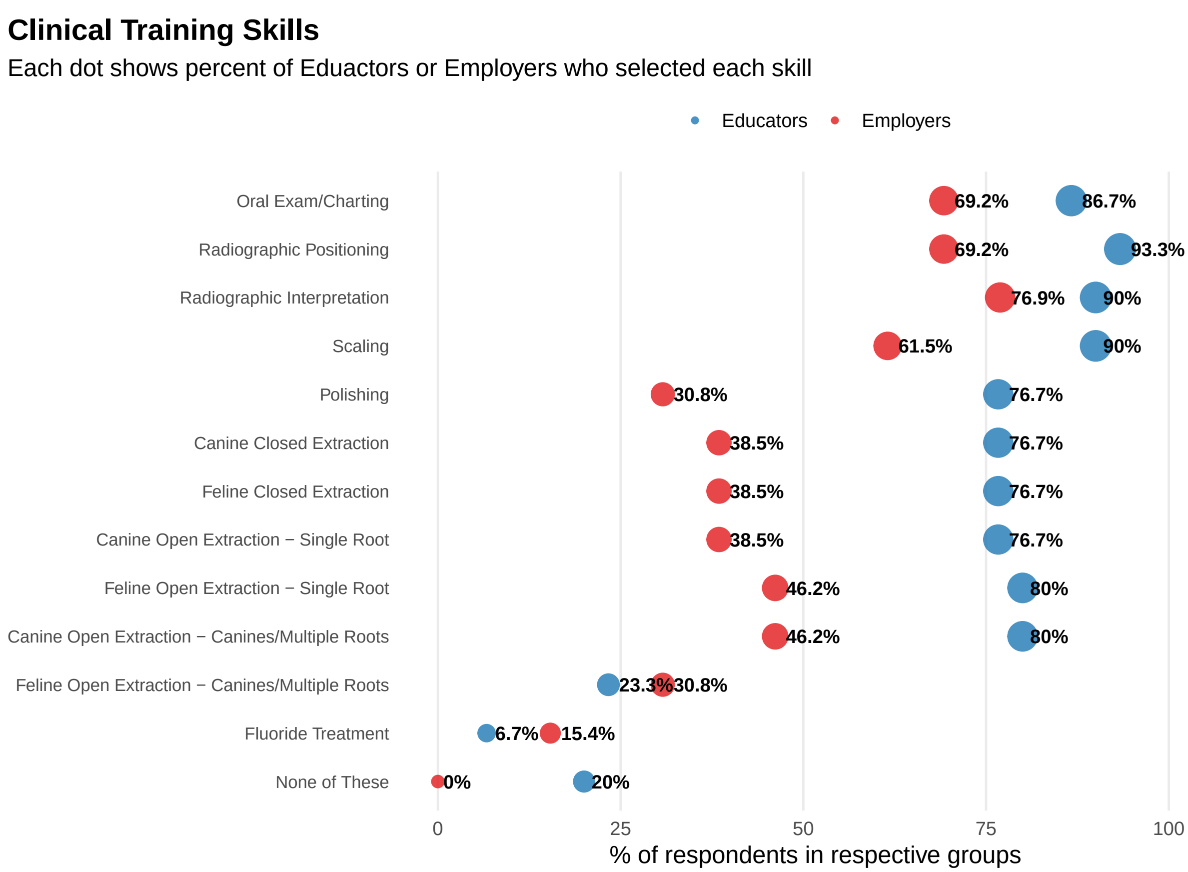

Figure 5.2: Clinical Training Skills Perceived by Educators vs Employers in DVM Programs

Table 8: Perceived Skills Learned of Clinical Dental Instruction in DVM Programs

Skill	% of Educators	% of Employers	P-value
Oral Exam/Charting	86.7	69.2	0.217
Radiographic Positioning	93.3	69.2	0.0576
Radiographic Interpretation	90.0	76.9	0.345
Scaling	90.0	61.5	0.0415 *
Polishing	76.7	30.8	0.00672 **
Canine Closed Extraction	76.7	38.5	0.0339 *
Feline Closed Extraction	76.7	38.5	0.0339 *
Canine Open Extraction - Single Root	76.7	38.5	0.0339 *
Feline Open Extraction - Single Root	80.0	46.2	0.0367 *
Canine Open Extraction - Canines/Multiple Roots	80.0	46.2	0.0367 *
Feline Open Extraction - Canines/Multiple Roots	23.3	30.8	0.709
Fluoride Treatment	6.7	15.4	0.572
None of These	20.0	0.0	0.155

Figure 5.2 shows the percentage of employers and educators who selected the given skills and Table 4 shows the p-values associated with Fisher's Exact Test and their significance.

For eleven of the thirteen skills, educators reported a higher percentage of selection. The two skills for which employers reported higher perceived learning were feline open extraction - canines/multiple roots and fluoride treatment.

At the 5% significance level, the difference in skill selection between employers and educators was found to be significant for seven skills:

- Scaling
- Polishing
- Canine Closed Extraction
- Feline Closed Extraction
- Canine Open Extraction - Single Root
- Feline Open Extraction - Single Root
- Canine Open Extraction - Canines/Multiple Roots

For all skills with statistically significant differences, educators reported higher percentages than employers.

The most significant difference was found in polishing. Educators selected this skill 76.7% of the time, while employers selected this skill only 30.8% of the time. The resulting p-value was 0.00672.

S8 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?

In question #26 of the employers' version of the survey, participants were asked:

- “Which of the following skills do you think that DVM students should be required to practice/learn as part of the clinical training portion of a DVM program? Select one response for each of the skills listed below.”

The corresponding question for educators was survey question #21.

This question aimed to assess opinions on which clinical dentistry skills should be required in DVM student training. To evaluate whether differences existed between educators and employers, the Mann-Whitney U-Test, a non-parametric test also known as the Wilcoxon Rank-Sum Test, was applied. This test compares two independent groups without assuming normality and requires mutual exclusivity between groups.

The results are presented in Table 9. No statistically significant differences were observed between educators and employers for most of the listed clinical skills, including oral examination/charting, radiographic positioning, radiographic interpretation, scaling, polishing, or several extraction procedures. However, significant differences were identified for the skills of feline closed extraction and canine open extraction—single root, with p-values of 0.049 for both. Two additional procedures—feline open extraction—single root and canine open extraction—canines/multiple roots—approached significance ($p = 0.076$). The “Fluoride treatment” and “None” categories could not be tested due to insufficient data.

Table 9: Mann-Whitney U-Test Results for Clinical Procedures

Instruction_Type	W_Statistic	P_Value	Significance	Notes
Oral exam/charting	139	0.622	ns	Test performed
Radiographic positioning	157	0.717	ns	Test performed
Radiographic interpretation	126.5	0.194	ns	Test performed
Scaling	156	0.762	ns	Test performed
Polishing	148.5	1	ns	Test performed
Canine closed extraction	127.5	0.328	ns	Test performed
Feline closed extraction	104.5	0.049	*	Test performed
Canine open extraction - Single root	104.5	0.049	*	Test performed
Feline open extraction - Single root	115.5	0.076	.	Test performed
Canine open extraction - Canines/multiple roots	115.5	0.076	.	Test performed
Feline open extraction - Canines/multiple roots	54	0.207	ns	Test performed
Fluoride treatment	-	-	-	Insufficient data
None	-	-	-	Insufficient data

6 Discussion/Conclusion

6.1 Interpretation of Results

6.2 Implications of the Study

6.3 Limitations

6.4 Recommendations

6.5 Summary of Key Findings

6.6 Final Thoughts

7 Appendix