Assessment of the Preparation of Aquatic Animal Health Veterinarians for Entry-Level Positions

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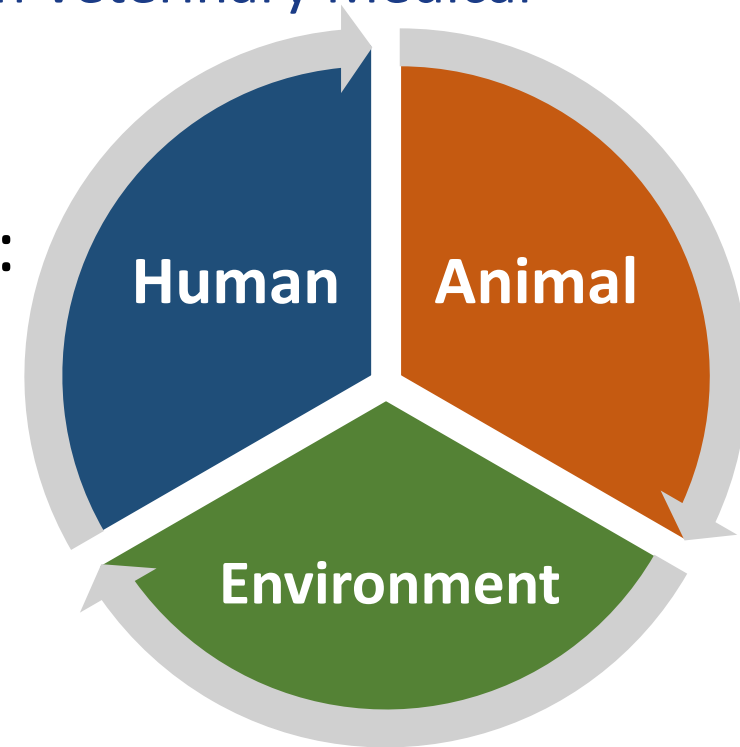**Iskande L.V. Larkin, PhD**
Ruth Francis-Floyd, DVM, MS, DACZM

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Background: VetMed Education

*"The primary **objective** of **veterinary medical education** is to graduate veterinarians with the **skills** that are **highly valued by employers and by society** in general"* (North American Veterinary Medical Education Consortium [NAVMEC], 2011, p. 31)

Reform movement for a competency-based curricula:

- Emphasis on comparative medicine skills
- Increase **One Health** training
- Improve **non-technical skills**

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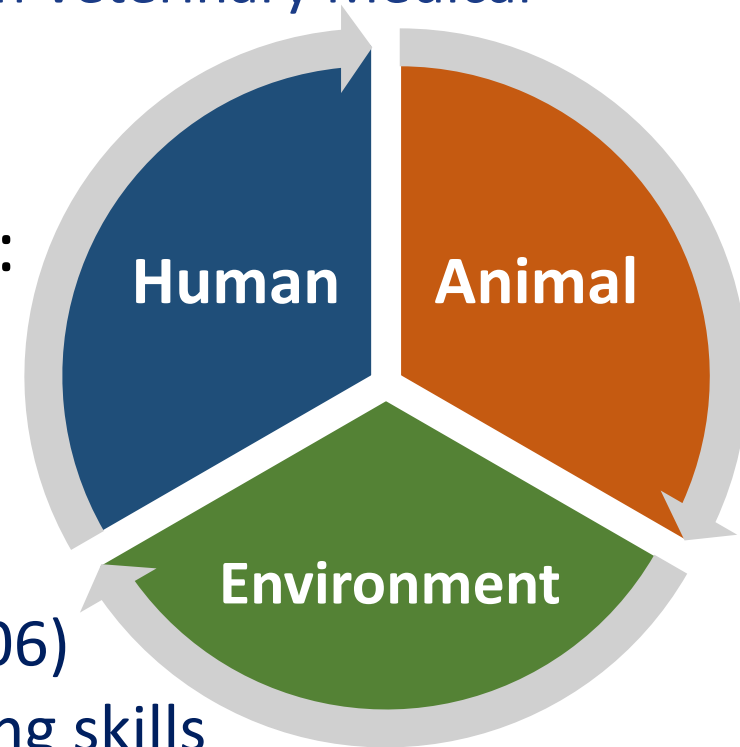
- Improve **non-technical skills**

  - 2X variance in employer satisfaction (Danielson et al., 2006)

  - Most impactful: interpersonal, business, & problem-solving skills

Background: VetMed Education

NAVMEC supported by 75% of academia & 82% of others surveyed (mostly employers)

Competency-Based Veterinary Education (CBVE) – MARCH 2018 Progress

- Outcomes-based, learner-centered framework
- 9 Domains:

1. Clinical Reasoning and Decision-making
2. Individual Animal Care and Management
3. Animal Population Care and Management
4. Public Health
5. Communication
6. Collaboration

7. Professionalism and Professional Identity
   7.2 Practices time management
   7.4 Engages in self-directed learning & career planning
8. Financial and Practice Management
9. Scholarship
   9.1 Evaluates health-related information

- 8 Entrustable Professional Activities (EPA)
- Still working on: Milestones, Assessments

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Summary of the Problem

- Aquatic animals are *not specifically included on the licensing exam*

- Jobs outside of large and small animal medicine (private practice) are *not well researched*

- Overall, the essential curriculum components of preparing AAH practitioners is unknown and thus, are *not included in curricula*

Procedure & Demographics

3 phase sequential, explanatory mixed methods study:

- Employer Questionnaire: 41 items
  - Response rate = 68/94 (72%)
  - US = 83%; Canada = 11%; Worldwide = 6%
  - Veterinarians = 88% (30% Diplomates) / Graduate degrees = 47%
  - Mean years of experience = 19.5

- Recent Graduates (RGs) Questionnaire: 36 items
  - Response rate = 25/29? (86%)
  - U.S. Grad. year: 2008 – 2014 (avg. 2011)

- Semi-structured Interview Guide: 12 items
  - 6 RG interviews

All phases underwent IRB review and approval – #2013-U-1219 #2015-U-0976

Demographics: Employers

- 32% worked for more than 1 organization type

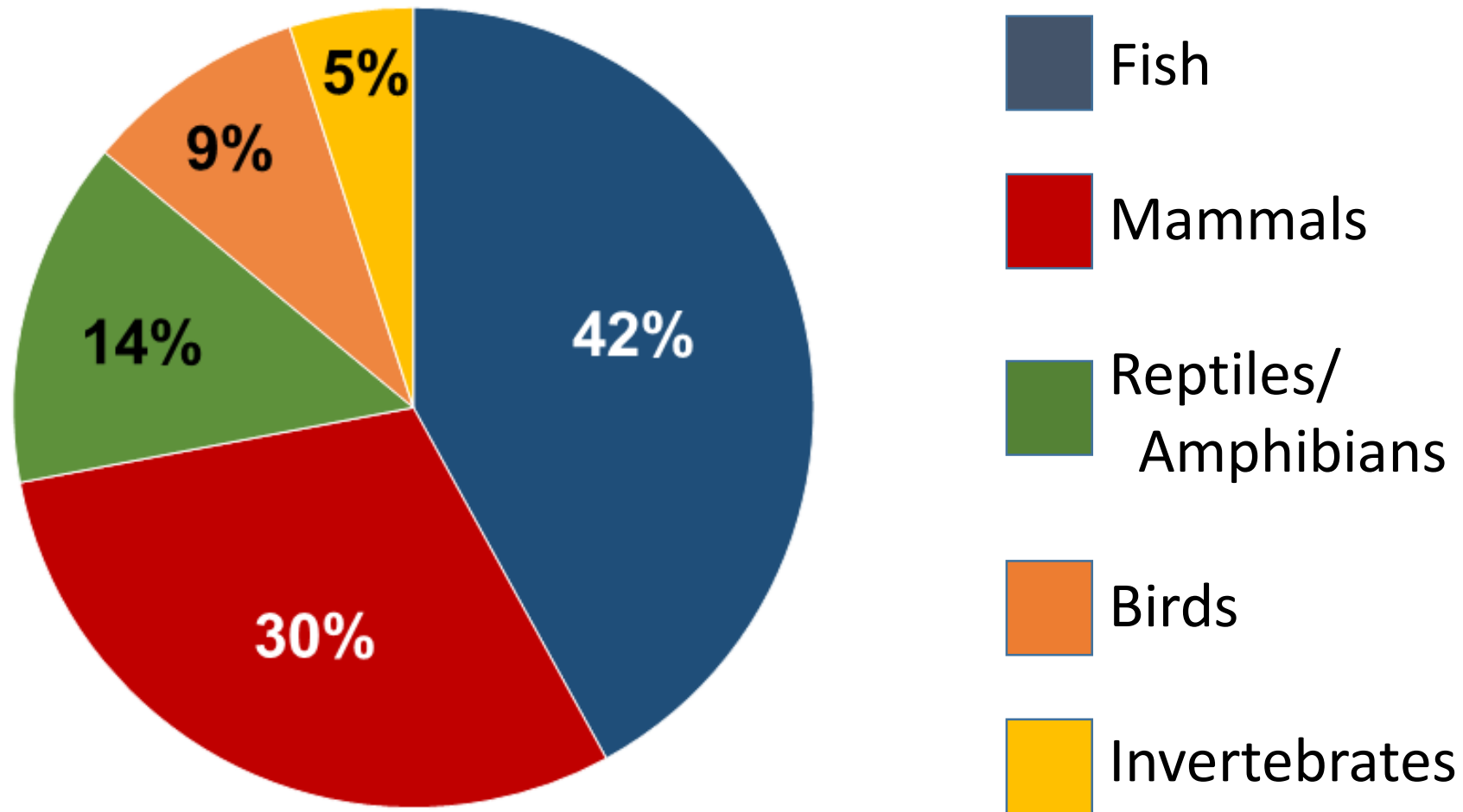|	Government Agencies	Academia	Small Businesses	Corporations	Non-Profits
Employers contacted, *N* = 94	21	16	21	16	20
Responses, *n* = 66; organization total = 97	17	20	24	12	24
1° organization (response rate)	14 (21%)	12 (18%)	15 (23%)	10 (15%)	15 (23%)

Demographics: RGs

- 24% worked for more than 1 organization type

	Government Agencies	Academia	Small Businesses	Corporations	Non-Profits
Responses, *n* = 25, organization total = 35	6	8	2	3	15
1° organization (response rate)	3 (12%)	8 (32%)	2 (8%)	1 (4%)	12 (48%)

Results

Vet employer time spent on each taxon
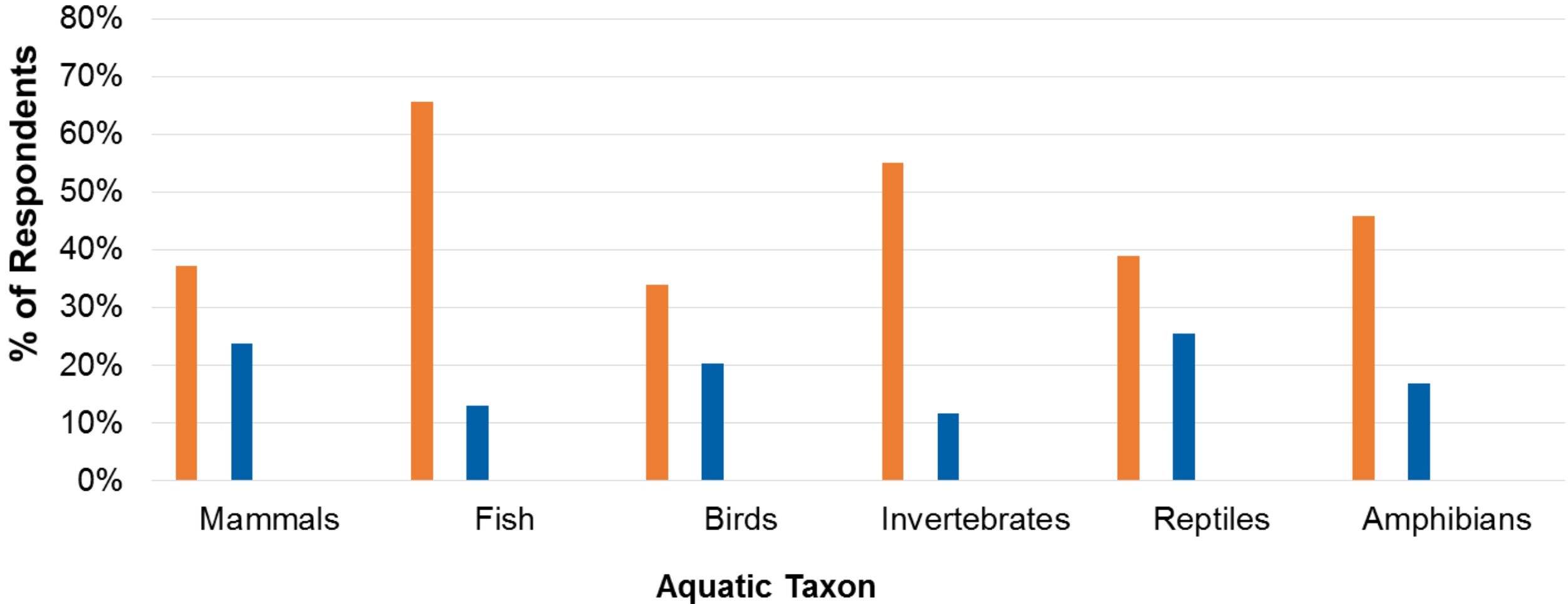
- Fish — 42%
- Mammals — 30%
- Reptiles/Amphibians — 14%
- Birds — 9%
- Invertebrates — 5%

Level of meeting the needs of the position

Legend: E Below (orange), E Meets (blue), E Exceeds (green)

Y-axis: % of Respondents (0% to 80%)

X-axis: Aquatic Taxon — Mammals, Fish, Birds, Invertebrates, Reptiles, Amphibians
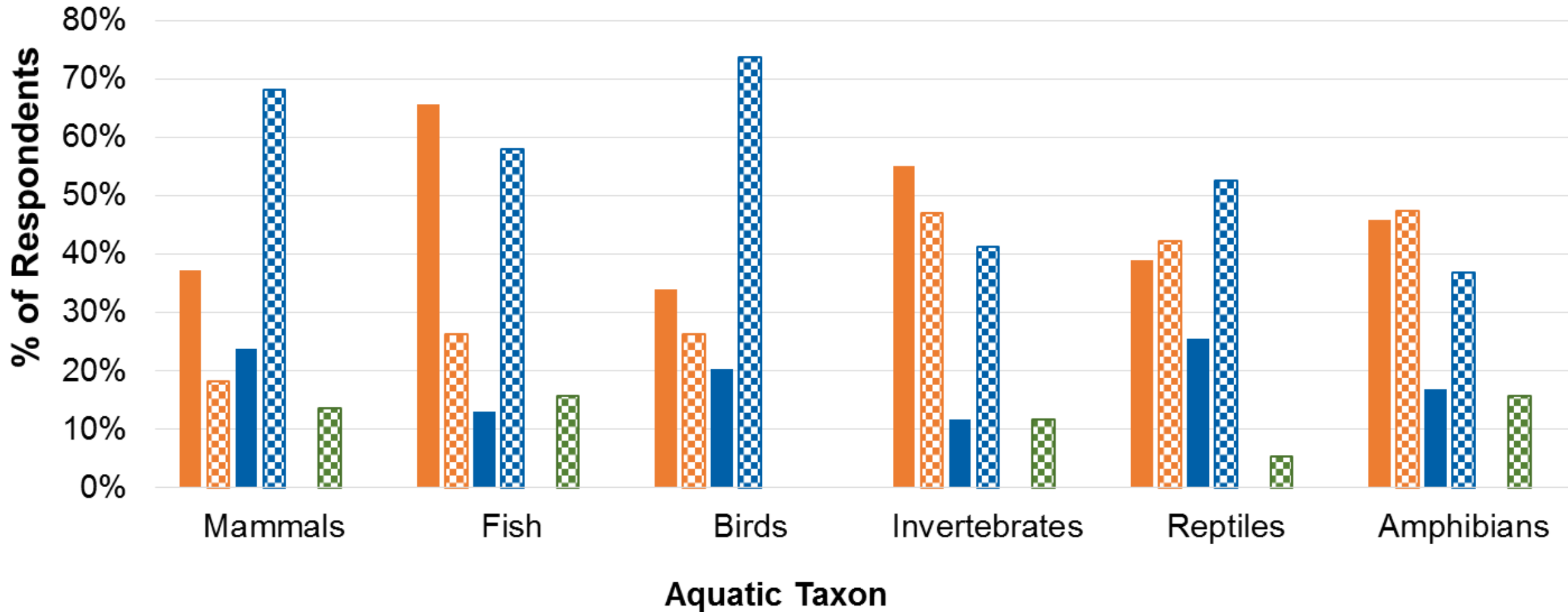
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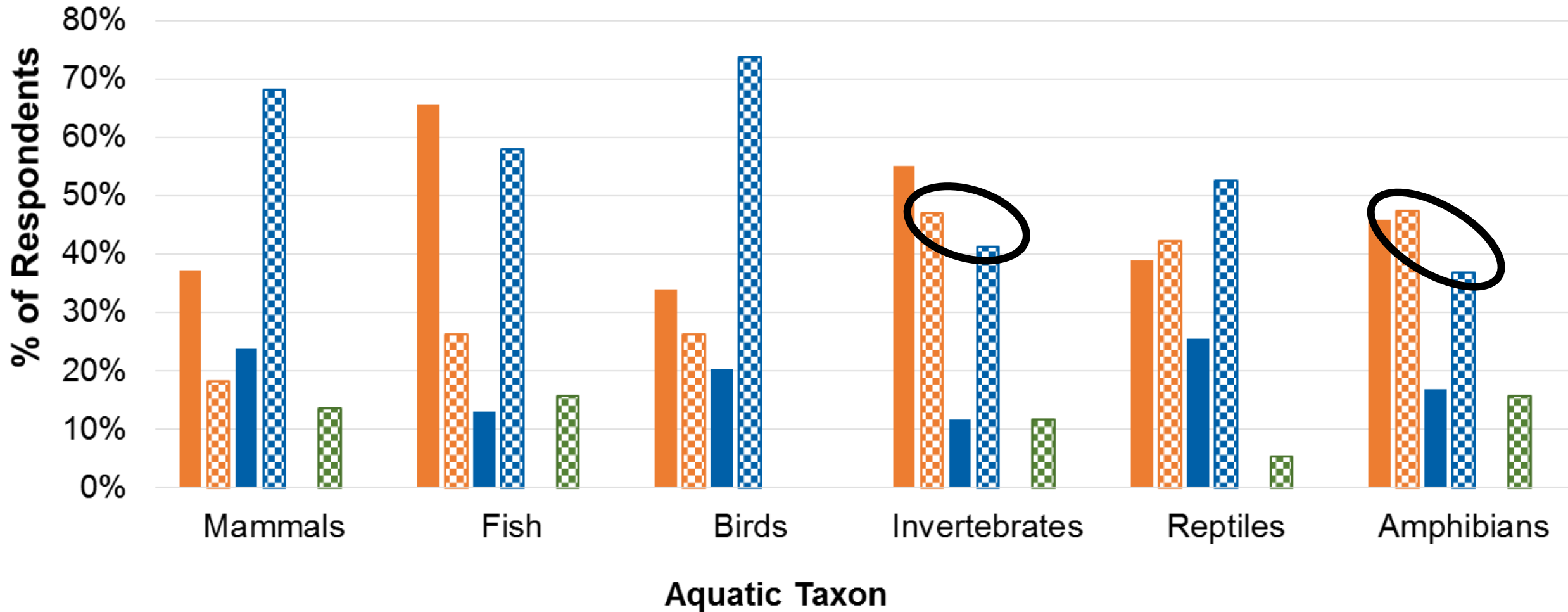
Employer Results
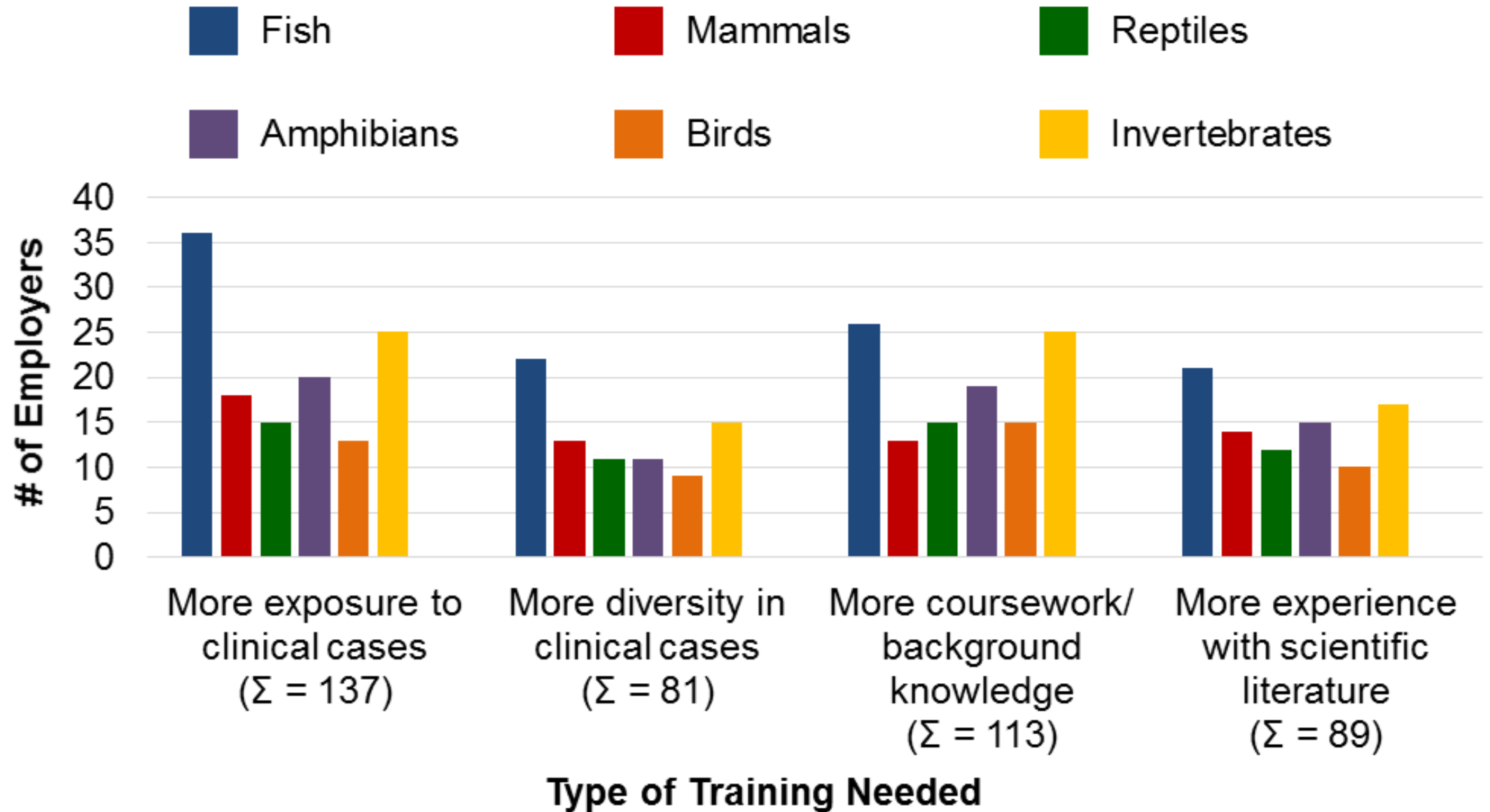
RGs Results
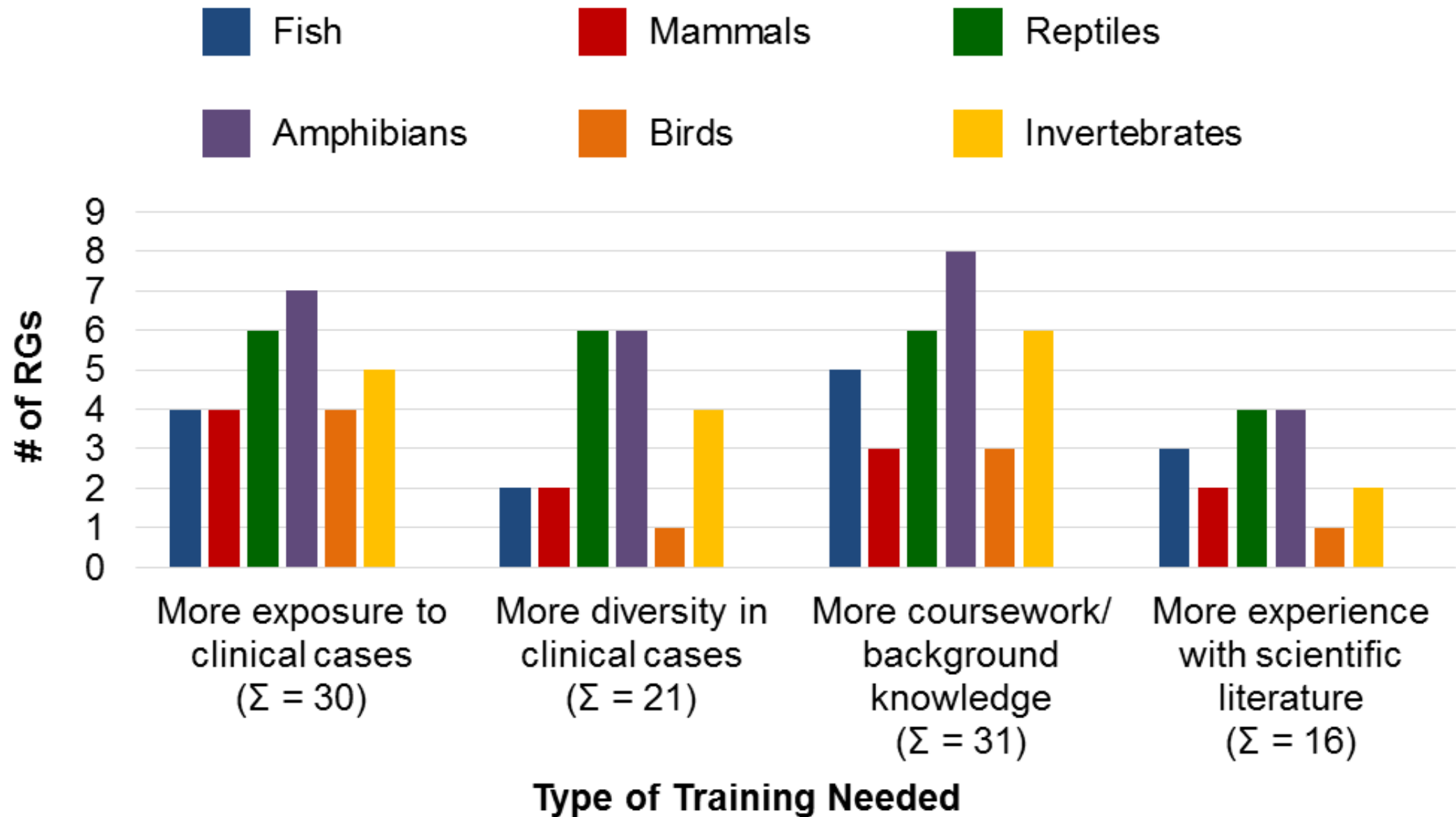
Interviews: Active learning "Hands-on"

- Highly valued
- Outside of the classroom and case-based learning

"we were also down the coast and doing necropsies on dolphins and all these types of things. That was huge. That's stuff that I could never even learn how to do, or become comfortable with, if we didn't take that time, if we didn't drive three hours to the beach and do what we did."

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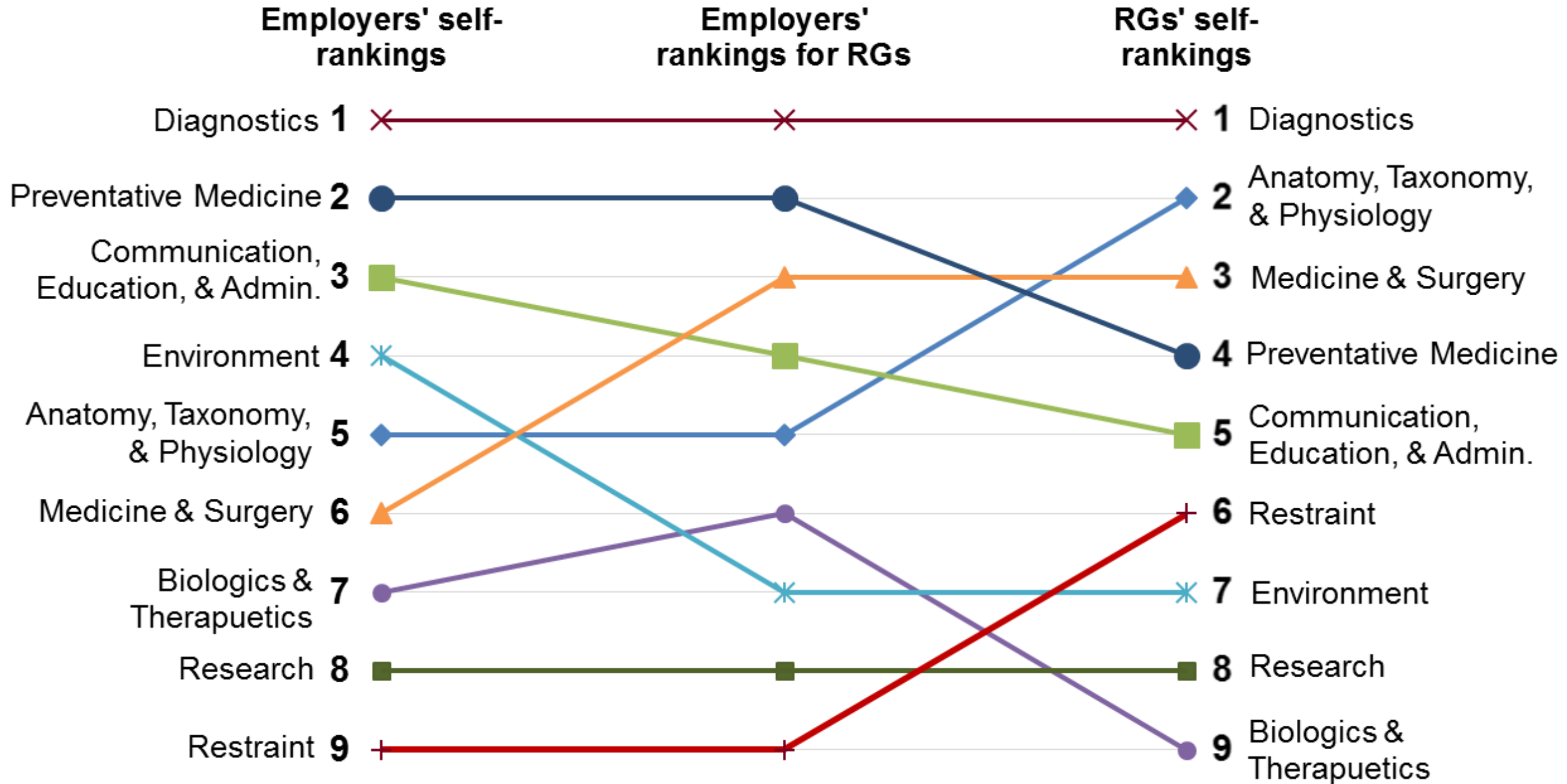
- One interviewee said a balance is needed though, as she decided **not** to attend a school with a fully case-based curriculum after visiting for a day.

Importance

Employers' self-rankings | Employers' rankings for RGs | RGs' self-rankings

1 Diagnostics — 1 Diagnostics

2 Preventative Medicine — 2 Anatomy, Taxonomy, & Physiology

3 Communication, Education, & Admin. — 3 Medicine & Surgery

4 Environment — 4 Preventative Medicine

5 Anatomy, Taxonomy, & Physiology — 5 Communication, Education, & Admin.

6 Medicine & Surgery — 6 Restraint

7 Biologics & Therapuetics — 7 Environment

8 Research — 8 Research

9 Restraint — 9 Biologics & Therapuetics

Importance

Employers' self-rankings	Employers' rankings for RGs	RGs' self-rankings
Diagnostics **1**		**1** Diagnostics
Preventative Medicine **2**		**2** Anatomy, Taxonomy, & Physiology
Communication, Education, & Admin. **3**		**3** Medicine & Surgery
Environment **4**		**4** Preventative Medicine
Anatomy, Taxonomy, & Physiology **5**		**5** Communication, Education, & Admin.
Medicine & Surgery **6**		**6** Restraint
Biologics & Therapuetics **7**		**7** Environment
Research **8**		**8** Research
Restraint **9**		**9** Biologics & Therapuetics

Importance

Employers

		RGs
Honesty/Integrity **1**		**1** Work ethic
Teamwork/Interpersonal skills **2**		**2** Motivation/Initiative
Motivation/Initiative **3**		**3** Honesty/Integrity
Work ethic **4**		**4** Teamwork/Interpersonal skills
Communication skills **5**		**5** Communication skills
Analytical/Critical thinking skills **6**		**6** Analytical/Critical thinking skills
Flexability/Adaptability **7**		**7** Flexability/Adaptability
Time management **8**		**8** Time management
Detail-oriented **9**		**9** Detail-oriented
Computer/Technical skills **10**		**10** Computer/Technical skills
Business savvy **11**		**11** Business savvy
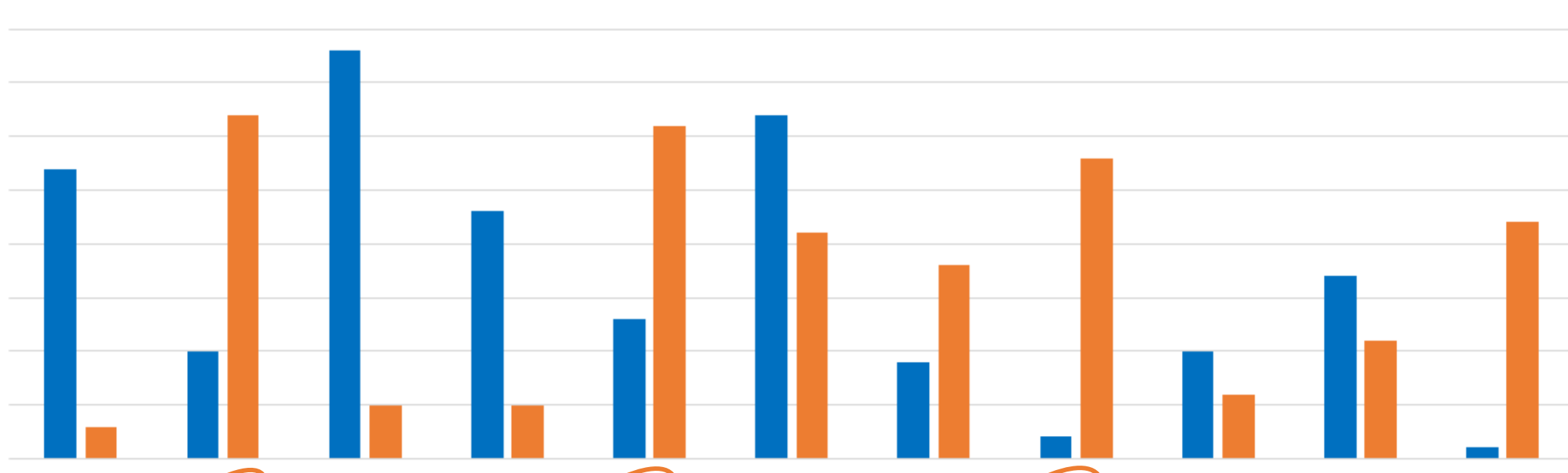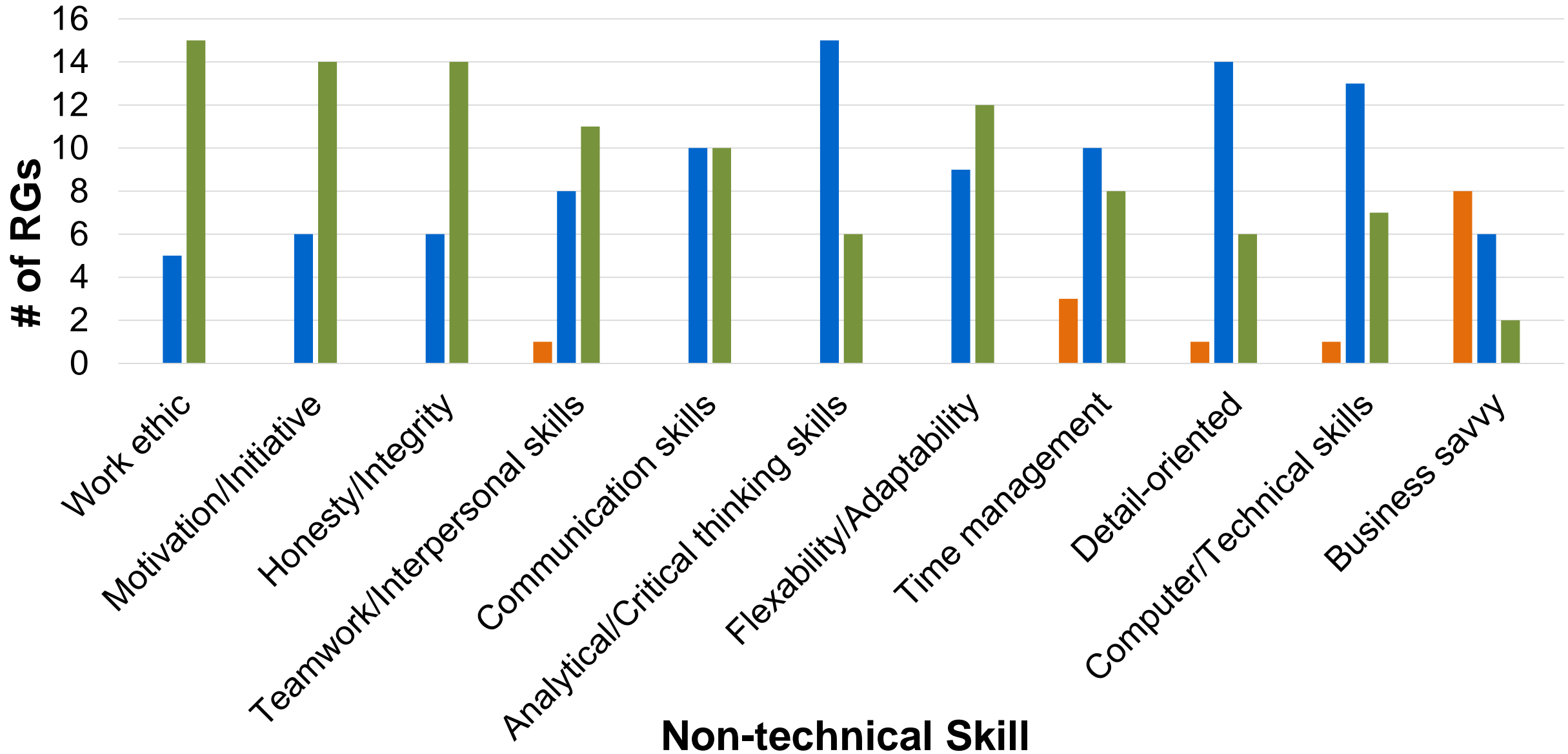
Interview: Communication training

"looking back on it, knowing what would be good for me now, back then I didn't have an appreciation for what those things were at the time. So I would never choose, with my own time, to do a client communication extra course on my own, but that should be something that is required 'cause it's good for me and I didn't know it at the time and so, I didn't know do it."

Interview: Communication training

"So you have these mock situations which did help because you have a one-on-one critique of the way you said these things were good or these things you can improve on. I think you got videotaped as well with an actual client and you sat down and reviewed it, was a part of that scenario. Which was great. …If they did more scenarios of emergency-type cases and situations when you have people that are very emotional, that's a very different scenario than most common role playing that we did, and that's really valuable. So you have to figure it out. How to deal with the emotions, the medicine, the finances- it's a lot."
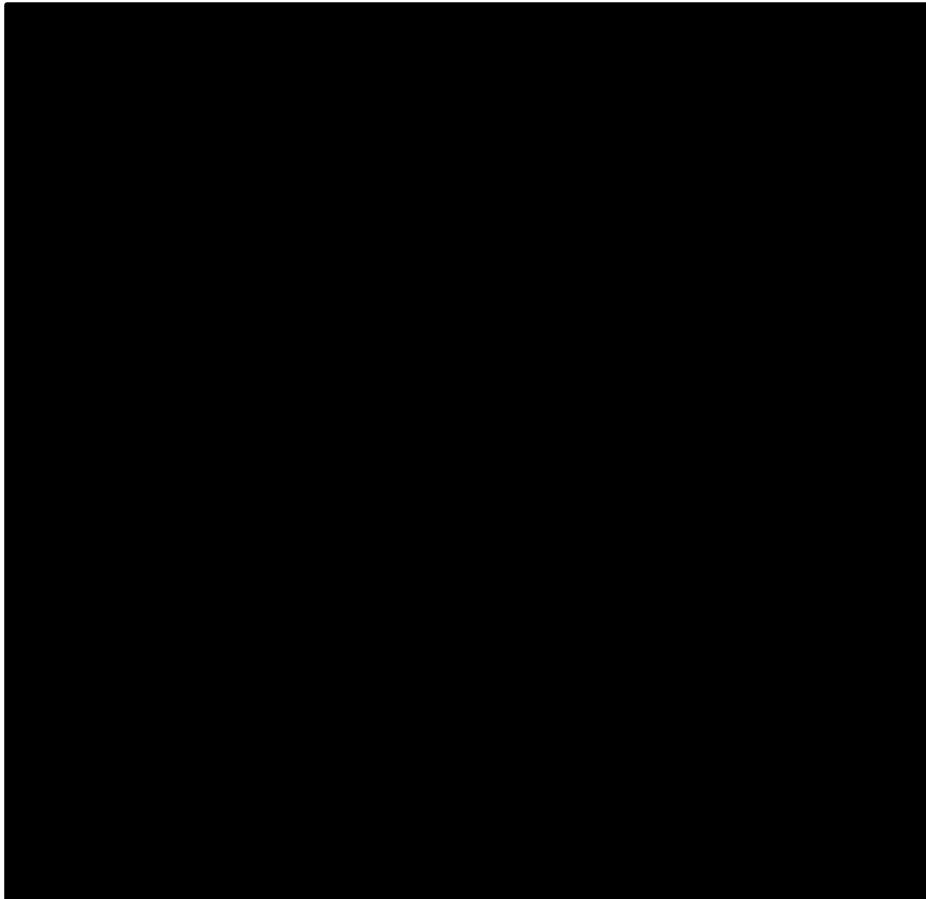
CBVE

- Domain: Communication
  - Competency 5.1 – Listens attentively and communicates professionally
  - Competency 5.2 – Adapts communication style to colleagues and clients
    - Ex: Engages clients in difficult conversations such as financial decisions and end-of-life care
  - Competency 5.3 – Prepares documentation appropriate for the intended audience

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- Domain: Collaboration (aka Teamwork)
  - Competency 6.1 – Solicits, respects, and integrates contributions from others
    - Ex: Invites input from others irrespective of role, hierarchy or background
  - Competency 6.2 – Functions as leader or team member based on experience, skills and context
    - Ex: Manages conflict
  - Competency 6.3 – Maintains ongoing relationship to provide continuity of collaborative effort
    - Ex: Follows up to determine if collaborator can implement the plan
  - Competency 6.4 – Demonstrates inclusivity and cultural competence

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Problem-solving

■ Memorized knowledge/ immediate recall

■ Other (Ex: familiar with accessing and critically evaluating publications, consults specialists, etc)
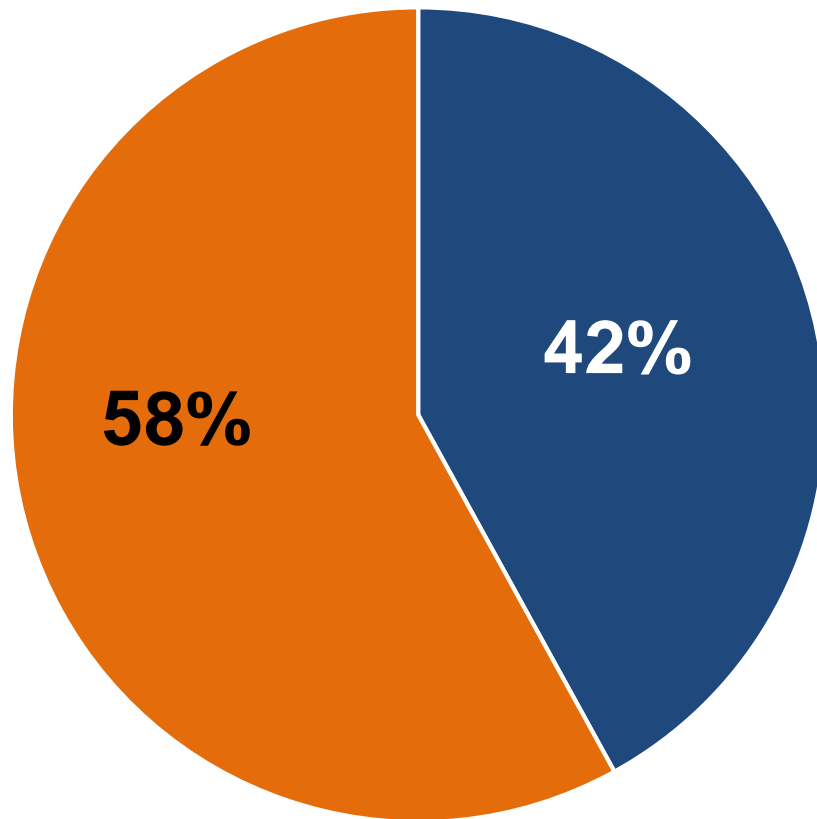
Results: Employers & RGs

Problem-solving

- Memorized knowledge/ immediate recall

- Other (Ex: familiar with accessing and critically evaluating publications, consults specialists, etc)

42%

58%

Between three interns with advanced beginner knowledge in aquatic animal medicine which would be more valuable?

A. Intern A who has additional clinical competencies in aquatic animal medicine (from 1 year work experience)

B. Intern B who has additional clinical competencies in small animal veterinary medicine (from 1 year of work experience)

C. Intern C who has additional abilities to effectively use educational resources (critically reviews scientific literature, more familiar with aquatic medicine resources, seeks specialist advice, etc)
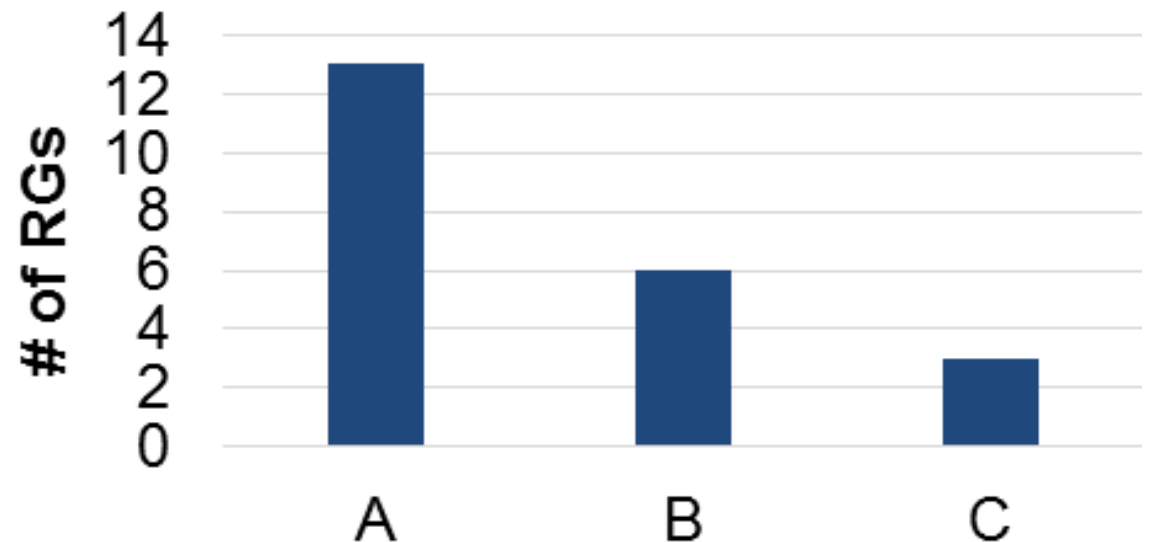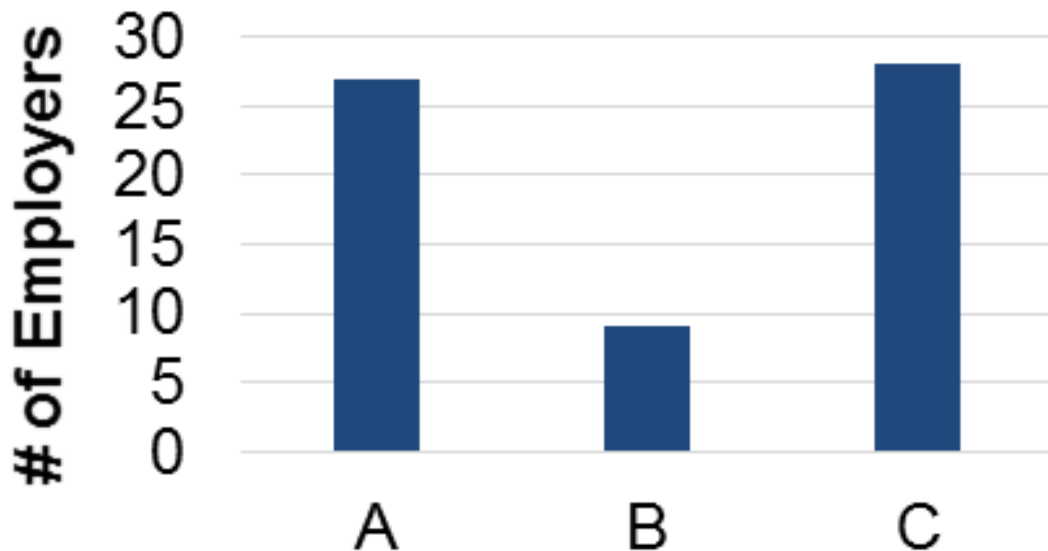
Interview Theme: Research

- Evaluation of research even if you're not conducting it

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9. Scholarship

- 9.1 Evaluates health-related information
  - Retrieves and evaluates information based on research principles
  - Analyzes information for accuracy, reliability, validity and applicability
- 9.2 Integrates, adapts and applies knowledge and skills
  - Ex: Applies literature to solve clinical or scientific problems (e.g., evidence-based practice)

CBVE

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7. Professionalism and Professional Identity

- 7.4 Engages in self-directed learning and career planning
  - Engages in self-directed learning as a foundation for life-long learning
  - Identifies and undertakes professional development to meet learning needs
  - Uses appropriate resources for learning and decision making (e.g., information technology, consultation with colleagues)
  - Compares career paths and weighs professional and personal rewards (e.g., financial implications)

Results: 5 year hiring report

Experience level	# (internship)
Brand-new DVM graduate (within 3 months of graduation)	10+ (10+)
DVM with <1 year of relevant work experience	10 (10)
DVM with 1 year of relevant work experience or a relevant internship	17+ (16)
DVM with 2 - 4 years of relevant work experience/internships	24+ (22)
Recently completed residency training and minimal other work experience	6
DVM with 5 - 9 years of relevant work experience/internships	12
Diplomate and work experience OR over 10 years of relevant work experience	10

Results

Job satisfaction levels of recent graduates ($n = 24$, $M = 5.96$, $SD = 1.12$)	
Satisfaction Level	**# of Respondents**
Extremely Dissatisfied	0
Dissatisfied	0
Somewhat Dissatisfied	1
Neutral	2
Somewhat Satisfied	3
Satisfied	9
Extremely Satisfied	9

Results

	Very Unlikely	Unlikely	Some-what Unlikely	Undecided	Some-what Likely	Likely	Very Likely
Recent graduates' likelihood of following the same career path *if they could do it all over again* ($n = 22$, $M_{DVM} = 5.86$, $SD_{DVM} = 1.86$, $M_{AAH} = 6.32$, $SD_{AAH} = 0.95$)							
Obtain DVM	1	2	0	0	3	3	13
Pursue AAH career	0	0	0	1	4	4	13

Interview: Debt Awareness & Alt. Careers

- Debt Awareness:
  - Not in it for the money but need to realistic about living costs and tuition debt (multiple internship years is "financial suicide")
  - Could have been more proactive in vet school
  - "I knew how much vet school cost when I went to school, but you really don't have a good handle on the interest rate that applies as you go, 'cause when you graduate you are like, 'Oh my goodness, I owe *this*! I could own a house and I don't.'"
- Alternative career advice included:
  - Consider if you would be happy as a non-AAH vet (if not, vet school is not a good idea) as well as non-vet AAH careers
  - Try a lot of different paths and be open to change
    - So many pros and cons to each career

Interview: Mentors

- Mentors were vital to preparedness (in internships too)

"I have more and more students coming to me looking for opportunities. I don't take them lightly, I really do think mentoring is a big part of how I got to fulfill my greatest aspirations, and it was not necessarily because I'm special, it was because my mentors were special… I will never be as good a mentor as the ones that I had, 'cause they were so amazing, but to just try to emulate that."

Conclusions

- AAH veterinarians often work for more than 1 organization
  - Further research on why ($, part-time only needs), impacts on job market
- Technical and non-technical skill development is needed for RGs
  - Fish should be emphasized more (model job analysis ratio)
  - RGs are focused on basic skills more so than employers (ATP & restraint)
  - Formal non-technical skill training should be required- include collaboration aka teamwork/interpersonal; higher-order communication; time management
- High number of internship positions is concerning
- Encourage instructors to use active learning strategies
- CE opportunities should be offered to target known gaps

Further Research Needs

- Veterinary workforce analysis on multiple jobs
- Baseline data on technical and non-technical skill levels of first-year vet students (formative evaluation of curriculum changes)
- Longitudinal study of AAH employment (placement of interns)

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- **UF AAH Collaborators:** Drs. Iske Larkin and Ruth Francis-Floyd

- EVERYONE WHO TOOK THE SURVEY!

THANK YOU!

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Recent Graduates:

- "the salaries that we, I say 'we' as a veterinary community, are either offering or willing to accept, sometimes I think it's really sad … I think they are a bit of a joke. For some of these positions where they are asking for someone to have all of this experience and then they are offering starting salaries [of] $65,000 and I'm like, 'Are you kidding me?'"

- "there are so many people out there who contribute in significant ways and they are not veterinarians… Aquatic Animal Health is not just veterinary medicine, it is the whole team of people involved in that."

Demographics: RGs

Alma mater	# of Respondents
University of Florida	7
University of California	5
North Carolina State University	3
Texas A&M University	2
Iowa State University	1
Kansas State University	1
Michigan State University	1
The Ohio State University	1
Tufts University	1
University of Missouri	1
Virginia Maryland CVM	1
Western University of Health Sciences	1

Employers' rankings for RGs

1 Diagnostics
2 Preventative Medicine
3 Medicine & Surgery
4 Communication, Education, & Admin.
5 Anatomy, Taxonomy, & Physiology
6 Biologics & Therapuetics
7 Environment
8 Research
9 Restraint

1. Environment (18%)

2. Medicine and Surgery (17%)

3. Preventative Medicine (16%)

4. Anatomy, Taxonomy, and Physiology (13%)

5. Diagnostics (12%)

6. Restraint (11%)

7. Biologics and Therapeutics (9%)

8. Communication, Education, and Admin. (3%)

9. Research (1%)