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1 Exploring the use of a novel self-assessment employability questionnaire to evaluate  
2 undergraduate veterinary attainment of professional attributes. An explanatory mixed  
3 methods study.

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## 6 **Abstract**

7 With the move to outcome-based education for professional degrees, the emphasis has  
8 been put on defining what constitutes competencies for that profession. A review of the  
9 literature on professional competencies shows the development of professional frameworks  
10 that encompass knowledge, clinical skills, professional skills and professional attributes  
11 regarded as necessary for employment of veterinary graduates. It follows that veterinary  
12 education has a responsibility to ensure students have these professional competencies.

13 This study uses an explanatory mixed-method approach to determine whether veterinary  
14 students at the University of Glasgow attained professional skills and attributes. Using a  
15 publicly available employability framework developed as part of the Vetset2go project a  
16 quantitative comparison was made between students of different gender and students from  
17 separate year groups. Focus groups from these year groups explored the potential reasons  
18 for the scores and where the employability attributes are acquired. Participants were asked  
19 to provide feedback on the usefulness of the employability self-assessment tool.

20 Analysis of the data showed there is a tendency for self-confidence to score low and  
21 trustworthiness high. Fourth-year students tend to score themselves lower for each  
22 attribute than second-year students. Results indicate that students are aware of the

provision of teaching interventions for the development of certain attributes however they feel some attributes are gained through experience and recognise the importance of school culture; University provides a socialisation period for professional identity. As self-confidence is important for well-being and for bringing value to future employers, ways to improve this attribute should be considered.

## **Introduction**

The goal of an outcome-based veterinary curriculum is to produce veterinary graduates suitable for future engagement in the veterinary profession by using the process of competency-based education to acquire skills, knowledge and attitudes to produce the final product. With the move to outcome-based education for professional degrees, the emphasis has been put on defining what constitutes the essential competencies for a profession.<sup>1</sup> These competencies go beyond technical skills and include many other qualities of professional behaviour.<sup>2</sup>

Veterinary educators have been emphasising that veterinary education should evolve to ensure it produces veterinarians who meet the requirements of future employers along with current and future societal needs.<sup>3,4</sup> It is essential that graduates meet employers' expectations. The 2017 American Veterinary Medical Association and Association of American Veterinary Medical Colleges' report on The Market for Veterinary Education asserted the importance of graduates' worth to employers as a critical factor in improving starting salaries and reducing the debt to income ratio of veterinary graduates.<sup>5</sup> Thus the opinion of employers of new graduates should shape veterinary programmes. The 2017 Vet School Council employer survey, which focused on the Royal College of Veterinary Surgeons

(RCVS) day one competencies, showed a lack of business competency and resilience in graduates.<sup>6</sup> This supports the findings of Bachynsky et al who, five years previously, found that employers had a low opinion of business skills of recent graduates.<sup>7</sup> Bachynsky et al. suggested there should be more emphasis on business skills in the veterinary curriculum.<sup>7</sup> Indeed, in line with the North American Veterinary Medical Education Consortium's (NAVMEC) identification of business skills as a core competency, veterinary colleges at the University of Pennsylvania, Colorado State University, North Carolina State University, Iowa State University, and Texas A&M have implemented dual degree programmes that include a Master of Business Administration.<sup>8,3</sup>

Caution should be exercised when changing educational programmes to meet the needs of the employer. Thilakaratne and Kvan discuss the difference between a professional degree and a vocational degree citing Eraut that professional competence is associated with special intellectual capabilities or professional skills rather than practical skills and that teaching should not be dictated by the requisite 'occupational' skills.<sup>9,10</sup> Naturally, professional accrediting bodies focus on attainment of requisite knowledge and 'technical' skills, arguably the 'occupational' skills, as these are the skills that ensure safety to practice. However, it is extremely important that veterinary medical educators ensure graduates attain less tangible professional skills and are suitable for the profession.

The veterinary profession has to continually evolve its definition of professionalism and graduate competencies. Bok et al. produced a veterinary professional framework (Vetpro) and stated that despite the RCVS clearly defining day one competencies there was not an

67           *“integrative approach to curriculum development underpinned by a framework of*  
68           *competencies that will sustain today’s and tomorrow’s veterinarians throughout*  
69           *their career”.*<sup>11</sup>

70   They encompass the skills that enable development of the professional veterinarian and not  
71   just the occupational competencies required for a vocation. Bell, Cake and Mansfield  
72   develop this further with the suggestion that the competency frameworks can

73           *“obscure the aim of producing not only competent but also successful and satisfied*  
74           *veterinarians”.*<sup>2</sup>

75   This reflects the danger of only focusing on the requirements of the profession and not on  
76   the needs of the graduating professional. The VetFutures action plan recognises the  
77   importance of establishing the skills and attributes that enable development of both the  
78   individual graduate and the profession as a whole.<sup>12</sup> It also states the importance of  
79   addressing the current disconnect between the expectation of new graduates and the  
80   reality of the veterinary profession with many graduates feeling their degree did not  
81   prepare them very well for the job in hand.<sup>13</sup>

82   However, when considering disillusionment of young veterinarians, the disconnect between  
83   student expectation and reality of the career goes beyond the accumulation of specific  
84   skills.<sup>14</sup> Exactly as Bell et al suggest, in order to produce satisfied veterinary graduates, the  
85   profession needs to go beyond competence and focus on employability of its graduates  
86   where employability is defined as,

87           *“a set of achievements, skills, understandings and personal attributes which enable*  
88           *an individual to gain employment and be successful which benefits themselves, the*  
89           *workforce, the community and the economy”.*<sup>2,15</sup>

90   The Vetset2go project has defined, through a multi-stakeholder consensus process, a list of  
91   attributes considered important for employability and success in the veterinary profession.<sup>16</sup>

92   The project has produced a veterinary employability framework that encompasses  
93   knowledge, skills and attitudes, considered important for the profession and the individual  
94   that will allow the graduate to gain successful employment of benefit to themselves.

95   The medical profession has invested considerable energy in recognising its key values and  
96   how these are shaped by both the profession, and society.<sup>17</sup> However, the defining of  
97   professional competencies has led to the question about how to train and assess students in  
98   these domains.<sup>3</sup> Some of the more easily defined elements like communication skills,  
99   teamwork, problem solving are easy to introduce in medical curricula and there are suitable  
100   training and assessment methods available. The more indefinable attributes of  
101   professionalism remain challenging to teach and assess.

102   Hodgson et al argue that the three decade lag in the medical profession from defining  
103   professional competencies to widespread adoption into medical education most likely  
104   occurred because there were no initial competency benchmarks for specific competencies  
105   or defined methods for teaching and assessing them and that the same mistakes should not  
106   be made in veterinary education.<sup>3</sup> The North American Veterinary Medical Education  
107   Consortium (NAVMEC) released a report in 2011 with a list of competencies they deemed  
108   necessary for the graduating veterinary student. Of the nine core competencies, seven were

classified as non-technical or professional and Hodgson puts forward various ideas for teaching and assessing them.<sup>3,8</sup>

The current literature supports the theory of outcome-based education for veterinary curricula. There is increasing recognition that this goes beyond knowledge acquisition and technical competency but that the aim should be to produce graduates who bring value to their employers, continue to develop and learn alongside societal requirements and are not disconnected from the realities of the profession. Teaching of some of these attributes is challenging but it is possible that they may be gained from experiences external to the formal curriculum.<sup>18</sup> This is in line with the theory of professional identification where individuals relate to the professional group with which they are associated through social construction. Socialization, defined as the social learning process by which a person acquires specific knowledge and skills that are required in a professional role, plays an important role in shaping identification.<sup>19</sup> Under this framework some researchers have theorized that the informal curriculum medical residents are exposed to during socialization may overpower some of the more technical 'official' curriculum.<sup>20</sup> However, universities have also seen the importance of introducing programs that develop practice-based pedagogical curricula that prepare graduates for the world of work and contribute to individuals Professional Identity development.<sup>21</sup>

The University of Glasgow veterinary degree programme (Bachelor in Veterinary Medicine and Surgery; BVMS) has been structured to integrate clinical and basic science subject areas alongside professional and clinical skill development with the goal of producing graduates suitable for the veterinary profession. Skills such as communication, teamwork and reflection are formally assessed but little is known about important employability attributes

like resilience, self-confidence and respect despite awareness that these are attributes important for veterinary graduates to have. The current formal assessment of students' knowledge and clinical skills does not fully evaluate whether the re-structured curriculum meets its desired outcome of producing graduates suitable for the veterinary profession. Within the theoretical framework of professional identification and socialisation, this study uses a quantitative tool to establish how well students identify with a list of attributes considered important for the profession. A qualitative approach is then employed to investigate how and where students attain these attributes through the programme assuming that there will be multiple socialisation factors that interact in the development of professional attributes. Professional identification may also bring value to the individual reducing uncertainty and providing self- enhancement.<sup>22</sup> Identifying with a valued profession allows individuals to achieve and maintain positive images of themselves.<sup>23</sup> The aims of this study are therefore, to explore whether the BVMS programme at the University of Glasgow currently enables its graduates to develop the employability attributes considered important by multistakeholders for a career in the veterinary profession and where students believe these attributes are attained. As a pilot study using the vetset2go framework the aim was also to see whether students can relate to the professional attributes and therefore reliably score themselves and whether this veterinary employability self-assessment tool is of benefit to students.

## **Methods**

*Study Design* – An exploratory mixed-methods approach was used to explore the attainment of professional attributes in BVMS undergraduates. In order to gain a general overview of BVMS students it was deemed necessary to sample a large proportion of each year group by



means of a questionnaire. However, a survey alone would not have given the necessary information to interpret how attributes are developed; therefore, this was followed up with focus groups for each year group after analysis of the quantitative data.

*Instrument* - The questionnaire was derived from the Vetset2go self-assessment employability instrument.<sup>16</sup> This is an online self-assessment tool developed from a multinational project looking at existing and commissioned research to establish an employability framework. The project explored the expectations of veterinarians, employers, clients, employees and other stakeholders through mixed methods research, including two large surveys and a Delphi process. This established eighteen defined attributes considered important for the veterinary profession for an individual to grade themselves against on a sliding scale from 'an area for development' to 'an area of strength'. For this study the instrument was converted to a paper-based questionnaire; each attribute was presented with its definition and students were asked to rank themselves on a Likert scale from 1 to 10 (appendix 1). A comment section was provided after each question.

*Participants* – All students enrolled on the BVMS programme were invited to complete the survey in order to get as large a sample population as possible as student response rate for questionnaires in our institute is typically low. Depending on availability of the students the invitation to participate was either done face-to-face (students from BVMS 2,3 and 4) or electronically (students from BVMS 1 and 5). Consequently, the overall sample for the quantitative portion of the study constituted a convenience sample.

Students were asked to volunteer from each year group to participate in a focus group. The anonymity of the questionnaire prevented purposive sampling and instead relied on convenience sampling. Focus groups consisted of groups of 6 to 10 students and were

separated into different year groups. The focus groups were structured by a series of questions to explore several themes from my own experiences and ideas from the analysis of the quantitative data. As the self-assessment tool has not previously been used in students, questions were also asked to explore why students graded themselves in a particular way in order to provide additional validity evidence by researching the response process. An observer attended the focus group to audio record the interviews and take additional notes. This allowed the investigator/mediator to focus fully on the discussion and prevented biased note-taking. At the end of the focus group meeting the notes were read back to the participants to confirm their agreement. Recordings were used so that students could be quoted verbatim to give transparency to the research and conclusions of the content analysis.

*Data analysis* - Descriptive statistics using Microsoft® excel data analysis were used to analyse the quantitative data. No inferential statistical analyses of the data were performed. Initially attribute scores were compared for different genders. This was followed by comparing different attribute scores for different year groups. Thematic coding was used to analyse the qualitative data to produce a number of emerging themes.

Ethical approval for this study was granted by the College of Social Sciences, University of Glasgow, application number: CSS/SOE/2017/014

## **Results**

### *Quantitative results*

The response rate for all students on the BVMS programme was 51% (315/615). There was 52% representation of females (253/490) and 44% representation of males (55/125).

Although there was a high response rate from students from the 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> years of the BVMS programme, there was a poor response from students from the 1<sup>st</sup> and 5<sup>th</sup> years who had received the questionnaire electronically. Overall responses are shown in Table 1. Not all students answered all questions.

Initially, self-evaluation scores from all students were used to compare different attributes. For all students on the BVMS programme trustworthiness, and commitment had the highest median score (9) whereas emotional competence, application of expertise, problem-solving and self-confidence had the lowest median score (7)(Figure 1). There were some differences between the responses from males and females with males scoring higher in emotional competence and problem solving and lower in commitment and managing workflow (Figure 2).

The self-evaluation scores were then separated into different year groups for comparison. Using descriptive statistics to compare attribute scores for each year group, 2<sup>nd</sup> year students generally scored themselves high compared with other year groups whereas 4<sup>th</sup> year students generally scored themselves low compared with other year groups for more than 75% of the attributes (Figure 3).

#### *Qualitative results*

Free comments from the questionnaire and comments from the focus group discussions were grouped into common themes (Table 2) in an attempt to analyse why students had scored in a particular way.

220 It seemed self-confidence was scored low for a variety of reasons. One of these appeared to  
221 be because they were not confident in a certain skill as illustrated by the following comment  
222 from a questionnaire:

223 *'I am confident I will be a good vet and especially be practically useful in my first few years of*  
224 *practice, but I am really not confident at all that I've learned what I need to in order to make*  
225 *clinical decisions responsibly'*

226 It could be argued that this is a misinterpretation of the question as a person can still be  
227 self-confident even if they are aware of their own limitations. This is demonstrated by a  
228 comment from a student who scored self-confidence high on the questionnaire:

229 *'I may not be super confident in my veterinary knowledge/skills but I am confident in my own*  
230 *abilities to be a quick learner once I am out working as a vet.'*

231 Other reasons from the focus groups for scoring self-confidence low was to *'not wanting to*  
232 *appear over confident'* again an illustration of not appreciating what is meant by self-  
233 confidence and identity.

234 Other reasons for variations in scores other than misinterpretation of the attribute were too  
235 broad a description for the attribute. For example, for application of expertise one student  
236 commented:

237 *'For compassionate handling alone, I would be a 10; however, for inspiring confidence in my*  
238 *expertise knowledge, I still need a lot of work' for application of expertise.'*

239 This occurred multiple times for application of expertise and is likely because the question  
240 includes three distinct skills. The student therefore has to give an overall score which  
241 encompasses their ability in all of these.

242 Other comments suggested that the student found it difficult to score the attribute in their  
243 current situation:

244 *'It's hard to tell before actually getting into practice'*

245 *'It's really hard to say while still in school. I think I will probably rate this higher within my*  
246 *first year of practice'*

247 *'I am unsure as to how I will react emotionally as a vet, as a vet student I feel as though I*  
248 *have good emotional competence'*

249 It was evident that some attributes had been developed through participation in the  
250 programme and students were able to match a number of attributes to teaching  
251 interventions:

252 *'Glasgow emphasises teamwork with group projects every module'* for collaboration and  
253 teamwork.

254 *'I think Glasgow has reinforced my natural inclination to be honest with patients and take*  
255 *responsibility with co-workers for any mistakes'* for trustworthiness.

256 They however believed some attributes were pre-existing although these were not  
257 considered to be inherent to gender or ethnicity:

258 *'I would argue that, while no skills are inherent, individuals may have a predisposition to*  
259 *develop certain skills.'*

260 *'I do not believe that age, gender, nationality or background automatically predicate the*  
261 *development of these professional skills, although they may contribute.'*

262 They felt that attributes were gained through experience, for example, applying to vet  
263 school, moving to a different country to study and going through the course.

264 *'I feel I possessed these qualities before attending Glasgow Uni'*

265 *'I don't think this attribute has anything to do with the course, but is a natural attribute of*  
266 *students high-achieving enough to have made it to vet school at all'*

267 *'I feel that I have developed my adaptability, commitment and sustainable engagement*  
268 *during the course, but not necessarily from the course. Moving to another country to attend*  
269 *a school where I knew one other human that was 4 years more advanced in the program*  
270 *forced me to adapt and deal with an incredible amount of uncertainty.'*

271 *'Simply moving overseas and starting the course was a realization of a big goal for me, and it*  
272 *built my confidence in myself that yes, I can indeed accomplish the things that I want to*  
273 *accomplish'*

274 Students commented that extra-curricular activities were useful for developing attributes  
275 and suggested that the culture of the veterinary school to encourage external activities  
276 (beyond extra-mural placements) played an important role in this:

277 *'The school's commitment to providing and supporting opportunities for students to develop*  
278 *themselves outside of veterinary medicine (sports, clubs, trips, pub-nights et cetera) all*  
279 *contribute to the development of self-confidence and identity, as well as sustainable*  
280 *engagement'*

281 From the free comments it appeared the students had a good understanding of the  
282 attributes and when asked in focus groups no-one was surprised at the inclusion of these  
283 attributes for veterinary employability:

284 *'I think the provided list is very appropriate, and don't disagree that each trait would be*  
285 *present in a highly effective and well-balanced vet. None were surprising.'*

286 They felt being presented with the survey gave them a good benchmark of professionalism  
287 although evaluating these attributes was a potential source of stress if they felt they were  
288 lacking in some way:

289 *'The list is nice to have as a checklist to reflect on how I'm progressing but can also be*  
290 *stressful if I feel I'm not living up to the expectations set before me.'*

291 However, one student felt it boosted his confidence that he would be a good veterinarian as  
292 the survey recognised attributes beyond academic skills which is typically the only way they  
293 are assessed. It was suggested that being presented with the questionnaire at an early stage  
294 of the programme would make them more aware of the attributes important for the  
295 profession and would help them work towards them:

296 *'I feel that this list would make a good introductory lecture or presentation during your first*  
297 *few months of veterinary school. As a student beginning fresh, this would have been a*  
298 *wonderful way to examine where my starting point was, and what areas that I would be*  
299 *able to recognize that I needed to work on.'*

300

## 301 **Discussion**

302 This study used the Vetset2go employability framework to see if the veterinary programme  
303 at the University of Glasgow helps students to attain specific professional employability  
304 attributes. The results of this study show that students are aware of the attributes and can  
305 relate many of them to teaching interventions within the programme albeit those within a

more technical realm. Attributes that are more difficult to teach and assess were recognised as being gained through experience. Although not directly from the programme this often included experience related to the programme such as applying and coming to veterinary school and participating in the programme. This is similar to the study by Moffett and Bartram where there was consensus among participants of student focus groups that resilience depended on upbringing and past experiences.<sup>18</sup>

This study aimed to show that employability attributes are attained or improved through the BVMS programme. This was shown in a previous study on technical and professional skills where feelings of competence generally increased with years of education for specific technical and professional items.<sup>4</sup> This however was not supported by the results of this study with 4<sup>th</sup> year students on the BVMS programme scoring themselves the lowest. This is likely a reflection of the students' stage in the BVMS programme and where they are on Miller's pyramid of competence. Second year BVMS students have completed the two-year pre-clinical phase and are confident that they have the required base knowledge for their stage of the programme and know how to perform various key skills. Fourth year students are about to embark on their final year which is comprised of work-based placements. Students will be required to demonstrate that they possess the knowledge and skills required to be an actual veterinarian; therefore, they may be self-evaluating themselves at a higher level of achievement. However, a curriculum level intervention at this stage could help build self-perception and confidence prior to students entering the final year of the course. A meta-analysis of student self-assessment showed that students in advanced courses appear to be more accurate assessors than those in introductory courses.<sup>24</sup> It could therefore be argued that 4<sup>th</sup> year students have a better understanding of what is required of a professional veterinarian and more realistically self-evaluate.



330 The greatest concern from this study is the lower scoring of self-confidence and identity. As  
331 noted in the report on the market for veterinary education self-confidence is valued by  
332 employers and is an important factor in starting salaries.<sup>5</sup> Therefore it is of paramount  
333 importance that students graduate with self-confidence. The lower scoring however may be  
334 a reflection on the validity of this employability framework to assess self-confidence as  
335 evidence of the response process suggests that some of the problem is not understanding  
336 what is implied by self-confidence so that the results are not a true reflection of actual  
337 confidence levels. However, from some of the free comments it was clear that some  
338 students had very poor self-confidence and self-esteem despite marking themselves high in  
339 other attributes. Anecdotally, this seems to be an ongoing problem in new graduates who,  
340 despite completing a post-graduation development phase are not left feeling any more  
341 confident about their abilities as a veterinarian. It is clear that as a profession we need to  
342 encourage and nurture self-confidence. However, if we are to do this, it is important to have  
343 a scale validated at measuring self-confidence similar to those available in other medical  
344 professions.<sup>25</sup>

345 Similar to Hillis and Grigg, this study shows that professionalism is learned from a wide  
346 range of sources.<sup>17</sup> Not only is the curriculum important in professional development but  
347 also the environment in which students learn. The culture of a working environment is  
348 extremely important; professionals within a teaching environment need to realise they act  
349 as role-models. Sullivan et al. constructed a framework for professionalism in surgery that  
350 included cultural competency, accountability and respect.<sup>26</sup> While describing this  
351 framework, they noted that undergraduates often observed a lack of respect in professional  
352 role-models and that this could impact negatively on attainment of this attribute. Sullivan  
353 suggests that teaching professional competencies in medical skills is the responsibility of

everyone working within the medical profession not only in what they teach but also how they behave.<sup>26</sup>

This study was intended to be a pilot study to see whether an employability framework with robust content constructs can be used to assess professional employability attributes in undergraduate veterinary students. This method could be used to evaluate whether an outcome-based curriculum meets its desired aim of producing graduates suitable for the veterinary profession. It relied on comparing students from different year groups to see if there was progression through the programme and would benefit from repetition using longitudinal, repeated measures, single cohort study that compares students' scores as they progress through the programme. The scores of the students were generally high and it would be interesting to see if scores remain the same once they graduate. Validity of the self-assessment tool would also be enhanced by determining whether higher scoring graduates are perceived by employers and clients to be superior and more satisfied veterinarians.

Prior to use in this study, the framework only had evidence of content for validity. This study provides additional evidence for assessing validity of the Vetset2go self-evaluation tool and shows areas where attribute definitions could benefit from modification. However, the grading of attributes in this study should be interpreted with caution as although the study showed that students can relate to the professional attributes they sometimes appeared to have been misinterpreted and therefore the grades may not be a true reflection. However, as self-confidence may be a problem for veterinary professionals and it has been shown to be an important factor for new graduates, future work to develop a valid and reliable psychometric instrument to assess self-confidence in veterinarians is appealing.

In conclusion, the Vetset2go framework could be used to highlight potential areas of a curriculum that could be enhanced in order to prepare students for engagement in the profession. For the University of Glasgow, the programme may benefit from interventions focusing on self-confidence and assurance of 4<sup>th</sup> year students.

The framework should be considered useful for students to make them aware of the attributes considered important for veterinary professionals. It may also help them recognise the importance of various interventions within the curriculum.

Veterinary educators should be aware that not only is the curriculum important for establishing key attributes but also the culture and behaviour within a school can play an important part. Support of external activities are likely to improve the development of certain attributes.

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## Figure legends

Table 1. The response rate of students from the different year groups. For second, third and fourth year there was a high response rate but for 1<sup>st</sup> and 5<sup>th</sup> year the student response rate was poor.

Figure 1. Distribution of student self-evaluation scores for different professional attributes. These are aggregate scores for students from all year groups showing that trustworthiness and commitment score higher than self-confidence.

Figure 2. Comparison of the median self-evaluation scores of female students with median self-evaluation scores of male students for each professional attribute.

Figure 3. Comparison of self-evaluation scores of each year group for each attribute. This shows that trustworthiness is consistently scored high by all year groups and self-confidence low. It also shows that students from the BVMS 4 year group score lower than the other year groups for the majority of attributes.

Table 2. Codes used for qualitative analysis.