1 **Title**
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3 The hidden curriculum of veterinary education: mediators and moderators of its
4 effects
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31 **Abstract**

32 The "hidden curriculum" has long been supposed to have an effect on students'
33 learning during their clinical education, and in particular in shaping their ideas of what
34 it means to be a professional. Despite this, there has been little evidence linking
35 specific changes in professional attitudes to its individual components. This study
36 aimed to recognise those components of a hidden curriculum at a UK veterinary school
37 that led to a change in students' professional attitudes, as well as identifying the
38 attitudes most affected. Observations were made of 11 student groups across 5
39 clinical rotations, followed by semi-structured interviews with 23 of these students at
40 the end of their rotation experience. Data were combined and analysed thematically
41 taking both an inductive and deductive approach. Views about the importance of
42 technical competence and communication skills were promoted as a result of
43 students' interaction with the hidden curriculum, and tensions were revealed in
44 relation to their attitudes towards compassion and empathy, autonomy and
45 responsibility, and lifestyle ethic. The assessment processes of rotations and the

46 clinical service organisation served to communicate the messages of the hidden
47 curriculum, bringing about changes in student professional attitudes, whilst student
48 selected role models and the student rotation groups moderated the effects of these
49 influences.

50 **Key Words**

51 Hidden curriculum, professional attitudes, clinical teaching, veterinary education,
52 clerkship format.

53 **Introduction**

54 Professional studies are now an accepted part of modern clinical education. Their
55 inclusion in the formal curriculum aims to address a perceived decline in moral
56 characteristics, such as altruism, as well as growing concerns over the ever-increasing
57 commercial pressures placed on clinicians. Formal education in professional, non-
58 technical skills is believed necessary to prevent the breakdown of medicine's social
59 contract; otherwise how can the health professions be trusted to regulate themselves
60 if they are likely to be acting in their own self interests rather than for the greater
61 good?[1,2] Although some have questioned whether the health professions have ever
62 actually achieved such selflessness or if this is simply a case of misplaced nostalgia,[3]
63 empirical studies have revealed a concerning decline in student moral reasoning and
64 empathy over the course of their medical education,[4,5] particularly during their clinical
65 years,[6,7] and at the institution under study the authors have previously established a
66 decline in the perceived importance of altruism with career stage of veterinarians.[8]

67 One of the challenges facing medical and veterinary educators is the lack of a
68 consensus on what constitutes professionalism.[2,9] Although it is widely acknowledged
69 that technical competence alone is insufficient, the other components of
70 "professionalism", lying in the non-cognitive domain,[2] are contested. Some of the
71 debate over the definition has been attributed to generational differences,[2] and,
72 within veterinary medicine, recent trends including the feminisation of the
73 profession,[8,10,11] an increase in specialised referral practice, and changes in regulations
74 relating to practice ownership.[8] Within medical education, recent work by Castellani
75 and Hafferty[12] suggests that the lack of agreement is due to the complexity of
76 professionalism, leading them to conclude that multiple perspectives exist dependent
77 on how an individual practices medicine and therefore prioritises key aspects of their
78 professional work. The same argument could also be made in a veterinary context
79 where a plethora of ways of practising has emerged, for example in terms of speciality
80 (varying from academic to specialist-clinician to general practitioner) and in terms of
81 the types and range of interpersonal interaction required (solitary laboratory work
82 through to consultations with clients and their pets).

83 Accepting that different members of the same profession may hold different views
84 depending on how they practice, and that this may lead to a lack of consensus over
85 which non-cognitive attributes should be included in the teaching of professionalism, it
86 is perhaps unsurprising to discover that formal teaching of professionalism rarely

87 produces the desired lasting effects.[13] A general assumption in education is that there
88 is a direct correlation between what is taught and what is learnt by the student.
89 However, this has been shown to not always hold true,[14] especially in cases where
90 what is to be learnt is not clearly defined.[15] If students are left unsure after their
91 formal education, they are more likely to develop attitudes about acceptable
92 professional practices from their real-world experiences; namely their interactions
93 within the clinical setting and the hidden curriculum.[16]

94 The hidden curriculum within this context sits alongside both the formal curriculum,
95 identified as planned and documented content, teaching and evaluation, and the
96 informal curriculum, identified as the unplanned, opportunistic teaching that takes
97 place as a result of encounters with clinicians leading to unplanned discussions
98 surrounding the particular cases seen in the clinics.[17] The hidden curriculum has been
99 defined by Hafferty[18] as, 'a set of influences that function at the level of organisational
100 structure and culture, buffeted by external forces and internal integration,' and has
101 been recognised as being communicated through the student-teacher relationship,
102 behaviour of staff and students, reward and punishment systems, institutional
103 structure, and government education policies.[19,20]

104 Despite a new wave of interest in the subject,[21,22] there is still very little published
105 regarding the hidden curriculum of veterinary education, particularly in comparison to
106 medical education, where much of the focus has been on the enculturation process of
107 young professionals,[23] together with their professionalism and professional identity
108 formation. In this regard, there has been considerable interest in the interactions
109 students have with role models during their clinical training.[23-30,17]

110 Much of the early work on the hidden curriculum of medical education, which has
111 many similarities with veterinary education in the English-speaking world, relied on
112 anecdotal evidence of its existence. More recently researchers have applied
113 qualitative research techniques to reflective narratives, such as student essays[31,32] and
114 professionalism journals,[30] as well as student and faculty interviews and focus
115 groups.[25,33] Despite the success of this research there is still limited knowledge of the
116 specific processes within medical education that directly influence the perceptions
117 fostered. As such, the aim of this study was to identify messages of the hidden
118 curriculum, relating to professionalism, present within the clinical year of a single
119 institution, and the processes through which these are communicated. This was
120 addressed through the following research questions:

121 1) What are the prevailing messages, relating to professionalism, communicated
122 through the hidden curriculum experienced by the students during their intra mural
123 (clinical) rotations (IMR)?

124 2) What processes within IMR are leading to the communication of these messages?

125 **Methods**

126 *Design*

3

127 Jackson[34] described the study of the hidden curriculum as the study of the students'
128 lived experience - in this context their experience of the final year clinical rotations of
129 the BVetMed programme - and such research has been recognised as requiring a
130 multifaceted approach.[35] Thus, for this exploratory study, two different qualitative
131 methods were chosen to complement each other; observations and interviews.
132 Whilst individual interviews have been established as an appropriate methodology for
133 gathering an in-depth understanding of the students' perceptions of the hidden
134 curriculum, the timing of these interviews, at the end of the clinical year, mean that
135 the students may have become enculturated, i.e. adjusted to the norms and values of
136 their environment, and therefore less able to identify institutional idiosyncrasies as
137 being just such. As an outsider to the veterinary culture, the primary researcher (CR),
138 a PhD student with an interest in the hidden curriculum, also took on the role of
139 observer, not only to triangulate findings with those from the interviews and therefore
140 improve the dependability of the findings,[36] but also to identify things that may
141 otherwise be missed by someone who is already part of the culture under observation.
142 The detailed design was approved by the RVC Ethics Committee.

143 *Context*

144 This study took place at the Royal Veterinary College (RVC), University of London, and
145 followed students on the five-year Bachelor of Veterinary Medicine (BVetMed)
146 program, graduating in 2012. The RVC is the largest of the UK providers of clinical
147 veterinary education, with an annual intake of over 240 students, and employs over 70
148 clinical educators across its three on-site hospitals.

149 The BVetMed course is undergraduate entry, with the majority of students entering
150 straight from high school. The first phase of the formal curriculum consists of courses
151 focused on the organ systems, with parallel, longitudinal professional studies
152 classroom elements. As in similar medical curricula, this includes elements such as the
153 social contract that frames the professions, codes of practice, professional ethical
154 reasoning, business ethics, communication and interpersonal skills such as leadership
155 and team-working, empathy, informed consent and shared decision-making. From the
156 third year onwards, organ systems modules are concerned more and more with
157 abnormalities and their treatment, and the students experience increasing clinical
158 exposure. Clinical education comprises 26 weeks of Extra Mural Studies (EMS) in non-
159 affiliated veterinary practices and 28 weeks of Intra Mural Rotations (IMR), based on 1-
160 2 week placements in each of the various clinical services offered by the on-site RVC
161 hospital services, from radiology to anaesthesia, dermatology to surgery.

162 The IMR are split into 22 weeks of core rotations, which every student must complete
163 and pass, and a further 6 weeks of elective rotations where students can pursue a
164 rotation of particular interest for them, for example, oncology. On all rotations,
165 students receive one of four grades: distinction, pass, borderline or fail, in each of
166 three categories: professionalism, technical knowledge and practical skills. For the
167 compulsory 22-week core, the students remain with the same group of 3-5 students.
168 Students choose their elective blocks which, together with clinical project choices,
169 dictate the order in which they will complete the rotations. Additionally, in this cohort,

170 students were also able to select two other students to be in their group, as well as
171 indicate any student they wished to avoid. This study focused on their experience
172 during these core intramural rotations.

173 *Sample*

174 Sampling for the study was purposive, in that participants were chosen that would
175 represent the diverse range of attitudes to professionalism previously identified in the
176 academic community under study[8]. The previous study, by Roder et al.,[8] identified four
177 clusters of views of professionalism within the institution. These were broadly
178 recognised as aligning with Castellani and Hafferty's[12] groups, comprising: those
179 displaying a naïve view (cluster 1); those experiencing dissonance (cluster 2); those
180 valuing professional dominance, with a somewhat nostalgic view (cluster 3); and those
181 valuing their autonomy (cluster 4).

182 *Observations*

183 Eleven student groups were contacted via email for permission to be observed across
184 five core IMR rotations, with each group being observed for 6-hours on each service.
185 With regard to the students' professional cluster membership, the groups identified
186 were either homogenous or heterogeneous in their composition, ensuring that
187 diversity in both student characteristics and group dynamics were represented. To
188 observe how students were affected by interactions with staff of similar and differing
189 professional attitudes to their own, we chose the five service rotations based on the
190 cluster membership of the teaching staff, identified from the previous study,[8] again
191 ensuring all the four identified views were represented. We chose to focus only on the
192 core rotations experienced by all students as part of their clinical learning, and only
193 chose those rotations in which students would have direct contact with both animals
194 and their owners as it was thought these would maximise opportunities for observing
195 acts of professionalism.

196 During the observations, the researcher (CR) took the role of an embedded but silent
197 observer, remaining detached from, yet sympathetic towards, the group in order to
198 access genuine behaviours,[37] a method recognised as naturalistic participant
199 observation. This was made easier as the researcher had had no prior contact with the
200 students in a teaching or assessment capacity, and with a background in education,
201 rather than veterinary science, was not in a position to provide students with help or
202 guidance with their learning. The selected students were observed continually over
203 the 6-hour period, with data collected during consultations, clinical procedures and
204 rounds, whilst on wards administering treatments and during husbandry duties, and
205 also during less formal moments such as tea breaks. The only time observations were
206 suspended was during simulations as this was deemed formal teaching and, therefore,
207 outside the boundary of this research. To remain minimally intrusive the researcher
208 took simple field notes, including noting contextual details,[35] before expanding these
209 into a personal reflection of the observed events immediately following the end of the
210 observation. Particular attention was paid to 'critical incidents' that may have taken
211 place.[37]

212   *Interviews*

213   Following the observations, at the end of the IMR rotations, the same researcher
214   conducted semi-structured interviews with some of the students from the groups that
215   had been observed. Three students representing each of the four identified views of
216   professionalism were initially recruited for interview, with further participants added
217   until data saturation was obtained.   A total of 23 interviews were conducted with each
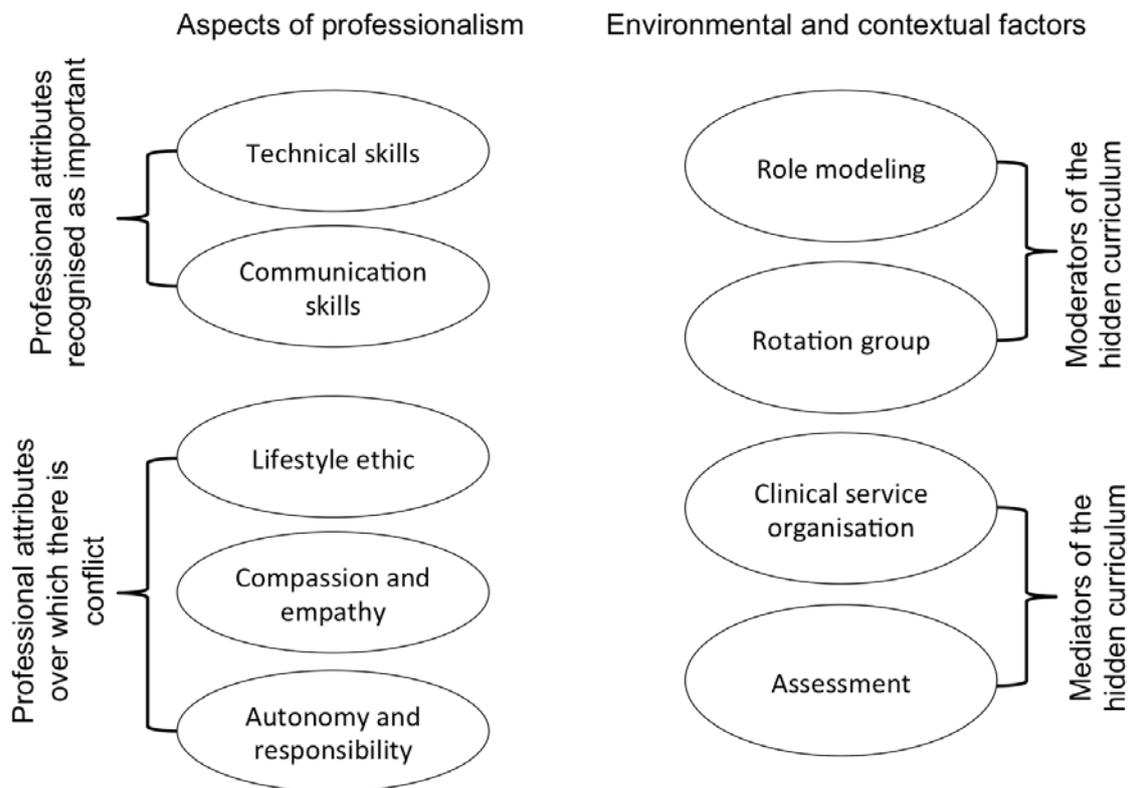218   lasting 40-60minutes.

219   The individual, semi-structured interviews were conducted face-to-face, so that the
220   researcher could note non-verbal cues and explore these further where appropriate.
221   With the interviewees' consent, the conversations were recorded and later transcribed
222   for analysis. The final anonymised transcripts were returned to the interviewees for
223   approval before analysis began.

224   *Data Analysis*

225   Data from the observations and interviews were combined and analysed
226   thematically, to capture and interpret meaning,[38] by the primary researcher (CR) who
227   has prior experience with qualitative data analysis. Initially an inductive approach was
228   applied whereby the observer reflections and interview transcripts were repeatedly
229   read and revisited in order to identify and refine codes. Once the codes were refined
230   they were then clustered into emerging themes before a final coding of all data.
231   Following this, a deductive approach was applied whereby the reflections and
232   transcripts were revisited in light of defined themes from the literature on hidden
233   curriculum and professionalism. This allowed the researcher to not only refine the
234   themes identified inductively, but also to question both these and the interpretation of
235   the hidden curriculum within the existing literature. Once the final themes had been
236   determined the reflections and transcripts were revisited one last time and illustrative
237   text identified. Credibility of the final themes was established through feedback from
238   dissemination of the initial findings both within the institution and to the broader
239   medical education community.

240   **Results**

241   Following thematic analysis of the data nine core themes were identified, initially split
242   under two headings: aspects of professionalism affected by the IMR experience, and
243   environmental and contextual factors contributing to changes in professional attitudes
244   (see Figure 1).

Aspects of professionalism   Environmental and contextual factors

Professional attributes recognised as important

- Technical skills
- Communication skills

Professional attributes over which there is conflict

- Lifestyle ethic
- Compassion and empathy
- Autonomy and responsibility

Role modeling

Rotation group

Moderators of the hidden curriculum

Clinical service organisation

Assessment

Mediators of the hidden curriculum

245

246 Five aspects of professionalism affected by the IMR experience were identified, and
247 can be further sub-divided into two categories: those aspects of professionalism most
248 prevalent during observations and in the students' discourse on the subject, *technical*
249 *skills* and *communication skills*, and those where the researcher recognised conflict or
250 tension both in how the students spoke about them and reacted to their experiences
251 whilst on rotation, *compassion and empathy, lifestyle ethic,* and *autonomy and*
252 *responsibility*. Under environmental and contextual factors, four themes emerged: *the*
253 *clinical service organisation, assessment, role models,* and *the students' rotation group.*
254 Initially classified into two sub-divisions, systems and people, these were then
255 renamed in light of how they were seen to operate as mediators and moderators of
256 the hidden curriculum; the mediators of the hidden curriculum, *clinical service*
257 *organisation* and *assessment,* bring about either a positive or negative change in
258 student views, and the moderators, *role models,* and *the students' rotation group,*
259 protect or expose the students to the influences of the mediators. The mediator and
260 moderator terminology has been adapted for this purpose from its use in both the
261 natural sciences and social psychology, whereby a mediator variable is one that
262 accounts for a relationship between two variables, whilst a moderator variable affects
263 the strength or direction of this relationship.[39]

264 *Aspects of professionalism most prevalent during the IMR experience*

265 The emphasis on improving technical competence as the primary function of the IMR
266 experience was clearly evident across all rotations observed. The students' attitudes
267 to improving their technical skills appeared to mirror this with opportunities received
268 with enthusiasm and at times generating competitiveness between learners. During
269 interviews, students were consistent in their perception of the importance of technical

270 competence to their level of professionalism, with some even believing the two were
271 synonymous.

272   "...you become more professional as your knowledge grows, as your confidence grows" (F1)

273 Second only to the students' view of the importance of technical competence to their
274 professionalism were their views regarding communications skills and, more
275 specifically, good clinician-owner communication.

276   "I've seen people who communicate really well with the clients and the way it helps
277   them, and then people who communicate really badly...even though what they're saying
278   may be right, they're still not listening because of the way they're saying it." (F12)

279 When reflecting on their previous communication skills training prior to starting their
280 rotations, students demonstrated a change in their attitudes following their IMR
281 experiences, acknowledging their initial overconfidence and dismissal of such skills as
282 not needing to be learnt. During the observations it was clear that in a substantial
283 number of cases students showed nervousness during client communications, either
284 visibly shaking or avoiding direct eye contact, and in the interviews their new lack of
285 confidence was confirmed. Despite this, most did not think such skills could be
286 explicitly taught, but instead were learnt through observing clinicians with good
287 communication skills in action.

288 *Sources of tension with professionalism*

289 Unlike the students' views towards technical competence and communication skills,
290 which were generally aligned, students demonstrated widely differing behaviours and
291 attitudes towards the three areas of the professional role identified as sources of
292 tension.

293 Some students considered demonstrating *compassion and empathy* as a fundamental
294 part of the professional role and expected staff to demonstrate compassion and
295 empathy towards animals and owners. These students were left disappointed when
296 observed practice fell short of their expectations, reinforcing their resolve to behave
297 differently when faced with similar situations.

298   "...we had to put a dog to sleep, and the lack of empathy that the vet was, he was so cold
299   about putting this dog to sleep in front of the owners who were crying...I'm going to vow
300   to try to never forget that and put myself in their shoes." (F15)

301 These students also expected the staff to extend this compassion and empathy
302 towards themselves, and there were multiple instances of students feeling aggrieved
303 when they felt were unduly punished for learning they had missed as a result of family
304 bereavements and other extenuating circumstances. Such incidences led the students
305 to believe that the staff prioritised technical competence over compassion. Further
306 examples of this prioritising of technical competence over compassion were also
307 observed, for example, one case on which all five students within a rotation group
308 were encouraged to palpate a distressed cat's fluid-filled stomach just minutes before
309 it was euthanised.

8

310   "I think, a lot of the time, they need to remember that they have to put the welfare of
311   the animals first. And I'm not saying that there's poor welfare standards, but, for
312   example, they might take longer on something because they're trying to teach so many
313   people." (F7)

314 In contrast to this, other students perceived this emotional detachment as a necessary
315 part of the professional role, allowing them to focus on the technical side of their role
316 without becoming clouded by emotions.

317 Similarly, students were divided on their thoughts regarding the *lifestyle ethic*
318 expected of someone entering the profession. Despite a near consensus of opinion
319 amongst the students on the exhausting nature of the rotations, and indeed students
320 were observed to be working consistently hard, they were split as to whether this was
321 an accurate portrayal of their future career, or merely a by-product of conducting a
322 majority of their rotations in a specialist referral hospital. Those that saw being a
323 veterinarian as a vocation expected nothing less than to give themselves whole-
324 heartedly to the profession, and were often students for whom being a veterinarian
325 was a lifelong ambition.

326   "I understood when I went into rotations that I'd basically, wasn't going to have a life. I
327   went into this whole university course knowing that I wanted to be a vet and knowing
328   that, as a vet, I'd have to do out of hours and unsociable hours and everything, which
329   doesn't bother me because it's what I want to do." (F4)

330 The desire for a more balanced lifestyle ethic was more evident in comments made by
331 mature students. Many of these students chose to sacrifice their originally preferred
332 career path for a more fulfilling personal life. For these students, clinicians in
333 predominantly referral hospitals were considered inappropriate role models as they
334 did not demonstrate this balance.

335   "It's hard here because most of the staff members you encounter are specialists and I
336   don't want to be a specialist. I don't want to work those sort of hours and I don't want to
337   basically live life just through work. It's hard to look at that and be like, 'I want to be like
338   you,' because actually I don't." (F13)

339 There was evidence that some, recognising the lifestyle ethic tension, were able to
340 take evasive action to protect themselves in both the short and medium term. Some
341 planned breaks in their rotation schedule to reconnect with friends and family, whilst
342 others had undertaken a radical rethink of the most appropriate career progression for
343 them.

344 The final aspect of the professional role over which there was perceived tension was
345 *autonomy and responsibility*. Whilst students welcomed the level of autonomy and
346 responsibility they were afforded during their time as a student, they were conscious
347 of the "unrealistic" setting in which they were learning; that of a referral hospital with
348 access to the latest tools in diagnostic testing and in which a majority of patients were
349 funded by insurance.

350 "...you never think about [how much things cost whilst you're on rotations] you do what's
351 best for the animal. The animal's health is your goal. It's not like when you have a boss
352 breathing down your neck telling you how much everything costs." (F14)

353 Indeed very few of the cases observed were constrained by the finances of the
354 individuals concerned, and only one clinician on one service was observed to
355 consistently explore alternative treatment options in the light of possible constraining
356 factors.

357 *Mediators of the hidden curriculum*

358 Both the assessment processes employed for the rotations and the clinical service
359 organisation were influential over students views of the professional role. On each
360 service, students were graded and given feedback in three areas of their practice:
361 technical knowledge, practical skills, and professionalism. Faculty assessment of both
362 practical skills and technical knowledge was transparent during both rounds and
363 interactions with patients, with some departments even recording instances of
364 successful procedures, such as catheter insertion, on tick charts on the walls.
365 Instances of assessment of the students' professionalism were far more difficult to
366 observe, and during interviews students also highlighted what they perceived as a lack
367 of an evidence base for their assessment in this area, particularly in comparison to the
368 other two areas. In part, this may be attributed to the clinical service organisation,
369 where students initially undertake consultations with owners unaccompanied then
370 report back to the leading clinician, meaning they were rarely accompanied by a
371 member of staff during their interactions with clients, something they believed was a
372 key indicator of their professionalism.

373 "I haven't had a single clinician watch any of my consults. Or, like, they always say, 'client
374 communication is good,' but I don't know how they know that because they haven't
375 observed it." (F14)

376 This, coupled with a view that the terminology used in the grade descriptors for
377 professionalism was too subjective, allowed them to dismiss negative feedback or poor
378 grades as a failure on the part of the assessing member of staff, not a reflection on
379 their own performance. These problems were exacerbated in instances when all
380 rotation group members received the same feedback, but diminished when staff took
381 the time to also provide verbal feedback.

382 The clinical service organisation also proved to promote the importance of technical
383 competence above, and often at the expense of, other aspects of the professional role.
384 A vast proportion of the students' time is spent in referral services, with clinicians who
385 have been attracted to work in such a technical and highly specialised service. The
386 cases seen, and the tools at their disposal, are more advanced than those they are
387 likely to encounter in first opinion, primary care practice where most will begin their
388 career, and they are also rarely confined by budgets not covered by insurance. Whilst
389 for some this gave them confidence, others raised concerns over the lack of
390 transferrable skills they were gaining and their ability to tackle cases under real-world
391 constraints. One, almost unanimous, effect of being in such a specialised
392 environment, was the impact it had on the students' views of what it meant to be a

successful veterinarian, with the implication being that, as a general practitioner, you could only be mediocre at best:

> "...going through rotation where it is so specialised, it makes you realise you need to be specialised. Not necessarily in a certain aspect of medicine, but at least in a species...I'd rather be good at one thing than mediocre at all of it." (F14)

Not all the implications of working in a referral setting were negative however, and being in an environment where everyone, from senior clinicians to student nurses, was learning gave students confidence to ask for help when needed and ideas as to where to source information.

Moderators of the hidden curriculum

During the interviews it emerged that both the strength and direction of the students' attitude changes during their IMR experience were effected by their relationships with individual clinicians as role models and their rotation group. For this reason, these have been termed as moderators. They both also had an effect on the students' enjoyment of their rotations.

Choosing role models was an active process, with students looking for individuals exhibiting characteristics they already deemed important; for example, students for whom compassion and empathy were a key part of the clinical role looked for individuals who were able to demonstrate this. Other key characteristics consistently mentioned included enthusiasm, calmness, and approachability, particularly with respect to the students' learning. Perhaps unsurprisingly, in the light of the observations made regarding the emphasis on technical competence, if they were unable to pick a role model based on other non-cognitive characteristics, they often opted for those at the forefront of their respective field. Those students for whom lifestyle balance was a priority found identifying a role model within the institution difficult, instead looking outside the university to veterinarians they had encountered during their extra mural studies.

Identification of suitable role models allowed students to feel safe in their learning environment, as did a supportive rotation group. Even in groups seen not to socialise during their breaks, peer support in the learning process was still frequently observed. However, for most groups, the provision went beyond this, affording individuals emotional support as well. Both the support received from their rotation group, and their identification of role models exhibiting the characteristics they believed important, allowed students to hold on to, or even build on, their pre-existing attitudes regarding professionalism in the light of challenges faced during their IMR experiences.

> "...one clinician failed my friend and he didn't deserve to fail. He's not the sort of failure student. And you think, 'oh, you failed that? Why?' And then you look at the clinician and you know why." (F1)

Discussion

Principal findings and their meaning

This study has established that those aspects of professionalism most prominent in students' minds following their interaction with the hidden curriculum during their clinical rotations were their technical competence and communication skills, which fits with the ranking of these aspects of professionalism in an earlier study.[8] Their views on compassion and empathy, autonomy and responsibility, and lifestyle ethic, and their importance to the professional role, were also affected as a result of their interactions with staff, students and animal owners. The assessment processes employed during rotations and the clinical service organisation communicated the messages of the hidden curriculum, acting as mediators and leading to observed, and reported, changes in students' views. The extent to which students were affected by these mediators appeared dependent on their ability to identify appropriate role models and their relationship with their rotation group, both of which emerged as moderators of the hidden curriculum.

As well as identifying the effects of the hidden curriculum of the clinical rotations on final year students at the RVC, this study has also identified different components of the hidden curriculum and their modes of action: the mediators and moderators. Categorisation as either a mediator or moderator appears dependent not only upon whether the influence is a system (mediator) or related to individuals (moderator), but also by the level of consciousness the student has of their possible effect. Whilst students expect the clinicians to be potential role models, and are able to analyse their behaviour objectively, they have demonstrated little awareness of the effect of the clinical service organisation and its subtle yet continuous messages. In relation to the work of Portelli[40] on the "hiddenness" of the hidden curriculum, this would suggest that the hidden curriculum can be, but does not have to be, hidden from the student, but whether it is recognised by them or not appears to affect whether it is likely to be characterised as a mediator (unrecognised) or moderator (recognised).

Of concern to students' developing views of professionalism is the subtle means by which systems such as the clinical service organisation and assessment processes contributed to the erosion of certain values in the group of students. In the past, the erosion of these values, and a general hardening of students, has been attributed to insufficient role modelling.[7] However, the evidence presented here suggests that role models are secondary to influences of the identified systems-related mediators, namely because of the selective process through which the students are choosing their role models. The clinical service organisation and assessment processes, however, consistently promote and reward technical skills and knowledge, and students who wish to express compassion potentially hamper their own learning. Similar dilemmas have been reported in medical education,[41] with concerns raised over the impact this can have on the students' ethical growth if it is not appropriately addressed.

Although the students often used different terms from those identified by Castellani and Hafferty,[12] which were used in the survey to establish their view of

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474 professionalism, a majority of what was discussed could still be classified under the
475 headings of technical competence and interpersonal competence. This is perhaps
476 unsurprising considering, when surveyed, both students and staff consistently ranked
477 these in the top two positions in terms of importance, indicating that they are at the
478 forefront of everyone's minds.[8] The students' increased focus on the importance of
479 interpersonal competence post-rotations, and in particular the importance placed on
480 client communication, mirrors the findings of Rhind et al.[42] in their study on attributes
481 considered important by recent veterinary graduates. What may be of concern here,
482 however, is the lack of other aspects of professionalism referenced by the students
483 during the interviews, indicating a somewhat narrow view of the subject. This was
484 particularly evident in those few for whom technical competence and professionalism
485 were synonymous. Certain aspects of the professional role, including those pertaining
486 to personal morality and the wider societal implications of being a member of a
487 profession, such as the social contract and social justice, were barely acknowledged.

488 *Implications for practice*

489 It is known that assessment drives learning,[43] and that the hidden curriculum
490 contributes much of what is learned.[34] Yet, despite this, the contribution of
491 assessment to the hidden curriculum has been under-examined since the early work of
492 Snyder,[44] and has been relatively unexplored in the clinical education literature. The
493 observations made in this study, coupled with the detail provided by the students
494 during interview, indicated two primary issues in relation to assessment and the
495 hidden curriculum: firstly, the assessment processes determined what they considered
496 important in rotations, and secondly, with regard to the professional role, students
497 were left questioning staff competence in assessing the non-cognitive aspects of their
498 professionalism.

499 Whilst practical skills and technical knowledge are assessed independently of one
500 another, all other non-technical skills are branded together and assessed under the
501 heading "professionalism", a term already noted here as being widely undefined. In
502 order to be considered effective, some understanding of what is being assessed under
503 this heading is a necessity for both staff and students,[45,46] particularly when using
504 feedback to aid progression.[47] Alongside this, the opportunity for what is being
505 assessed within the clinical setting to be observed by staff adds validity to the
506 assessment in the eyes of the student. Direct observation of students in the clinical
507 setting has been acknowledged as variable at best,[48] yet in order to accurately assess a
508 student's competency in any task, the teacher needs to gather direct evidence of their
509 current attainment.[45,49] Lack of direct observation limits the opportunities for
510 meaningful feedback[50] and, for the student to value the assessment and any feedback
511 given, the process needs to be linked to specific events directly observed by the
512 assessor.[46] In this regard, there was a stark contrast in this study between the way
513 technical skills were well understood by both students and staff, and directly observed,
514 and the way professional skills were poorly defined and understood, and only
515 indirectly evidenced.

516 In addition to the assessment procedures, consideration should also be given to how
517 clinical service organisations provide opportunities for the explicit teaching and role
518 modelling of non-technical aspects of the professional role. Although it may be
519 assumed that being immersed in the hospital environment, observing day-to-day
520 interactions, students would naturally develop these skills, research into
521 apprenticeships reveals that, unless explicitly taught, they are not just "picked up".[51]
522 Of concern for veterinary education in this regard is the finding by Lane and Bogue[52]
523 that, despite recognising the importance of non-technical skills to the professional
524 role, faculty showed very little recognition of their responsibility to teach them.
525 Consideration must also be given as to how specialist service exposure is balanced
526 with primary care experience and explicit recognition of primary care expertise[53]
527 particularly in light of the Vet Futures report.[54] The hidden curriculum of a specialist
528 block structure in rotations had a powerful influence on the students' views of what
529 constituted "a good vet".

530 As a case study of the hidden curriculum of a single institution, this project benefitted
531 from an in-depth analysis of the complex interactions that take place in a real world
532 setting. Although this may limit the transferability of the findings, it is hoped that by
533 providing adequate details of the context in which this research took place, others may
534 draw parallels with observations made at their own institutions.[55] Both the case study
535 methodology, and the use of researcher-led observations and interviews for data
536 collection, also leave this study open to criticism regarding the influence the
537 researcher's personal subjective feelings may have had on the findings.[37,56,57] However,
538 by demonstrating that the research has been conducted rigorously, with authenticity
539 (evidence the researcher was there and their description of events is genuine),
540 plausibility (there is a link between the observations made and the readers own
541 world), and criticality (making readers re-examine their underlying assumptions on the
542 subject),[58] it is hoped that this has been minimised.

Acknowledgements

Figure captions

548 Figure 1: Categories of codes found during analysis of the qualitative data.

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