1 **How does student educational background affect transition into the first year of**

2 **veterinary school? Academic performance and support needs in university**

3 **education.**

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5 Short title: Veterinary student support

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18   **Abstract:**

19   The first year at university is critical in shaping persistence decisions and plays a

20   formative role in influencing student attitudes and approaches to learning. Educational

21   experiences, especially of secondary education and higher education (previous university

22   education), will shape the students' ability to adapt to the university environment and the

23   study approaches required to perform well in highly demanding professional courses such

24   as medicine and veterinary medicine. The aim of this research was to explore the support

25   mechanisms, academic achievements and perception of students with different

26   educational backgrounds in their first year at veterinary school. Using questionnaire data

27   and examination grades throughout the year, the effects upon student perceptions, needs

28   and educational attainment in first year students with and without prior university

29   experience were analysed to enable an in depth understanding of their differing needs.

30   Our findings show that school leavers (successfully completed secondary education, but

31   no prior university experience) were outperformed in early exams by those who had

32   previously graduated from university (even from unrelated degrees). Large variations in

33   student perceptions and support needs were discovered between the two groups: graduate

34   students perceived the difficulty and workload as less challenging and valued financial and

35   IT support higher. Each student is an individual, but ensuring that universities understand

36   their students and provide both academic and non-academic support is essential. This

37   research explores the needs of veterinary students and offers insights into continued

38   provision and improvements that can be made to help students achieve their potential and

39   allow informed 'Best Practice'.

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41   **Keywords:**

Introduction:

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45   The first year at university has been continuously identified as the most critical in shaping

46   persistence decisions and plays a formative role in influencing student attitudes and

47   approaches to learning [1-5]. Similar to medical students [6], veterinary students have added

48   pressures compared to students on many other courses. Contributing to this are the course

49   content and high work load; the wide range of skills required; the expectation to behave

50   like a professional and to be judged accordingly; having to communicate effectively with

51   a wide range of people and having to deal with emotions in difficult situations including

52   life/death decisions. A five year degree course such as veterinary medicine, with extensive

53   entry criteria and work experience requirements leads to a student group that is generally

54   highly able, motivated and committed but also highly competitive and used to academic

55   success. Degree completion rates in UK universities are generally high in medicine and

56   veterinary medicine with attrition rates only around 5%, in contrast to the overall

57   university attrition rate of around 17%. The reasons for leaving are usually accumulative

58   and include [7]: inappropriate information to make course choice, poor transition to higher

59   education, unclear academic expectations and lack of guidance, insufficient access to

60   support, alienation and isolation, too many other commitments and financial pressure.

61   There are mixed views in the literature as to whether more mature students gain better

62   or worse grades than younger students. 'Mature' is too broad an age spectrum, since two

63   peak ages were observed in academic achievement; 18-19 years old and 26-30 years old

64   [8]. This was confirmed in British veterinary science degrees in 1995 when statistics showed

65   that 100% of under 21 year olds received a 'good' degree (classification of 1st or 2:1), but

66   that this figure dropped to 76.6% in the 21-25 age group, and increased again to 100%

67   in the 26-30 year old group [9]. Figures were not available for veterinary medicine, however

68   medicine and dentistry showed that numbers attaining a 'good' degree decreased with age

69   89.5% in the under 21s, 88.4% in the 21-25 group, 63.6% in the 26-30 year olds and

70   66.7% in those aged 31-40 [9]. In contrast, other general studies suggested an increase in

71   attainment until 36-40 years of age, with a decline thereafter [10]. In the medical field very

few studies have compared the academic performance of graduate students and school leavers (defined as those who had successfully completed secondary and further education, but no prior university experience) on the same curriculum, most studies focus on the accelerated graduate entry programs (GEP) in comparison to the traditional medical degree course, where course type and admission selection rather than graduate student attributes may explain differences [11-13].

It is often perceived by staff that graduate students may need less assistance or guidance as they have already experienced the transition to university [8,9,10]. However, the workload and structure of medical or veterinary degree courses might be a very different experience and still very challenging, especially if they require part time work to finance the course. Therefore it is important to understand the perceptions and needs of students with degrees and also to understand whether they achieve the same grades as school/college leavers. The aim of this study is to investigate the impact of prior education on the academic performance, perception of first year of the veterinary medicine and science course and support requirements of first year students at veterinary school.

Materials and Methods

Student cohort: The student cohort on the five year BVMBVS with integrated BVMedSci at The University of Nottingham consisted of 109 students. In order to gain entrance into the veterinary school, all students applied through the British UCAS system and completed a questionnaire specific to this veterinary school. All students were either interviewed in a 3-part interview process (interview with academic & clinical staff; practical aptitude test and team working task) or a telephone interview was performed (for some international students) with a basic scientific and clinical academic staff member.

Student performance: In first year of the course, students performed summative assessments in all modules within a systems based teaching curriculum. Teaching consisted of four block modules (Musculoskeletal (MSK), Lymphoreticular Cell Biology (LCB), Cardiorespiratory (CRS), Neuroscience (NEU)) and two long modules (Animal Health and Welfare (AHW) and Personal and Professional skills (PPS)); except for PPS, all modules were assessed online by multiple and extended choice questions (66%), short answer examinations termed spot tests (33%) and assessment of practical skills termed objective structured practical examinations (OSPE, pass/fail). PPS was assessed by coursework (100%), portfolio (pass/fail) and a skills diary (pass/fail). There were two assessment points, the first two modules, MSK and LCB, were assessed in January in the first week of the academic term and the other modules as well as all OSPEs were assessed at the end of the academic year (June). Prior to the summative assessments, students had the opportunity to participate in formative assessments covering all assessment methodologies used.

Examination results were analysed and the performance of 'graduate' vs 'school leaver' students were compared: (1) overall year 1, (2) each module, (3) for all modules (except PPS) computer based assessment and spot test, (4) number of re-sits and (5) number of students that failed to progress after re-sit. Admission into the university was via one of three routes –preliminary year, straight into first year or a 'Gateway' year. The University

118 'preliminary year' in veterinary studies required AAB grades from any 'A' level subjects but

119 is specifically for students who did not take an 'A' level in either biology or chemistry.

120 Students accepted into the first year had achieved 'A' level grades including A for biology,

121 A for chemistry and at least grade B in any other subject excluding general studies. The

122 'Gateway' further education college course required grades B,B & C at 'A' level and

123 students were taught in a different location to the veterinary school.. The 'preliminary

124 year' students were taught within the veterinary school higher education environment,

125 and were therefore grouped with the graduate students as they had encountered a

126 university lifestyle and education system prior to starting the veterinary degree. School

127 leavers were defined as those who had successfully completed secondary and further

128 education, but had no prior university experience. 'A' level grades achievable are A*-E and

129 unclassified (fail). A unified marking scheme is used to compensate for examination paper

130 difficulty. The maximum points available are 600 and A* represents 480 points or above

131 plus over 90% of unified marks in a set number of examination papers, A 480 points or

132 above, B 420-479 points, C 360-419 points.

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134 *Questionnaire:* A voluntary questionnaire was given to all students in the final term of the

135 first year as part of a Personal and Professional Skills (PPS) teaching session. Research

136 was carried out following approval of the study and the questionnaire from the 'Human

137 Subjects Institutional Review Board'. All questions and the student responses are

138 summarized in Tables 2 and 3. Students were asked 1) to evaluate a number of statements

139 with regards to their first year experience (adapted from Powers et al. [14] on a linear visual

140 analogue scale (0-100 mm; thus ensuring that a continuum is provided rather than

141 discrete jumps as categorization would provide) from 'strongly agree' to 'strongly

142 disagree', the neutral midpoint was marked; 2) to evaluate a range of support services

143 (peer, veterinary school and university support) on a linear visual analogue scale (0-100

144 mm) from 'very important' to 'not important at all', the neutral midpoint was marked; 3)

145 a number of open questions including 'Please add any further comments you have about

146   how well your prior experience of education (school in general/subjects studied/previous

147   degrees etc.) prepared you for this year', 'What could be improved in terms of the support

148   given to students?' and 'Please give any further comments regarding your experiences this

149   year and the support systems in place'. The linear visual analogue scale responses were

150   measured manually by ruler. The support systems that students evaluated are shown in

151   Table 3 and consisted of those offered by the veterinary school, those offered by peer

152   interactions and those offered as general services by the university.

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154   *Statistical analysis:* To measure the internal consistency, and hence the reliability of the

155   questionnaire, Cronbach's Alpha coefficient was determined. Questionnaire responses and

156   assessment results of graduates and non-graduates were compared using the non-

157   parametric statistical test Mann-Whitney U, two tailed with 95% confidence interval. P-

158   values of less than 0.05 were deemed significant.

159 **Results**

160 <u>*Impact of admission process on student cohort*</u>

161 Of the 1366 applicants to the five year BVMBVS with integrated BVMedSci, 11% (155)

162 were classified as graduates and 89% (1211) as school leavers. 5% (14) of the 304

163 applicants invited to interview, were graduate students. Of the 133 offers made, 8% (10)

164 were to graduate students. The final BVMBVS cohort contained 23% (26) graduate

165 students from 111 students. In addition, to the 10 'graduate' students selected at

166 interview, 16 students were admitted from the preliminary course, located at University

167 of Nottingham School of Veterinary Medicine and Science, and were grouped together with

168 the graduate students. Five students were admitted from the Gateway course and were

169 considered as school/college leaver status. Two non-graduates deferred entry. This data

170 is also shown in Table 1.

171 <u>*Perception of 1st year experience according to previous education*</u>

172 The return rate for the questionnaires was 94% (103 out of 109 students), however not

173 all students answered all questions. The estimated reliability (coefficient alpha) of a

174 composite score based on all 16 items was 0.62, which is higher than the acceptable values

175 of 0.5 [14,15]. The cohort responses regarding their first year experience are summarised in

176 Table 2. The whole student cohort strongly agreed that they were 'learning a lot' and 'were

177 confident to participate in all tasks in practical teaching' and agreed that they had 'felt

178 overwhelmed at the workload' but 'teaching had been clear and understandable' and that

179 they were 'satisfied with progress in learning the knowledge and skills required for a

180 veterinary medicine degree'.

181 School leavers were more likely to feel that the course was too hard for their ability

182 (median=72.5 for graduates vs 56 for school leavers, p=0.01; medians calculated from a

183 visual analogue scale 0-100 mm from '0=strongly agree' to '100=strongly disagree', all

184 ranges are shown in corresponding Tables 2 and 3) and less likely to agree that they had

185 relatively little difficulty understanding course material (median=39.5 for school leavers

186 vs 50 for graduates, p=0.0006). Despite the increased level of school leavers finding the

187 work more difficult, it was also clear that school leavers felt that their school experience

188 had prepared them well for studying at university in comparison to graduates (median=39

189 for school leavers vs 21 for graduates, p=0.01). There were no comments pertaining to

190 how the students felt that school had prepared them, whether it was academic, personal,

191 organisational or life skills that they were thinking about (Table 2).

192 Free text answers illustrated that some students strongly felt that school had not prepared

193 them for university education. Quotes included: 'the sixth form way of teaching is different

194 to university and I don't feel I was initially prepared by my sixth form', 'school only

195 scratched the surface of most topics so I found a huge jump from what I knew to what I

196 was expected to know', 'none of my previous experience prepared me to manage my time

197 effectively in order to cope with the large workload', and 'at school we were generally

198 spoon fed in the science subjects, which in some cases has been a disadvantage when

199 suddenly being very independent at university'. One person stated that 'subjects studied

200 (biology, maths, chemistry) has given me a good ground knowledge which new material

201 has built on. The learning technique [at university] is a lot more independent whereas in

202 school was more 'spoon-fed' and about achieving grades rather than understanding the

203 content'.

204 Students that reached the course through the veterinary school based preliminary or

205 Gateway years generally felt better prepared for the veterinary course, which was also

206 reflected in their free text comments: '[I] think Gateway course had good content however

207 there weren't many practicals with animals & most staff were not very supportive', 'The

208 Gateway course helped me significantly & improved my confidence' and 'There are many

209 topics I had not covered in school before I came here. Some topics I have covered in the

210 Gateway course which has helped this year. None of my previous experience prepared me

211 to manage my time effectively in order to cope with the large workload. I have found that

212 a lot of lecturers presume we have already learned many topics and so the basics in that

213 area are not explained – just the more complicated in depth areas.'

215 *Support mechanisms based on previous education*

216 The students were asked to rate their support systems ranging from peer support and the

217 tutor system to veterinary school specific support and the university support systems. All

218 data (median and ranges) are summarized in Table 3. All groups of students (school leaver

219 or graduate) placed the 'extramural placements office' at the top of their support systems,

220 with personal tutor and the School reception always present in the 'top five' rated support

221 systems. The student ratings of support were generally very similar between graduates

222 and school leavers. A few notable exceptions were observed: the school leavers rated the

223 'student-IT-helpdesk' service more highly than graduates (median=32 for school leavers

224 and 16.5 for graduates, $p=0.04$), while the university financial support service was more

225 highly rated by graduates (median=29 for graduates in comparison to 50 for school

226 leavers, $p=0.04$). The ranked data (Table 4) showed that the school leavers found the

227 tutor family (two academics assigned to around 6 students per cohort plus one senior tutor

228 per cohort), welfare drop-in session and the peer support of other students more useful

229 than the graduate students did.

230

231 *Academic achievement based on previous education*

232 Of the 109 students, 107 participated in the assessments at the first assessment point

233 (MSK & LCB), two students had extenuating circumstances and their assessment results

234 were obtained from their first sit in the re-sit period (August). All students participated in

235 the second assessment point (June).

236 All examination grades (online and spot test; Fig 1) from the six modules of the first year

237 of the veterinary medicine degree course were evaluated. The graduate students gained

238 significantly higher grades than the school leavers in the assessments at the first

239 examination time point: MSK spot test (median=61% graduate and 51% for school leaver,

240 $p=0.02$), in the LCB exams (online: median=70% graduate, 61% for school leaver,

241   p=0.04, spot: median=66% for graduates vs 61% for school leavers, p=0.02), leading to

242   significantly better overall marks for these two modules (MSK: median=66% for graduates

243   vs 50% for school leaver, p=0.04; LCB: median=69% for graduates vs 62% for school

244   leaver, p=0.01), While there were no significant differences in assessment performance

245   at the second assessment point, the earlier enhanced performance was still significantly

246   reflected in the overall year 1 grade (median=68% for graduates and 61% for school

247   leavers, p=0.03; Table 5a and Fig 1). When international students (three graduates & 19

248   school leavers) were excluded from this analysis, graduate students still performed better

249   than school leavers but the differences were no longer significant (Table 5b). Comparing

250   the end of year performance per grade bracket, most graduate students were in the 70%+

251   bracket followed by the 60-69% bracket, compared with the school leaves where most

252   students fell within the 60-69% bracket followed by the 50-59 bracket (Fig 2).

253

254   **Discussion**

255   _First year learning experience and performance_

256   Our study has clearly highlighted that in the first year of a veterinary medicine degree,

257   initially graduate students perform better with significantly higher marks in the first

258   assessment point leading to a year 1 overall mark 10% (on average) higher than that of

259   school leavers. This supports the view that graduate students are already familiar with the

260   university environment and the study approaches required to perform well. The only study

261   comparing academic performance of gradate entry and school leaver entry medical

262   students completing the same pre-clinical curriculum and assessments, showed that

263   graduate entry students performed significantly but only marginally better than school

264   leavers over all four bioscience knowledge assessments [17]. However, in that previous

265   study, students were only included if they passed the subject on their first attempt with

266   the reasoning that a fail may not reflect their academic ability but may be due to health

267   or personal reasons [17]. In our study all assessment performances were included, except

268   for students with valid medical or personal extenuated circumstances that had their exam

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269 performance annulled if failed. While a fail in first year assessments may not be a true

270 reflection of the students' knowledge, if no extenuated circumstances are present, it very

271 likely reflects their difficulty in transition to the veterinary course, be it the difference in

272 teaching delivery, independent learning, work load or the university environment as a

273 whole. Our data clearly show that graduate students perform significantly better in the

274 early assessment point but by the second assessment point this difference in assessment

275 results is diminished. Some of this academic advantage may be due to prior obtained

276 scientific knowledge but since this advantage is most likely in the early part of first year it

277 suggests that prior experience of tertiary education is an important factor. This is similar

278 to the outcomes of a study comparing knowledge assessment outcomes between graduate

279 students on a four year UK Graduate Entry Programme (GEP) for medicine with those of

280 a conventional five year program, showing that the GEP students performed significantly

281 better than both, school leavers and graduate students, on the five year course [12]. This

282 better performance may be due to differences in selection policy, structure of teaching,

283 academic support, or the course working environment [12], however, no data were presented

284 or discussed comparing the performance of graduate students and school leavers within

285 the 5 year course. Further data analysis showed that this difference is mainly due to

286 international students in the school leaver group, confirming again that transition to

287 university is challenging, especially if that also means a different cultural or language

288 environment.

289 In contrast to the marked difference in student performance, the perception of their first

290 year experience is very similar for both groups, reflecting that the veterinary medicine

291 degree course has a higher workload and faster pace than some other degree courses.

292 The main differences include that graduate students are more confident in their ability to

293 cope with the course and to understand the course materials.

294

295 *Student support*

Student support is very important since the pressures listed above and the associated stress can lead to mental health problems. Up to a third of students surveyed in their first year at a veterinary school reported clinical levels of depression and elevated anxiety levels [18, 19]. The main causes reported for that were homesickness, academic concerns, difficulty fitting in with peers and poorer perceived physical health. The University of Nottingham and the School of Veterinary Medicine and Science offer a range of support systems to avoid the escalation of stress and anxiety levels. However the rating of those support systems by the students is variable, probably reflecting the perceived personal need for the support offered. This study showed that school leavers were more likely than graduates to feel that their school experience had prepared them well for university. This would certainly be worth further investigation in order to further comprehend which skills are perceived as being useful by both sets of students, in order to inform higher education institutions. It was noted in our results that 'graduates' are less likely to rate tutor family or their peers highly within their support network. It is possible that these students rely on mechanisms such as family/friends in their personal life, more than school leavers, but it is also important to highlight that 'friendships and social networks' have been found to be important factors relating to student retention [20]. Would 'mature students' benefit more from being in mixed age tutor groups or 'mature student only' tutor groups? Support tailored towards mature students has been suggested. In 2011, the British government highlighted the need to both attract and support mature students [21]. It has also been observed that financial problems, confidence in ability and perceived lack of support from teaching staff, caused problems for 'non-traditional learners', including mature students [22]. Specialised support programmes for mature students, staff awareness training, a mature student survival guide and orientations aimed at mature students have also been suggested in order to assist in forming peer networks and support systems [23]. On the other hand graduate students have the additional costs of the second degree. Compared to school leavers, university financial support services are seen by graduate students as a more important university support system even in year 1. Financial pressures will potentially increase over the five year course, especially due to EMS and clinical EMS

325 leading to less opportunities to work in teaching free times and also increased costs in

326 addition to the very intensive fifth year rotations. In addition, some of these graduate

327 students are more likely to have differing family and financial responsibilities (for example

328 partners, children, act as carers for parents, mortgages, differing loan and/or bursary

329 opportunities), and are more likely to have been in the workplace and have taken a large

330 drop in wages, in comparison to school/college leavers. The long term impact on the

331 increase in fees at UK universities especially in the long and intense courses such as

332 medicine and veterinary medicine still needs to be established. While medicine and

333 veterinary medicine are professional degrees with currently good employment

334 opportunities, it needs to be shown in the future if studying those courses as a second

335 degree is financially viable.

336 Higher Education Institutions are experiencing increased governmental, institutional and

337 market pressure to achieve high standards in education, whilst also providing higher levels

338 of support, especially as education increases in price [6]. This has led to the view that

339 students have become 'customers' rather than beneficiaries of tertiary education [6]. Hence

340 universities have to find a balance between listening to their students and acting upon

341 student feedback, thus ensuring that they attract, and maintain the best students but also,

342 maintain educational standards so that degrees are not simply obtained because a student

343 pays enough money. It is known that the financial return of a degree depends upon the

344 degree subject, institution attended, and degree class obtained, it is therefore essential

345 that all students are provided with an equal chance through the university support systems

346 to excel at their studies and enhance their lifelong chances of financial reimbursement for

347 their studies. This is especially important for graduate students that invest into a very long

348 secondary degree program with little opportunity to work in lecture free time due to work

349 placements.

350 In a Finish study on first year students' perception and performance in an macroscopic

351 anatomy module (one of the first modules) prior university experience did not

352 significantly improve performance but reduced stress levels [24]. While a number of first

353 year students in countries such as the US already have a degree and hence experience

354 of the university learning environment, the intensity of the course program, the time

355 commitment, large amount of information to learn and memorize can still be very

356 challenging [25,26]. The impact of this high workload may also reflect surface approaches to

357 learning, which is negatively associated with grades achieved in assessments [27].

358 A descriptive study like this has some limitations that need to be acknowledged. This

359 study was performed in a UK university with the majority of students moving straight

360 form secondary education to university, which is common in European countries but

361 different to countries such as the US where students that enter veterinary medicine have

362 already obtained an undergraduate degree. However, the recommendations for graduate

363 students will still be relevant. While a high return rate for the questionnaire, only very

364 few students answered the free text questions and hence no qualitative analysis was

365 possible. Focus groups and face-to-face interviews might have yielded more in depth

366 information. The sample size was relatively small, so caution should be used when

367 generalizing these data.

368 *Recommendations/educational implications*

369 - Information about support systems needs to proactively be highlighted at several

370   time points throughout first year, especially near revision and exam result release

371   times, to ensure that all students are aware of the support available.

372 - Ensure an atmosphere whereby to identify problem areas and to seek

373   help/support is seen as a strength and a sign of good professionalism.

374 - University support needs to be aware of specific needs/stress points of veterinary

375   students, especially around time management and work load in comparison to

376   some other degree courses in order to provide suitable coping strategies as well

377   as academic and financial advice.

378 - Tutors and welfare staff need to be aware that graduate students, although

379   familiar with the university environment may still find the workload and time

380   intensive teaching of the veterinary curriculum overwhelming. In addition,

381   financial support options and coping strategies should be pro-actively discussed

382   with graduate students

383 *Summary and conclusions*

384 It has previously been suggested that 'treating people fairly does not mean treating people

385 in the same way - we need to recognise difference and respond appropriately' [28] and it is

386 the conclusion of this study that graduate students and school leavers have very differing

387 educational and support needs, and that education providers need to be aware of these

388 differences in order to respond and provide accordingly.

389 Understanding the requirements and abilities of students who have prior university

390 experience is very important. As shown in our study, initial transition into the highly

391 demanding veterinary degree course is towards the end of first year perceived by graduate

392 students as easier with regards to course material and prior knowledge compared to school

393 leavers. This is also reflected in assessment performance, with significantly better results

394 in the early assessments leading to significantly better grades at the end of year 1

395 compared to school leavers, even though the performance of both groups of students was

396 the similar in the end of year assessments.

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428 **Table 1. Background education status of students applying to veterinary**

429 **medicine through to the final cohort**

	School Leaver	Graduate
Applicants to Veterinary Medicine n=1366	1211 (89%)	155 (11%)
Offers made by the university to study veterinary medicine n=133	123 (92%)	10 (8%)
Admitted via Gateway course and preliminary course n=21	5 (24%)	16 (76%)
Number of offers accepted n=111*	85 (77%)	26 (23%)
Final cohort n=109	83 (76%)	26 (24%)

430 *Two school leavers deferred entry for one year

431

432 **Table 2 Student rating of learning experiences**

433

	Educational background		
Learning experience (LE)	School leaver N=76	Graduate N=26	P value
1 I am learning a lot in my 1st year at University	2 (0-100)	2 (0-23)	
2 I have felt overwhelmed by the workload this year	26 (0-100)	32 (0-87)	
3 My lecturers' teaching has usually been clear and understandable	25 (0-81)	28.5 (0-50)	
4 The pace at which the material has been covered has been too fast	42 (0-90)	45 (16-87)	
5 I am less confident than other people to voice my opinion in self directed learning sessions.	67 (2-100)	61 (23-100)	
6 I am not confident enough to voice my opinion in lectures/seminars.	50 (0-100)	57.5 (0-100)	
7 I feel confident to participate in all tasks in practicals.	11 (0-100)	18.5 (0-100)	
8 For my ability (or level of preparation), the course seemed too difficult	**56 (0-100)**	**72.5 (41-100)**	**0.01**
9 This year has been too stressful	50 (0-100)	50 (12-100)	
10 The academic requirements have been too demanding	50 (0-100)	50 (22-100)	
11 I have had relatively little difficulty understanding course material	**50 (2-100)**	**39.5 (4-71)**	**0.0006**
12 The demands on my time and energy have been excessive	43 (0-100)	42.5 (0-86)	
13 I am satisfied with my progress in learning the knowledge and skills needed for a veterinary medical degree	25 (0-84)	23.5 (0-60)	
14 The personal tutor system provides good support.	21 (0-100)	39 (0-66)	
15 My school experience in general prepared me well for my study at University.	**43 (0-100)**	**50 (0-100)**	**0.01**
16 My A-Levels prepared me well academically for my study this year.	35.5 (0-100)	49 (0-100)	
17 My previous degree prepared me well academically for my study this year.	N/A	39 (2-100)	

434 Values indicate median rating (minimum–maximum rating) with options ranging from strongly agree (0) to strongly disagree (100), with

435 neutral at 50. N/A=not applicable. Mann-Whitney U test, two tailed with 95% confidence interval; P values have been given where

436 statistically significant difference.

437

438 **Table 3 Student ratings of support**

	Educational Background			Whole cohort
Student support	School leaver n=76	Graduate n=26	P value	Not aware of service (from n=103)
1 School service - Personal tutor	20 (0-89)	21 (0-71)		0
2 School service - Tutor family	39 (0-100)	50 (0-100)		0
3 School service - Senior tutors	50 (0-100)	34 (0-90)		6
4 School service - Reception	21 (0-73)	16 (0-58)		0
5 School service - Welfare officer	28 (0-100)	27 (0-72)		0
6 School service - Welfare drop-in session	50 (0-100)	50 (0-100)		0
7 School service - Extra mural studies (EMS) placements office	0 (0-50)	0 (0-23)		1
8 School service - Disability officer	50 (0-100)	49 (0-100)		9
9 School service - Teaching, learning and assessments (TLA) office	19.5 (0-100)	15.5 (0-54)		1
10 Peer support - Other students	5 (0-50)	23 (0-50)		1
11 Peer support - Veterinary society (VetSoc)	34 (0-100)	39.5 (0-100)		0
12 University services - Academic support services	50 (0-100)	32.5 (0-100)		11
13 University services - Counselling services	50 (0-100)	45.5 (0-100)		10
14 University services - Financial support service	**50 (0-100)**	**29 (0-56)**	**0.04**	8
15 University services - Student-IT helpdesk	**32 (0-100)**	**16.5 (0-100)**	**0.04**	5
16 University services - Face-to-face IT support (library)	28.5 (0-100)	24 (0-100)		8

439

440 Value represent median (minimum-maximum rating) with options ranging from strongly agree (0) to strongly disagree (100), with

441 neutral at 50. Statistical significance ($P<0.05$) was analysed using Mann-Whitney U test, two tailed with 95% confidence interval, and is

442 indicated where significant. Welfare officer refers to a member of administrative staff who is available to students and can provide non-

443 academic guidance and advice.

444

445 **Table 4 Support systems ranked**

446

		Educational Background	
Student support Ranking		School leaver	Graduate
1 School service - Personal tutor		4	5
2 School service - Tutor family		10	**15**
3 School service - Senior tutors		11*	11
4 School service - Reception		5	3
5 School service - Welfare officer		6	8
6 School service - Welfare drop-in session		11*	**15**
7 School service - Extra mural studies (EMS) placements office		1	1
8 School service - Disability officer		11*	14
9 School service - Teaching, learning and assessments (TLA) office		3	2
10 Peer support - Other students		2	**6**
11 Peer support - Veterinary society (VetSoc)		9	12
12 University services - Academic support services		11*	10
13 University services - Counselling services		11*	13
14 University services - Financial support service		11*	9
15 University services - Student-IT helpdesk		8	**4**
16 University services - Face-to-face IT support (library)		7	7

447

448 *=ranked jointly, ranking data was extrapolated from the rating data given by the students.

449

450 **Table 5a Examination grades (all students)**

Module	Exam Type	Graduate n=25	School leaver n=87	P value
MSK Musculoskeletal[1]	Online	69 (51-93)	64 (42-84)	-
	Spot	**61 (42-84)**	**51 (22-76)**	**0.02**
	Module overall	**66 (46-88)**	**60 (36-81)**	**0.04**
LCB Lymphoreticular Cell Biology[1]	Online	**70 (32-87)**	**61 (32-87)**	**0.04**
	Spot	**66 (47-86)**	**61 (25-89)**	**0.02**
	Module overall	**69 (41-81)**	**62 (35-84)**	**0.01**
CRS Cardiorespiratory[2]	Online	64 (41-82)	59 (37-79)	-
	Spot	64 (32-81)	62 (34-83)	-
	Module overall	66 (39-82)	60 (38-81)	-
NEU Neuroscience[2]	Online	67 (0-90)	64 (35-84)	-
	Spot	72 (31-88)	64 (24-91)	-
	Module overall	69 (10-90)	63 (31-86)	-
AHW Animal Health and Welfare[2]	Online	70 (48-83)	66 (43-81)	-
	Spot	63 (33-89)	59 (22-81)	-
	Module overall	68 (48-82)	64 (38-77)	-
PPS Personal, Professional Skills[3]	IT project	70 (51-77)	67 (45-83)	-
Overall Grade		**68 (40-83)**	**61 (18-81)**	**0.03**

451

452 Values indicate median (minimum-maximum) examination percentage

453 P-value only shown if significant, P<0.05, based on Mann-Whitney U test. [1] 1st

454 assessment period (January); [2] 2nd assessment period (June); [3] course work during term

455 time.

456

457

458 **Table 5b Examination grades (international students excluded)**

Module	Exam Type	Graduate n=21	School leaver n=68	P value
MSK Musculoskeletal[1]	Online	68 (49-93)	67 (43-84)	-
	Spot	60 (32-79)	53 (35-77)	**-**
	Module overall	66 (43-88)	62 (43-81)	**-**
LCB Lymphoreticular Cell Biology[1]	Online	71 (44-85)	63 (45-87)	**-**
	Spot	69 (29-80)	62 (25-89)	**-**
	Module overall	69 (45-81)	63 (46-84)	**-**
CRS Cardiorespiratory[2]	Online	65 (41-79)	60 (37-83)	-
	Spot	64 (32-76)	64 (34-83)	-
	Module overall	66 (39-76)	63 (38-82)	-
NEU Neuroscience[2]	Online	67 (0-90)	64 (35-86)	-
	Spot	65 (31-88)	66 (24-91)	-
	Module overall	69 (10-90)	65 (31-86)	-
AHW Animal Health and Welfare[2]	Online	69 (50-80)	67 (43-83)	-
	Spot	63 (48-89)	63 (22-85)	-
	Module overall	65 (56-77)	65 (38-82)	-
PPS Personal, Professional Skills[3]	IT project	70 (56-77)	68 (45-83)	-
Overall Grade		66(18-83)	63(40-82)	**-**

459 Values indicate median (minimum-maximum) examination mark (percentage). - P-value

460 only shown if significant, P<0.05, based on Mann-Whitney U test. [1] 1st assessment

461 period (January); [2] 2nd assessment period (June); [3] course work during term time.

462

463   **Figure captions:**

464   **Figure 1: Examination grades throughout the year.** Examination results for the first

465   sit assessments in each of the modules in the first year of study. Non-parametric statistical

466   test Mann-Whitney U, two tailed with 95% confidence interval was used and   * indicates

467     $P<0.05$.

468

469   **Figure 2: End of year examination grade position.** End of year grade and percentage

470   of students within both School leaver and graduate groups achieving over 70% (1st), 60-

471   69% (2.1), 50-59% (2.2) and under 50% (traditionally 3rd but a failure to continue in

472   veterinary medicine).

473

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