Multi-Level Impact of Continuing Professional Development on Sri Lanka's Veterinary Sector

A capacity building programme between a veterinary school in the UK and the veterinary school in Sri Lanka was developed. Scholarships for two distance learning MSc programmes were offered to Sri Lankan veterinarians: 'Veterinary Epidemiology and Public Health' and 'Livestock Health and Production'. In addition, scholarships were offered to academic staff members at the veterinary school to undertake the Postgraduate Certificate in Veterinary Education. A blended learning approach was taken, though the majority of learning was by distance. This study used a case-study approach to assess the programmes' impact at different levels: individual, institutional, institution's students, the profession, the public and animals. Previous students were interviewed and current students participated in a focus group. Staff of the Sri Lankan university were interviewed. Data was transcribed and qualitative content analysis conducted. Participants had achieved personal satisfaction, gained new knowledge and skills and progressed professionally. These impacts translated to societal impacts including disseminating understanding of one health, improving animal welfare laws and assisting the development of the undergraduate veterinary curriculum. The graduates from the three blended learning programmes are experts at the centre of a new community of practice and have the ability to inspire future generations of Sri Lankan veterinary surgeons.

Keywords: veterinary; continuing professional development; Sri Lanka; impact; qualitative research; thematic analysis

Introduction

Emerging and long-standing diseases can threaten both animals and humans. These diseases require veterinary intervention for eradication. Many human infectious diseases are zoonotic, meaning they can spread from animals, either domesticated or wild, to humans. Veterinary services are considered 'a global public good' (OIE, 2013), because diseases know no boundaries and cross national, regional and continental boundaries, threatening the global population.

Due to the trust granted to veterinarians to care for animals and the public good, all veterinarians have a professional responsibility to sustain effective veterinary services via continuously updating their knowledge and skills. As such, continuous professional development (CPD) of veterinarians is essential to maintain the veterinary services in any and all countries to the highest standard.

Consequently, there is an international effort to upgrade competencies of both undergraduate and postgraduate veterinarians largely initiated by the Office International des Epizooties (OIE), the World Organisation for Animal Health. The development of the Professional Veterinary Services (PVS) pathway by the OIE, and using PVS as a benchmark to upgrade national veterinary services, has been on-going since 2004 (OIE, n.d.). This global movement is aimed at developing national professional veterinary services and the individual veterinarians who require competencies to address, for example, zoonotic and transboundary animal diseases, animal welfare and public health.

This movement therefore requires capable and knowledgeable teachers. Teaching for enhanced learning requires an understanding of how students learn (Biggs, 1999) and most teachers in higher education need some training in pedagogical knowledge on how best to teach, assess, give feedback and motivate different learners

(Parsons, Hill, Holland, & Willis, 2012). Higher education institutions in some countries have started to train their teachers using workshops, seminars, short training courses and longer formal educational qualifications (Parsons et al., 2012). These training programmes are effective with a positive impact of the training on the teachers and their practice. Recent developments in discipline-specific courses for training the teachers is underpinned by the notion that most teachers consider their teaching to be explicitly linked to subject-domain and research (Jenkins, 1996; Lueddeke, 2003). In the veterinary sector, this is particularly important as the teaching environment can be varied and challenging (Bell, 2013). In a recent study, discipline focused training for the veterinary sector has been perceived as more effective by a group of (trainee) teachers in higher education (Silva-Fletcher & May, 2018).

Qualified veterinarians across the globe therefore require access to veterinary scientific CPD, and the veterinarians teaching undergraduate students require access to education training. However, the capacity to undertake appropriate CPD and post-graduate opportunities by veterinary professionals in some countries is sub-optimal. Restrictions due to financial reasons for the veterinarian, a lack of expertise in the postgraduate education sector and geographical factors, are potentially major contributing factors.

Distance learning as an educational method started nearly 150 years ago to narrow the geographical distance between the teacher and the student to deliver teaching and learning to those who cannot attend a teaching institution (University of London, n.d.). By 1995, distance education had been taken up by at least 10 countries, producing more than 100,000 distance learning students (Keegan, 1996 p4). Comparisons between classroom-based instruction and distance education found that student learning is comparable at outcome levels (Saba, 2000), but student retention was

significantly lower in distance learning programmes. Results of a meta-analysis on distance education that included 232 studies concluded that pedagogical approaches with interactivity either via face-to-face or through other forms of communication may be necessary to enhance retention (Bernard et al., 2004). These pedagogical approaches became more feasible with the advent of internet and sophisticated communication systems. Today, distance education systems have adopted computer-based approaches to foster communication between teachers and students. This combination of two historically separate models of teaching and learning (face-to-face and distance), has led to the emergence of blended learning (Bonk & Graham, 2006). Blended learning can include combining instructional modalities (or delivery media), combining instructional methods and/or combining online and face-to-face instruction (Graham, 2006 p4), and has added more flexibility, student participation and depth of reflection to student learning (Mikulecky, 1998). Motivation is a key factor for students to maintain student retention and engagement in distance learning. Key findings from a large European project (Impact of Distance Education on Adult Learning' project (IDEAL)) show conclusive evidence that increasing attainment levels, improving career prospects and self-fulfilment were the major motivations for adult learners who engaged in distance education (UNESCO, n.d.). This supports Knowles' andragogy model on the concept that adult learners have the ability to be self-directed, are goal oriented, have intrinsic motivation and the desire to control and be responsible for their learning (Knowles, 1980). Thus blended learning approaches can be more suitable for postgraduate training for mature individuals in full-time employment (Darden, 2014).

A common framework for evaluating teaching programmes was developed by Kirkpatrick (1998) and involved consideration of the impact at the level of the individual, from reaction, to learning, to behaviour change, as well as transfer of the

results to society. Utilising the Kirkpatrick model, the impact of CPD in the veterinary field has been specifically considered with regard to evaluation of reflective essays (May & Kinnison, 2015). This adaptation considered the impacts of CPD through levels including the individual, veterinary practice and patient/owner.

This study aimed to use the Kirkpatrick framework and veterinary adaptation to explore the multi-level impact of participating in blended learning CPD programmes in a case study of Sri Lankan veterinarians. The research question was: What is the impact of in-situ postgraduate training using distance learning in the veterinary sector in Sri Lanka?

Materials and Methods

The Descriptive Case Study Approach

Case study research involves using multiple methods (in this project; interviews and focus groups) to study a phenomenon (the impact of distance learning) in an identified 'case' (distance learning CPD programmes for Sri Lankan veterinarians), utilising triangulation (Gorard & Taylor, 2004) of multiple perspectives (current distance learning students, previous distance learning students and university staff) (Stake, 1995; Yin, 2009).

To provide context for this case, Sri Lanka continues to experience several public health issues, for example rabies in the dog population (Kumarapeli & Awerbuch-Friedlander, 2009) and food safety (Kalupahana, Rajapaksa, Fernando, Thilakarathne, & Abeynayake, 2015), which threaten human health. Sri Lanka's research focus has, naturally, been on the issues themselves, and less focus has been given to training veterinarians to address these issues. There is a growing consensus from the Sri Lankan government and the veterinary council (that regulate the veterinary profession) that

CPD for veterinarians needs to be increased and improved, but capacity to undertake CPD for the whole country is limited.

There is only one veterinary school in Sri Lanka; the Faculty of Veterinary Medicine & Animal Science (FVMAS), University of Peradeniya. The four-year undergraduate veterinary training course enrols 80 students yearly (Faculty of Veterinary Medicine & Animal Science - University of Peradeniya, 2014). The student to teaching staff ratio is over 10, which is poor compared to the best ranked universities for student ratios, which are typically in the USA and have ratios of less than 4 *(Times Higher Education*, 2016). It is comparable to two UK veterinary schools, but higher than the others (*The Guardian*, 2017). Postgraduate and CPD training is therefore an additional burden to FVMAS staff. In addition, like many professional training institutions, FVMAS staff receive limited training in education to enable them to teach effectively at both CPD and undergraduate levels.

In 2009, the Commonwealth Scholarship Commission in the UK (CSC), offered funds to develop a capacity building programme (OIE, 2017) between the Royal Veterinary College (RVC), University of London, UK and FVMAS. As part of the programme, Sri Lankan veterinarians are offered scholarship tuition and examination fees to study for MSc in Veterinary Epidemiology and Public Health (MSc VEPH) or MSc in Livestock Health and Production (MSc LHP). For faculty development, further scholarships are offered to academic staff members to undertake the Postgraduate Certificate in Veterinary Education (PGCertVetEd), providing discipline-specific training for teachers in veterinary higher education. All teaching is in English and involves blended learning.

For the MSc programmes (VEPH and LHP), veterinarians are offered a face-to-face induction workshop at the start of the programme and annual teaching workshops

led by teaching staff from the RVC. During these workshops, teaching staff provide lectures and one-to-one revision sessions designed around the veterinarians' needs. Both MScs consist of three core and four optional modules and offer the flexibility to select modules that are most relevant to the needs of the veterinarian. Participants are also offered online tutorials via the RVC's online learning platform on generic (i.e. how to avoid plagiarism) and specific (i.e. Statistical Methods in Veterinary Epidemiology) topics throughout the year. Formative assignments support students throughout their learning, which is invaluable for distance learners (Hatzipanagos & Warburton, 2009). The annual examination is conducted in Sri Lanka, though it is in English and is managed by the British Council office.

The PGCertVetEd is offered to academic staff to develop competencies in teaching and assessment methods, curriculum development, developing clinical skills training and animal-based teaching relevant in veterinary education. The one-year distance learning course consists of monthly units including 'Student Learning', 'Teaching Methods' and 'Assessing Student Learning'. It is comprised of readings, online asynchronous and synchronous discussions, and reflection. Units are assessed formatively through reflective essays. Participants are assessed summatively through reflective assignments, a teaching observation and presentation of a novel teaching idea. Closer links with academic staff acting as tutors is developed through visits to the RVC. The course follows the UK Professional Standards Framework and completion ensures fellowship of the Higher Education Academy.

Study Participants

All Sri Lankan veterinarians who had previously completed the MSc VEPH (n=2), MSc LHP (n=3) or the PGCertVetEd (n=2) were invited to take part in the study.

Veterinarians who were currently studying on any of the courses and who were attending a face-to-face workshop at FVMAS were also invited to participate. These were three veterinarians on the MSc VEPH. In addition, members of FVMAS faculty were also approached to provide a university perspective on the impacts of the programmes. These were the Dean at the time of implementation of the CSC funded capacity building programme, the current Dean and the Senior Lecturer who is the coordinator of the capacity building programme [RK].

Participants were informed that the study aimed to primarily investigate the impact of completing the named CPD programmes. The project received ethics approval from the RVC's ethics and welfare committee, REF URN 2016 1575. Participants were provided with a consent form and made aware of the option to opt out.

Methods

Face-to-face semi-structured interviews were conducted in Sri Lanka in 2016 with the veterinarians who had completed one of the distance learning programmes and with the faculty members. A focus group, to allow for interaction regarding the current year's cohort's experiences, was held with those veterinarians currently undertaking the MSc VEPH. The interviews and focus group were conducted by [Author], a researcher experienced in these methods, but who had no prior connection to the capacity building programme and was not involved in course teaching.

The interviews and focus group were audio recorded and transcribed by [Author]. English was used for all interviews and focus groups, and although not the first language for the participants, all participants were fluent, as they learn English at school and conduct their veterinary undergraduate and postgraduate studies in English.

Interviews – Graduated veterinarians and Faculty members

The interview schedule began with an open question asking the participant to describe the impact of completing the CPD course. Utilising the framework and veterinary adaptation described in the Introduction (Kirkpatrick, 1998; May & Kinnison, 2015), participants were prompted where required to consider the impacts of the CPD through a range of levels: themselves, and society - via their institution, their students, their profession, the public and animals.

The interview schedule ended with questions regarding challenges of completing or offering the course, and suggestions for the future, including potential improvements.

Focus Group – Veterinarians currently undertaking the MSc VEPH

The focus group schedule began with an open question to explore the motivations and expectations of the veterinarians regarding the distance learning MSc VEPH. Anticipated impacts of the course and achieved impacts were then explored. The focus group also ended with questions regarding challenges of undertaking the course and potential improvements.

Analysis. This study sought to explore the lived experiences of the distance learning CPD participants, to aid understanding of the impact of this opportunity, within the context of the Sri Lankan veterinary sector. This understanding was constructed socially by the participants and researcher through the interviews and generation of categories, and therefore the study is consistent with the social constructivism approach. A manifest deductive qualitative content analysis (Elo & Kyngäs, 2008) was performed on all the transcripts, utilising triangulation to bring together results from the different methods (interviews and focus groups) and stakeholders (current students, previous students, university staff). 'Manifest'

means that voice was given to the participants using their own words. 'Deductive' means that analysis utilised pre-determined theories. In this case, it followed the structure of the interview through Kirkpatrick's (1998) evaluation of teaching model, and the adaptation by May and Kinnison (2015), to guide the analysis within three main sections: 'Motivation and Expectations', 'Impact' and 'Challenges and Improvements of the Course'. Analysis was conducted by [Author] who had developed unique understanding through conducting and transcribing the interviews, but who was unbiased towards the outcomes of the results, being uninvolved in the course delivery. Quotes from the transcripts are utilised in the Results to highlight the dependability (Lincoln & Guba, 1985) of the research.

In addition, participant checking was undertaken by emailing the participants a copy of their transcript and initial analysis in the form of summary tables. Two respondents replied; one faculty member and one veterinarian currently undertaking the MSc VEPH. Both agreed that the main points from their participation had been included, and made minor corrections to transcripts/summaries to ensure accuracy.

Results

Four of the five veterinarians who completed the MSc VEPH or LHP participated and the two veterinarians who completed the PGCertVetEd participated. Details of the participating graduates can be seen in Table 1. They have been given the codes G1-G6 to aid anonymity but to demonstrate the speaker of quotes in the following sections. All three veterinarians who attended the workshop as current students of the MSc VEPH participated in a focus group. Their details are also included in Table 1 (codes S1-3). All

three university faculty members participated. The Coordinator and previous Dean are both female, the current Dean is male. They have been randomly given the codes F1-F3.

[Insert Table 1 about here]

In the following sections, the categories and sub-categories relating to each topic will be explored. These sections are summarised in Table 2.

[Insert Table 2 about here]

Motivation and Expectations

Career Progression

There was a general motivation of the veterinarians to undertake postgraduate study to enable progression in their careers. It was recognised that a postgraduate award, particularly an MSc, is helpful (indeed some participants thought it was a requirement) for getting access to jobs such as lectureships and Government work. The participants were specifically motivated to train in an area relevant to their day-to-day work. The public health nature of the two MScs was therefore seen as particularly important:

> It's an additional qualification to go up in the ladder and I don't want to shift back to the animal husbandry and the production area, so I will continue to be a public health veterinarian, and this course will help. S1

Opportunities Provided by Distance Learning and Scholarships

For many, the scholarship funding made studying possible. The distance learning nature of the courses was also cited as being vital for their feasibility. The veterinarians were

not in a position to move country, and were aware that a qualification from a prestigious international university would be beneficial to their status and career choices:

> I also had the intention of joining the government sector, but that was changed … applications were called for government sector, but because I invested a lot of money on my private practice, I couldn't … I wanted to do a postgraduate study … and I couldn't go abroad … rather than doing something in Sri Lanka, I thought it's much more standard doing something connected to a foreign country like UK. S2

The faculty considered the courses a cost effective strategy of educating veterinarians who would stay in Sri Lanka and disseminate their knowledge for the betterment of the country.

Few Expectations and a Lack of Preparedness

The veterinarians had few expectations, but did expect the course to be tough and to require them to work on their own, online. Their lack of expectations perhaps led to their unpreparedness. They felt specifically underprepared for their first face-to-face workshop, because they were unsure what they should know at this point. This is revisited in the 'Challenges and Improvements' section.

Impact of Completing a Distance Learning Course

Impact on Yourself

Personal Development. There was an emotional change (Kirkpatrick Level 1 - reaction) to completing the course including a sense of enjoyment and pride as described in the following quote:

> I am very happy and the other thing is I am proud of my MSc because I know I am a member of the University of London, that's a dream of mine. G3

The graduates also described their growth in knowledge and understanding gained from the course (Kirkpatrick Level 2 - learning), especially relating to new topics: education (PGCertVetEd) and animal welfare (MScs). Completing the courses allowed them to achieve personal goals and raised their status. It also promoted positive feelings for their future, as outlined in the following:

> I have undecided to do any postgraduate degrees at the moment, but I think I can do it because I have the knowledge I can do good research and prepare a good thesis. G1

Personal Opportunities. Completing the course also provided some personal opportunities, primarily relating to travelling to the UK and visiting the RVC, which was seen as useful as it provided insight into schools in other countries.

Career Development. Some graduates expanded their current role (Kirkpatrick Level 3 - behaviour), for example, G5 wrote a grant to develop a clinical skills laboratory at the university. This is also an example of networking, as the grant was developed jointly with the staff from the RVC's PGCertVetEd team and others from the University of Peradeniya. Other graduates explained how they have been able to progress onto more prestigious jobs, including joining the Ministry, due to their new status and their MSc degree. Via the scholarship, one participant first became a lecturer and then went onto become a Veterinary Investigation Officer, based on this degree:

> I was selected as a lecturer [at an animal husbandry school] because of the MSc. They only take MSc qualified people as lecturers…. this degree was very much helpful for me for my career development, because I always got the help of this degree to achieve my targets…Only a very small segment of people are given sponsorship, otherwise you can't do it…. it directly helped me to develop as a veterinarian and go to 'Class One Level' [a veterinary surgeon with an MSc or significant experience]. G4

Impact on Your Institution/University

The results from all the following contexts represent Kirkpatrick's Level 4 – transfer and impact on society.

The results for this context are largely from the three faculty staff members as well as the two PGCertVetEd graduates. However, thoughts of the MSc graduates were also relevant as a number of these individuals have become visiting lecturers for the department on the undergraduate veterinary course.

Improvement in Teaching. This category included graduates disseminating their new knowledge to their colleagues, and other junior staff members who were not undertaking the full course but were able to attend the MSc face-to-face workshops. Several instances of changes in teaching methods were noted. The development of the clinical skills laboratory, for which G5 gained funding, was considered to have a large impact on the institution. The teaching materials and literature provided by the course was also made available (under agreement) to other faculty staff, many of whom used it to develop their teaching. The two graduates of the PGCertVetEd became heavily involved in faculty development and utilised their knowledge from this course within their expanded role.

Fostering Collaborations. Not only were collaborations developed when graduates became guest lecturers, but participation in the partnership program encouraged further collaborations between the universities, leading to the development of new teaching materials and published papers.

Strengthening the Faculty. The two MSc courses strengthened the faculty's public health status in the country:

> The veterinary public health animal epidemiology had been a weak area in the country, and the faculty, so this programme, there were many other programmes which strengthened epidemiology, but this really helped. F2

Involvement in running the courses strengthened the administration within the Veterinary Faculty and helped the staff to mature:

> I think in a way [the courses] are kind of useful for the development of our department, because having a workshop, we get experience. Not only me, other staff members as well in the department, we get the feeling how to carry out the workshop, how to run the project, how to deal with all these things. F3

Impact on the University's Students

The impacts to undergraduate students follow the impacts of improving teaching as explored in the previous section.

Broadening Students' Understanding. The faculty staff and MSc graduates who had become guest lecturers described broadening students' understanding. The MSc graduates were able to pass on their knowledge to students, and this was typically in areas underexplored in the current curricula, including animal welfare and risk analysis. It was anticipated that exposure to the graduates might give current students the insight and inspiration to go on to postgraduate study. The CPD course teaching materials were again mentioned as being useful for developing new lectures.

Educational theory based teaching benefits students. The two graduates of the PGCertVetEd relayed how they learned about educational theory and implemented it into their teaching, for example:

> we went into the theory – deep learning and student centred learning- and I've been trying to apply some of them in my lectures, and especially in the practical classes… we've been giving them some more formative assessments. G6

There were observed and perceived benefits for students, including enjoyment, improved engagement and better performance:

> I teach statistics, a difficult area for biological students … if I go with the examples and the analysis … they can grab the concept and that would be easy for them to understand. And I think that that worked really well and they enjoyed learning more statistics!... They really like the training they received in the skill lab and also we did a research study to compare groups of students who did not receive the training prior to going to live animals versus the students who obtained the training on the skills models stations, and we really saw a difference in their performance. G5

G5 is currently undergoing the process of publishing the results from this study.

Impact on Society – The Veterinary Profession

Current Situation Benefits from my Knowledge. Public health and One Medicine are growing concepts in Sri Lanka and the knowledge the MSc graduates gained from the course is used in their day-to-day life as veterinarians in the Government and private sector. The up-to-date nature and relevance of their new knowledge was seen as especially important. Some graduates were members or presidents of country-wide associations, where they could share their knowledge and drive development.

Educating Colleagues. Through disseminating their knowledge, the graduates could educate their colleagues. For example, one graduate said:

> because of this knowledge, working for those committees and everything, it helped me a lot. I have educated my colleagues …[including] new recruits to the Government, we do induction training for them where I do lectures [on] livestock production systems and also the legal side of it. G2

Future Plans. Sri Lanka is in the process of developing its veterinary public health sector and the faculty members identified the important position that these graduates hold for its development:

> We still don't have a veterinary public health service in the country, but there is a lot of discussion going on about that, now we already have some group of people graduated with a very good background in veterinary public health, so I think they can contribute, and also they are in different fields, they are in the ministry, some are in the government service, some in the private sector, so when we start with our veterinary public health service, this group has a big opportunity to get into these positions and also I think they can help the others. F3

Impact on Society – The Public

Increased Public Awareness. Through private practices, visits to schools and media performances, the graduates were able to increase public awareness and understanding of two important areas: public health and animal welfare. For example:

> I feel that I could educate my clients, which I'm interacting with most of the time, and I did some programmes in schools as well … explaining the current concepts and the importance of different zoonotic outbreaks. G1

The ongoing implications of this on animal welfare are explored in the following section.

Benefits for Farmers – Production. The MSc LHP can also impact on farmers. Production was cited as an important area in Sri Lanka and the increased knowledge of the graduates, spread to farmers, was anticipated to assist with livestock production in the country.

Impact on Animals

Personal Understanding and Behaviour. Animal welfare was an area relatively unexplored in the undergraduate veterinary curricula until recently. These graduates were therefore unaware of many of the main concepts until they completed the course.

Their natural affinity with the subject was apparent and they indicated a change in their behaviour (Kirkpatrick Level 3), including refusing to perform certain cosmetic surgeries at their private practices.

Dissemination of Animal Welfare Knowledge. The graduates took every opportunity to talk about animal welfare; student lectures, One Medicine/Health situations, with family and with the public:

> I did animal welfare, I liked that subject, and because of that I was able to teach animal welfare to the third year students… I feel that's a good thing, we can start with the students and they will grow that idea and one day, everybody will concern about animal welfare. G3

Changing Animal Use. G5, who developed the new clinical skills laboratory, clarified that allowing students to practice techniques on models will reduce harm to live animals. Another participant explained their integral role in developing a new Animal Welfare Act in Sri Lanka:

> we had only Cruelty to Animals Ordinance, that was a very old one, so we are in the process of preparing a new Animal Welfare Act. So in that Act there are different parts, though it seems I had that animal welfare theoretical knowledge, so I applied that and still I am applying it to regulate new regulations; it helped me a lot. G2

Challenges and Improvements of the Courses

Personal Challenges

Personal challenges revolved around a lack of time due to other commitments including work and family. While there is little that can easily improve this situation, one suggestion related to reducing the number of long written tasks set online, and the introduction of more short answer (preferably tick box) quizzes.

Distance Learning Challenges

Adjusting to Distance Learning. The veterinarians had to adjust to distance learning, as it is completely different from the style of learning to which they are accustomed:

> The most challenging thing was, we were used to formal lectures when we were undergraduates, lecturers come, they give lectures, they give us notes, or even they … guide us, … and at that time also we were listening and then we go and study and do our exams, but here it was totally different, we have to learn by ourselves and we have only one workshop annually, so we have to gather everything from that workshop. S2

Specifically, they suggested that distance learning relied more heavily on self-directed reading and was prone to distractions. The volume of reading was challenging to some and a suggestion was to include live or recorded audio or video files to cover the most important points. Receiving qualitative feedback rather than quantitative (grades/marks) feedback was also challenging, and more frequent but smaller assignments with feedback was suggested to aid engagement and understanding of their learning gain. Veterinarians experienced some issues in getting an answer to a query in a timely manner. Increased access to tutors, perhaps through email, was identified as a desired improvement.

Internet Access. Some participants worked in rural locations and had no internet connection, which severely limited their time for study. Other issues mentioned related to live links and communication. The following quote sums up many of the distance learning challenges:

> When I was doing the course, actually my wife, she helped me a lot, she understood my things. Because at that time she was pregnant, and we had one child, with all these things she managed my house and she allowed me to learn. … we had to read more as a distance learning student, we didn't have a teacher and always we had to contact our teachers and at that time I was a field veterinarian in a rural area, actually I didn't have

> even internet. Sometimes my phone signal was also not there. Internet became a very big barrier for me. G4

Specific Challenges of the Courses

For Veterinarians. Some of the topics under study were noted to be especially difficult, and prone to cause stress. For the MScs, this tended to be the statistics courses. Veterinarians from the PGCertVetEd described the challenges understanding a whole new area of research – education – and having to write about it in a new way – through reflective patches. The timing of some aspects of the MSc courses, primarily the first workshop, was also questioned; participants would have liked to have been better informed about how to prepare for the first workshop. More face-to-face workshops were also requested. Relating to the course content, one participant highlighted how some content was UK centric; however, this was not a complaint, as they felt they should learn about the situation in other countries as well as in Sri Lanka. Some comments also related to specifics of the assessment, including mark allocation and question choice.

For Faculty Members. There was concern that well performing students on the course were occasionally offered other positions (PhDs) and chose to leave the course. On the other extreme, there was concern over under-performing students, who also dropped out. One faculty member suggested the requirement of an 'agreement to complete', signed before undertaking the course.

To extend the current benefits, one faculty member suggested yearly meetings of the graduated veterinarians to build a community of practice. There was also a general desire for more topics and opportunities to be offered to Sri Lanka, including at PhD

level. Suggested topics included laboratory work, poultry and clinical subjects for faculty staff.

Discussion

This case study of Sri Lankan veterinary blended learning programmes demonstrates that in the short time since completing their studies, the graduates have seen a wealth of impacts on a variety of levels. They have achieved personal satisfaction, gained new knowledge and skills and have progressed in either their current roles or have gained more prestigious jobs. The personal impacts have also translated to societal impacts. In addition to the PGCertVetEd graduates who were employed by the University, many of the MSc graduates have also demonstrated their enthusiasm to inspire the future generation of veterinarians by becoming lecturers. Impacts on the institution and its students were therefore clear. More widely, the profession, and the potential development of a veterinary public health service in the country, will benefit from the breadth and depth of knowledge that these individuals have gained and are determined to disseminate. The public and the animals of Sri Lanka are also already benefiting through increased understanding of public health and animal welfare and through changes in animal use at local and national levels.

Although the knowledge gained through these courses is self-reported, success in summative exams and graduation from these courses corroborates reports on learning gain, and senior faculty feedback regarding the wider impacts triangulates with participant derived data. As with other online public health courses, the relevance and up-to-date nature of the knowledge was seen as important for transferring the knowledge to daily work (Sears, Cohen, & Drope, 2008). Through gaining an MSc qualification, via distance learning, associated with an international university, career

progression was made relatively easy, reflecting the known motivator for distance education of improving career prospects (UNESCO, n.d.). None of the participants were in a position to move abroad or pay for a degree from a well-renowned university, therefore this would not have been possible without the scholarships. This corroborates previous research that distance learning for upgrading healthcare workers' skills has been shown to have benefits including not uprooting the learner (Nartker et al., 2010).

These individual benefits extended to other stakeholders. Dissemination of new knowledge was a primary goal of one participant in particular and was an identified impact for all participants. The audiences included students and faculty within the university. These results mirror research in human healthcare which has indicated that postgraduate education qualifications can improve individual preparedness and involvement in educational practices (Sethi, Schofield, Ajjawi, & Mcaleer, 2015). The current study also demonstrated changes in teaching methods and similar increased involvement in research and publications.

Knowledge was also disseminated to colleagues, including members of the profession, such as new graduates as well as members of larger multi-professional teams. Without using the terminology, it was acknowledged that these graduates are the experts at the centre of a new community of practice (Wenger, 1998) reaching out to their colleagues in the field.

It was evident from the results regarding personal development and personal opportunities that these participants were incredibly intrinsically motivated to complete the course; it was described as a 'dream'. The relevance of the course to the participants' daily lives was an important part of the courses' success (Kember, Ho, & Hong, 2008; Mittelmeier et al., 2018).

Participants were also extrinsically motivated to make a difference within Sri Lanka's veterinary sector, an example of which was disseminating knowledge to the public. Increased awareness of public health and animal welfare issues is an important endeavour to cultivate change, and previous interventions for Sri Lankan school children, similar to the initiative of G1, have been shown to help (Kanda et al., 2015). Animal welfare is a topic which is growing within veterinary curricula worldwide. For example, two veterinary schools in Turkey introduced animal welfare as its own topic in 2004 (Gurler, 2007). Animal welfare has also evolved in Latin American schools in recent years, but it is reported that its inclusion is limited due to a lack of teachers with appropriate animal welfare knowledge (Tadich, Molento, & Gallo, 2010). The knowledge gained by these MSc graduates, has provided the University of Peradeniya with a supply of well-educated and enthusiastic lecturers.

There are limitations to the nature of this case study research. With only five graduates, this represents an early indication of the potential of the project. The self-reported nature of the impacts has already been mentioned. However, the multiple perspectives provided by graduates of different courses, with different career paths, and by faculty members of the university allow for triangulation (Gorard & Taylor, 2004) of data and a fuller understanding of the phenomenon under study, strengthening the credibility (Lincoln & Guba, 1985) of the results.

The study has a significant advantage, in that it considers multiple levels of Kirkpatrick's evaluation of teaching (Kirkpatrick, 1998). This demonstration of the variety of societal impacts of courses is rare, with the majority of educational evaluation studies in many areas focusing on lower levels and underreporting an evaluation of results to society (Hammick, Freeth, Koppel, Reeves, & Barr, 2007; Miller & Archer, 2010; Steinert et al., 2006). The study also has similarities to other distance learning

courses which span very different cultures. The results indicate that this collaboration between a UK and Sri Lankan veterinary school has been successful, and may be in part attributed to achieving some of the suggestions for learning design in diverse cultural contexts, such as addressing the needs of the learners in terms of their diverse work and life patterns of participants (Mittelmeier et al., 2018), and allowing them to continue their studies in their own country (Ramadan, 2016), which for many makes part-time distance learning their only option, not a choice (Butcher & Rose-Adams, 2015).

In conclusion, the impacts identified by this study are beginning to demonstrate the success of blended learning based training programmes. The next stage of the project will be to compile a questionnaire based on these findings which will be sent to all international graduates of these courses. It is also anticipated that these results will embolden the continuation of the programme, will encourage other veterinarians to consider postgraduate courses and will inspire other universities to provide online distance learning, with international sponsorships, on a variety of global issues.

Geolocation

This study was conducted at the University of Peradeniya, Peradeniya, 20400, Sri Lanka

Declaration of Interest

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References

Bell, C. E. (2013). Faculty development in veterinary education: are we doing enough (or publishing enough about it), and do we value it? *Journal of Veterinary Medical Education*, *40*(2), 96–101.

Bernard, R. M., Abrami, P. C., Lou, Y., Borokhovski, E., Wade, A., Wozney, L., … Huang, B. (2004). How Does Distance Education Compare With Classroom Instruction? A Meta-Analysis of the Empirical Literature. *Review of Educational Research*, *74*(3), 379–439.

Biggs, J. (1999). What the Student Does: teaching for advanced learning. *Higher Education Research & Development*, *18*(1), 57–75.

Bonk, C. J., & Graham, C. R. (2006). *Handbook of blended learning: Global Perspectives, local designs*. San Francisco, CA: Pfeiffer Publishing.

Butcher, J., & Rose-Adams, J. (2015). Part-time learners in open and distance learning: revisiting the critical importance of choice, flexibility and employability. *Open Learning: The Journal of Open, Distance and e-Learning*, *30*(2), 127–137.

Darden, D. (2014). Relevance of the Knowles Theory in Distance Education. *Creative Education*, *5*, 809–812.

Elo, S., & Kyngäs, H. (2008). The qualitative content analysis process. *Journal of Advanced Nursing*, *62*(1), 107–115.

Faculty of Veterinary Medicine & Animal Science - University of Peradeniya. (2014). Faculty of Veterinary Medicine & Animal Science, University of Peradeniya. Retrieved June 16, 2016, from http://vet.pdn.ac.lk/

Gorard, S., & Taylor, C. (2004). What is “triangulation”? *Building Research Capacity*, *7*, 7–9.

Graham, C. R. (2006). Blended learning systems: Definition, current trends and future directions. In C. J. Bonk & C. R. Graham (Eds.), *Handbook of blended learning: Global Perspectives, local designs.* San Francisco, CA: Pfeiffer Publishing.

Gurler, A. M. (2007). Animal welfare education in Turkey. *Journal of Veterinary Medical Education*, *34*(5), 633–638.

Hammick, M., Freeth, D., Koppel, I., Reeves, S., & Barr, H. (2007). A best evidence systematic review of interprofessional education: BEME Guide no. 9. *Medical Teacher*, *29*(8), 735–751.

Hatzipanagos, S., & Warburton, S. (2009). Feedback as dialogue: exploring the links between formative assessment and social software in distance learning. *Learning, Media and Technology*, *34*(1), 45–59.

Jenkins, A. (1996). Discipline-based educational development. *International Journal for Academic Development*, *1*(1), 50–62.

Kalupahana, R. S., Rajapaksa, D. I. G., Fernando, P. S., Thilakarathne, D. S., & Abeynayake, P. (2015). Occurrence and characterization of nontyphoidal Salmonella in retail table eggs in Kandy district of Sri Lanka. *Food Control*, *72*, 244–248.

Kanda, K., Obayashi, Y., Jayasinghe, A., Gunawardena, G. S. P. D. S., Delpitiya, N. Y., Priyadarshani, N. G. W., … Tamashiro, H. (2015). Outcomes of a school-based intervention on rabies prevention among school children in rural Sri Lanka. *International Health*, *7*(5), 348–353.

Keegan, D. (1996). *Foundations of distance education* (3rd ed.). London, UK: Routledge.

Kember, D., Ho, A., & Hong, C. (2008). The importance of establishing relevance in motivating student learning. *Active Learning in Higher Education*, *9*(3), 249–263.

Kirkpatrick, D. . (1998). *Evaluating Training Programs: The Four Levels* (2nd ed.). San Francisco: Berrett-Koehler.

Knowles, M. S. (1980). What is andragogy? In *The Modern Practice of Adult Education: From Pedagogy to Andragogy Revised and Updated* (pp. 44–45). Cambridge: Prentice Hall Regents, Englewood.

Kumarapeli, V., & Awerbuch-Friedlander, T. (2009). Human rabies focusing on dog ecology—A challenge to public health in Sri Lanka. *Acta Tropica*, *112*(1), 33–37.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Newbury Park: SAGE Publications, Inc.

Lueddeke, G. R. (2003). Professionalising Teaching Practice in Higher Education: A study of disciplinary variation and "teaching-scholarship." *Studies in Higher Education*, *28*(2), 213–228.

May, S. A., & Kinnison, T. (2015). Continuing professional development : learning that leads to change in individual and collective clinical practice. *Veterinary Record*.

Mikulecky, L. (1998). Diversity, discussion, and participation: Comparing web-based and campus-based adolescent literature classes. *Journal of Adolescent & Adult Literacy*, *42*(2), 84–97.

Miller, A., & Archer, J. (2010). Impact of workplace based assessment on doctors' education and performance: a systematic review. *BMJ*, *341*.

Mittelmeier, J., Long, D., Cin, F. M., Reedy, K., Gunter, A., Raghuram, P., & Rienties, B. (2018). Learning design in diverse institutional and cultural contexts:

suggestions from a participatory workshop with higher education professionals in Africa. *Open Learning: The Journal of Open, Distance and e-Learning*, *33*(3), 1–17.

Nartker, A. J., Stevens, L., Shumays, A., Kalowela, M., Kisimbo, D., & Potter, K. (2010). Increasing health worker capacity through distance learning: a comprehensive review of programmes in Tanzania. *Human Resources for Health*, *8*(1), 30.

OIE. (n.d.). The OIE PVS Pathway. Retrieved January 31, 2017, from http://www.oie.int/support-to-oie-members/pvs-pathway/

OIE. (2013). *Fact sheets Good veterinary governance*.

OIE. (2017). Support to OIE Members. Retrieved January 31, 2017, from http://www.oie.int/en/support-to-oie-members/

Parsons, D., Hill, I., Holland, J., & Willis, D. (2012). *Impact of teaching development programmes in higher education. HEA Research Series*.

Ramadan, R. (2016). Syrians' acceptance of digital lectures: a case study. *Open Learning: The Journal of Open, Distance and e-Learning*, *31*(1), 9–24.

Saba, F. (2000). Research in distance education: A status report. *International Review of Research in Open and Distance Education*, *1*(1), 1–9.

Sears, K. E., Cohen, J. E., & Drope, J. (2008). Comprehensive evaluation of an online tobacco control continuing education course in Canada. *The Journal of Continuing Education in the Health Professions*, *28*(4), 235–240.

Sethi, A., Schofield, S., Ajjawi, R., & Mcaleer, S. (2015). How do postgraduate qualifications in medical education impact on health professionals? *Medical*

Teacher, *00*(00), 1–6.

Silva-Fletcher, A., & May, S. A. (2018). Discipline-specific compared to generic training of teachers in higher education. *Journal of Veterinary Medical Education*, *45*(1), 1–12.

Stake, R. E. (1995). *The Art of Case Study Research*. Thousand Oaks: SAGE Publications, Inc.

Steinert, Y., Mann, K., Centeno, A., Dolmans, D., Spencer, J., Gelula, M., & Prideaux, D. (2006). A systematic review of faculty development initiatives designed to improve teaching effectiveness in medical education: BEME Guide No. 8. *Medical Teacher*, *28*(6), 497–526.

Tadich, N. A, Molento, C. F. M., & Gallo, C. B. (2010). Teaching animal welfare in some veterinary schools in Latin America. *Journal of Veterinary Medical Education*, *37*(1), 69–73.

The Guardian. (2017). University guide 2017: league table for veterinary science. Retrieved March 7, 2017, from https://www.theguardian.com/education/ng-interactive/2016/may/23/university-guide-2017-league-table-for-veterinary-science

Times Higher Education. (2016). Top 100 universities with the best student-to-staff ratio. Retrieved March 7, 2017, from https://www.timeshighereducation.com/student/news/top-100-universities-best-student-staff-ratio

UNESCO. (n.d.). 'Impact of Distance Education on Adult Learning' project (IDEAL). Retrieved December 3, 2018, from http://uil.unesco.org/adult-education/impact-distance-education-adult-learning-project-ideal

University of London. (n.d.). History of University of London. Retrieved December 3, 2018, from https://london.ac.uk/about-us/history-university-london

Wenger, E. (1998). *Communities of Practice: Learning, meaning and identity*. Cambridge: Cambridge University Press.

Yin, R. K. (2009). *Case Study Research: Design and methods* (Fourth). Los Angeles: SAGE Publications, Inc.