
# OPTIMIZING WORK-BASED LEARNING IN VETERINARY UNDERGRADUATE STUDIES BY IDENTIFYING FACTORS AND ISSUES THAT CONTRIBUTE TO THE EXPERIENCES OF STUDENTS, PLACEMENT PROVIDERS, AND FACULTY

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Roll No: 119/01
Registration No: 643
Session: 2019-2020

**A thesis submitted in the complete fulfilment of the requirements for the degree of Master of Science in Epidemiology**

**Department of Medicine and Surgery**
**Faculty of Veterinary Medicine**
**Chittagong Veterinary and Animal Sciences University**
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**June, 2020**

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# OPTIMIZING WORK-BASED LEARNING IN VETERINARY UNDERGRADUATE STUDIES BY IDENTIFYING FACTORS AND ISSUES THAT CONTRIBUTE TO THE EXPERIENCES OF STUDENTS, PLACEMENT PROVIDERS, AND FACULTY

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# Dedication

To my beloved **parents**
who have been
**dedicating**
themselves
still now to
**my success**

# Acknowledgments

First and foremost, praises and thanks to Almighty Allah, for His showers of blessings throughout my research work to complete this successfully for the degree of Master of Science (MS) in Epidemiology.

I would like to acknowledge my indebtedness and render my warmest thanks to my supervisor Dr. Md. Ahasanul Hoque, Professor, Department of Medicine and Surgery, Chattogram Veterinary and Animal Sciences University, for giving me the learning opportunity and providing invaluable and intellectual guidance and encouragement throughout this research. His dynamism, vision, sincerity and motivation have deeply inspired me.

I'm unable to express enough gratuities to my co-supervisor Dr. Sarah Baillie, Professor (Emeritus) of Veterinary Education, Bristol Veterinary School, UK, for her continuous support and teaching me intensely about qualitative research with the utmost patience. I truly appreciate her enthusiasm, motivation and immense knowledge, and much obliged for her friendly guidance and expert advice throughout the research and writing of this thesis.

Sincere thanks to CIVME team members, including Professor Nitish Debnath (CVASU), Professor Sawkat Anwer (Tufts University Cummings School of Veterinary Medicine, USA), José Ciappesoni (Universidad de Buenos Aires, Argentina), David Charles (Bristol Veterinary School, UK) who have contributed to this study in different ways from the beginning with various suggestions to guide this research in the right course.

Heartfelt gratitude to the the Director of External Affairs, Professor Dr. A. K. M. Saifuddin for his cooperation in conducting the study.

I express profound gratefulness to Professor Dr. Mohammad Yousuf Elahi Chowdhury, Head, Department of Medicine and Surgery and all the faculty members for their support. Many thanks to the MS examination committee too.

I am extending my thanks to the survey respondents (DVM students of session 2013-14) and focus group discussion participants (recent graduates, faculty members from different departments, and especially the placement providers from Upazila Veterinary Hospitals, RV&FC, poultry hatchery, National zoo, private veterinary clinic and dairy farm).

This MS research study was supported by **The Council on International Veterinary Medical Education (CIVME)'s Educational Research Grant from the American Association of Veterinary Medical Colleges (AAVMC)**. It provided me with a tremendous opportunity to be a part of the collaborative platform among CVASU (Bangladesh), Bristol Veterinary School (UK), Tufts University Cummings School of Veterinary Medicine (USA) and Universidad de Buenos Aires (Argentina). I'm extremely grateful to CIVME and AAVMC for their support in this significant educational research work.

Finally, conveying love from the bottom of my heart to my friends, colleagues and well-wishers, in particular Dr. Rashed, Dr. Helal, Dr. Mohsin, Dr. Sanjib, Dr. Ovi, Dr. Mili, Miss Nusrat and Mr. Jalal for their sensational support throughout this journey.

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# List of abbreviations

| Abbreviation | Elaboration |
|---|---|
| % | Percentage |
| ≤ | Less than or equal to |
| AAU | Addis Ababa University |
| AAVMC | American Association of Veterinary Medical Colleges |
| AVBC | Australasian Veterinary Boards Council |
| AVMA | American Veterinary Medical Association |
| BAU | Bangladesh Agriculture University |
| BLRI | Bangladesh Livestock Research Institute |
| CCBDF | Central Cattle Breeding and Dairy Farm |
| CDIL | Central Disease Investigation Laboratory |
| CE | Continuous Education |
| CGPA | Cumulative Grade Point Average |
| CIVME | Council on International Veterinary Medical Education |
| COE | Council on Education |
| CVH | Central Veterinary Hospital |
| DVM | Doctor of Veterinary Medicine |
| EAEVE | European Association of Establishments for Veterinary Education |
| EMS | Extramural study |
| EPT | External Practical Training |
| ESEVT SOP | Standard Operating Procedures of the European System of. Evaluation of Veterinary Training |
| FGD | Focus Group Discussion |
| IM | Intra-muscular |
| IV | Intravenous |
| KKU | Khon Kaen University |
| MOU | Memorandum of understanding |

| | |
|---|---|
| MS | Master of Science |
| MVC | Madras Veterinary College |
| MW | Mann Whitney |
| NCTA | National Council for Technological Awards |
| NGO | Non-government Organization |
| OIE | Office International des Epizooties (World Organization for Animal Health) |
| OSCE | Objective Structured Clinical Examination |
| P | Probability |
| PBAP | Practice-based Ambulatory Program |
| RCVS | Royal College of Veterinary Surgeon |
| RV&FC | Remount Veterinary and Farm Corps |
| SC | Sub-cutaneous |
| TANUVAS | Tamil Nadu Veterinary and Animal Sciences University |
| TCSVM | Tufts Cumming School of Veterinary Medicine |
| TTPHRC | Teaching and Training Pet Hospital and Research Center |
| TVH | Teaching Veterinary Hospital |
| UCD | University College Dublin |
| UCVM | University of Calgary Faculty of Veterinary Medicine |
| UK | United Kingdom |
| UPM | University Putra Malaysia |
| USA | United States of America |
| USG | Ultrasonography |
| UVH | Upazilla (sub-district) Veterinary Hospital |
| VACS | Veterinary Ambulatory Community Service |
| VC&RI | Veterinary Research and Training Institute |
| WBL | Work-based learning |

# Summary

A work-based learning (WBL) programme, typically known as the internship programme, is an integral part of Doctor of Veterinary Medicine (DVM) curriculum in Bangladesh. It mostly refers to external work-placements undertaken by final year DVM students away from the university, rather than clinical rotations in the veterinary teaching hospital or as part of a formalized distributed model curriculum. Work-based learning provides relevant contemporary experience of working environments and helps prepare veterinary students for a range of careers. It has many potential benefits for students including developing invaluable skills (clinical, production, personal, cultural and professional) and providing a greater awareness of the profession and future employment opportunities. Since the WBL programme was introduced to the DVM curriculum at CVASU in 1995-96, there has been no systematic scientific evaluation undertaken to check the effectiveness. The current study is the first in-depth and instructive research work and was conducted in 2019-2020 with the aim of optimizing the WBL programme at CVASU, as well as all veterinary institutions in Bangladesh, by evaluating the existing programme and identifying the benefits, challenges, options and perspectives of all relevant stakeholders.

A comprehensive online survey was conducted on the final year DVM students of CVASU who had recently successfully completed their WBL (N=54). Students were asked to rate whether there had been sufficient opportunities for a diverse range of activities during clinical, production, and laboratory placements. They were also asked to comment on the benefits of the WBL programme and the challenges encountered when at real work placements. A thorough analysis of the survey findings identified several substantial factors affecting students' activities and opportunities, which were investigated in greater detail in four separate focus group discussion with students (N=7), graduates (N=6), faculty members (N=7) and placement providers (N=8) from diverse professions. Notable among the overall results was that students had adequate opportunities on most of the essential and fundamental practices (e.g. opportunities to observe, assist and directly handle clinical cases, communicate with the patient owners, learning diagnostic and treatment procedures in field level, etc.) resulting from the conscientious and unwavering endeavors of the students and sincere collaboration of the placement providers; although they did not have the opportunity to practice properly in some areas, such as pet animal

reproductive disease, post-mortem of pet and farm animals, and involvement in laboratory activities. In spite of the fact that the students were pleased with the conducive learning environment at most placements and the guidance and supervisions of the placement providers, some issues related to the time designated for certain placements. The top skills learned included diagnosis, communication and handling patients while more surgical experience was considered desirable. Apart from these, accommodation and travel were identified as the most challenging issues for the students.

The focus groups discussions were very constructive and helpful in identifying ways to make the WBL more efficient, productive and precise. In addition to emphasizing the need to select more potential workplaces at home and abroad, and ensure students have sufficient opportunities to practice all required skills, one of the priorities of the focus group discussions was to build effective, strong and long-lasting relations between the university and the placement providers.

Indeed, the profoundly compelling and effective outcomes obtained in this study will make the WBL of CVASU and other veterinary institutions in Bangladesh more constructive and dynamic, as well as create more opportunities for students to accumulate the knowledge, skills and aptitudes they need to properly prepare themselves before entering the professional career.

**Keywords:** Work-based learning, veterinary students, Opportunities, Challenges

# Chapter-1: Introduction

The concept of work-based learning (WBL) was described as early as the 18th century as 'teaching through work' (Olson, 2015) and has been developed as an educational strategy that allows students to learn through work, learn for work or learn at work (Lemanski et al., 2011). The integration of WBL in the academic curriculum aims to provide students with unrivaled learning opportunities in a typical working environment and prepare them for a multitude of career options (Börchers et al., 2010).

Work-based learning in the context of this Masters project refers to the activities undertaken by veterinary students away from the university with external placement providers, rather than clinical rotations in teaching veterinary hospitals or as part of a formalized distributed model curriculum. Veterinary WBL, externships or extramural studies (formerly known as 'seeing practice'), is not a new concept and has been an element of veterinary education in Canada since 1877 and in the UK since 1932 and has become part of the curriculum in many other veterinary schools around the world (Barker 1993; Bell et al., 2010). Work-based learning aims to boost the development of generic skills and the more specific skills and attributes essential for DVM graduates (Baguley 2006). Work-based learning also offers benefits for other stakeholders including employers, such as updated knowledge sharing with students and recruiting competent graduates (Samad and Islam, 2016).

Veterinary Schools in the European region (e.g. in the UK) usually assign the undergraduate students to private veterinary clinics, sometimes using a foster system with a base practice. Work-based learning is often sub-divided into a clinical and pre-clinical learning period (Charles, 2018), the latter focusing on animal handling skills and experience of various food production systems. Students have to work in private clinics and farms for a certain period where they engage in daily activities with the placement provider initially as an active observer and subsequently gaining supervised hands-on practical experience (Bell et al., 2010). Other placement options include government surveillance units, research laboratories, and referral practices. In partnership with private and corporate veterinary practices, some institutions in the United States provide WBL opportunities as externships and electives in ambulatory community service, shelter

medicine practices, a clerkship in different specialized veterinary clinics and organizations (e.g. Food and Drug Administration); and occasionally in laboratory and research institutes (Hedge et al., 2018; Fuentealba et al.; 2008, Bren, 2001). In South Asian countries, veterinary schools offer a diverse range of placements, including at government veterinary hospitals, private clinics, production farms, and research organizations (Hoque and Anwer, 2018).

In Bangladesh, 2 institutions, namely Chittagong and Sylhet Government Veterinary College (now, Chattogram Veterinary and Animal Sciences University and Sylhet Agricultural University) conceptualized and implemented an internship programme as part of the undergraduate DVM in 1995-96 and 2001-02, respectively. Over time, the programme has been continues to be strengthened in its structure, implementation, evaluation, and assessment system to align with the changing demands of the profession. Subsequently, the programme was adopted by all other veterinary schools in the country and currently, 11 veterinary schools offer internship programmes of 6-12 months duration. Three broad areas and activities are incorporated into the programmes: i) Clinical rotation, ii) Production rotation, and iii) Laboratory/ other rotation. Almost all schools run the clinical rotation at the Upazila Government Veterinary Hospitals and the Central Government Veterinary Hospital. Additionally, some schools also partner with private veterinary clinics and include overseas placements to provide clinical learning opportunities for the students. Private and government farms are commonly used for the production rotations e.g. dairy farms, poultry hatcheries, military farms, and Non-government Organizations. The Central Disease Investigation Laboratory and the Livestock Research Institute are common laboratory placements for students from all veterinary schools (Hoque and Anwer, 2018).

Veterinary WBL in Bangladesh does differ from western parts of the world and there are slight variations compared to neighboring countries. Veterinary schools in Bangladesh are unable to focus on private veterinary clinics for WBL placements as this sector is currently underdeveloped and cannot accommodate large numbers of students. The veterinary schools aim to provide exposure to more placements of short duration, instead of longer periods at fewer sites like in some other countries. In Bangladesh, faculty rather

than students are usually responsible for arranging placements, therefore, the scope for including elective rotations is minimal. However, there are other particularly valuable placements for Bangladeshi veterinary students, including military farms, live cattle markets, poultry processing plants, feed mills, NGOs, and public health institutes.

Although there are various benefits of WBL (such as practical experience, interpersonal skill development, gaining insight into the profession, etc.), many challenges are also encountered. These include identifying suitable placements, preparing students for WBL, managing every stakeholder's expectations and time, costs, and quality assurance (Magnier et al., 2014; Bell et al., 2010). Therefore, there is a need to address these challenges and make any required adjustments to the overall programme at CVASU and beyond in Bangladesh. However, there is no available published scientific study in this field. Our study was, therefore, the first scientific mixed methods (quantitative and qualitative) study supported by a grant from the Association of American Veterinary Medical Colleges (AAVMC)'s Council for International Veterinary Medical Education (CIVME) to synthesize information and generate new research that will enable educators across the region to optimize student learning on work-placements. Additionally, by providing useful and relevant information about running WBL programmes, this study has the potential to improve recruitment and retention across career options, manage expectations (students and placement providers) and improve accountability, monitoring, and quality assurance (for the university).

**The specific objective of the study is to:**

Evaluate a WBL programme in Bangladesh, specifically to identify benefits, challenges, options and stakeholder perspectives,

- By undertaking a study using a survey and focus groups to gather information from relevant stakeholder groups i.e. students, recent graduates, faculty and placement providers

# Chapter-2: Literature review

This chapter presents a coherent synthesis of previous research findings related to the Master's project "***Optimizing work-based learning in veterinary undergraduate studies by identifying factors and issues that contribute to the experiences of students, placement providers, and faculty***" by identifying and reviewing relevant existing literature. An objective was to collect the necessary data from previous studies in order to appreciate the existing knowledge and identify knowledge gaps and justify the present Master's research. The literature was found by searching PubMed, CAB Abstracts and Google Scholar for English language publications along with manual searching of journals and proceedings. This chapter includes a review of the literature on WBL and is organized into a series of sections that describe the purpose and objectives of WBL, global and national history, the evolution of veterinary WBL, and its current status in different parts of the world including Bangladesh. Additionally, the curriculum, operation, and evaluation of the WBL programme at Chattogram Veterinary and Animal Sciences University (CVASU) are described along with the potential benefits and challenges for key stakeholders.

## 2.1. Concept of work-based learning; purposes and objectives

The concept of work-based learning was incorporated into the academic curriculum to provide learners with real-life work experiences to facilitate the practical application of academic and technical skills and enhance future employability. Work-based learning is used in many disciplines and differs substantially from the framework of academic study and involves collaboration between the university and employers (Lester and Costley, 2010). One definition of WBL from Gray (2001) describes three key elements; i) learning through work, ii) learning for work, and iii) learning at work'. Work-based learning has both formal and informal aspects described by Eraut (2004), Lester and Costley (2010) and Attenborough et al. (2019). Eraut (2004) explained the informal part of WBL as implicit, unintended, opportunistic and unstructured, with the absence of a teacher compared to the more formal experience of being under the direct supervision of a mentor while at the work-placement. Lester and Costley (2010) also described that WBL has

some similarities to experiential learning and that it has often been quite opportunistic although there is an increasing trend to more structured approaches. WORK-BASED LEARNING is typically student-centered with hands-on work as the medium for learning but can also be more teacher-centered when, for example, employers deliver lectures (Williams and Thurairajah, 2009).

As there are many benefits to be gained from WBL, universities and academic institutions across the world have been incorporating more work-placements into the curriculum. Five fundamental purposes have been identified for WBL: i) acquiring employment-related knowledge or skill, ii) knowing the profession in the real world, iii) providing career exploration and planning, iv) gaining personal and social competencies and v) enhancing students' motivation and academic achievement (Katherin et al., 1999)

### 2.2. Global history of work-based learning

The concept of 'teaching through work' began in the 18$^{th}$century. In 1913 in the USA, at the Cooperative High School in Ohio students would spend part of their days in a workplace. Likewise, many other schools started apprenticeship programmes to support the wide range of employer needs (Olson, 2015). The School-to-Work Opportunities Act 1994 was implemented in the USA to provide all learners opportunities to participate in WBL (Lokken, 2012). In the UK, the sandwich courses (a higher education strategy since the 1950s) formally added certain work placement elements to the curriculum, such as industrial placements in undergraduate degrees in engineering and as part of technology courses (National Council for Technological Awards -NCTA, 1955). These types of placements are considered as WBL (Little et al., 1996). Work-based learning in medical education was described as the 'apprenticeship model' by Halsted (1904) where trainee students shadowed physicians for their clinical training (Spencer, 2003; Harden 2012).

### 2.3. History of work-based learning in the veterinary curriculum

Veterinary education officially began in 1761 after the foundation of the first veterinary school in Lyon, France by Claude Bourgelat (Cole, 2014). It has evolved with the changing times and will continue to do so to remain relevant to the profession and

society's needs (Larkin, 2012). According to Dr. Kochevar (2012), "The craft of veterinary education has changed immeasurably, such as outcomes assessment, tools of the trade, the learning environment, and even the students and educators themselves." Work-based learning was introduced in the veterinary curriculum in the 19th century and played a key role in allowing students to gain hands-on experience away from the university on placements with employers (Barker, 1993). The concept of WBL was introduced in UK veterinary education in 1932 and was known as 'seeing practice'. It is now mostly referred to as extramural studies (EMS) and is part of the Royal College of Veterinary Surgeon (RCVS) approval criteria for veterinary degrees in the UK. Over time, this workplace learning strategy was applauded by many veterinarians and even by other professional groups (Latham, 2001; Bell et al., 2010). In different regions of the world, WORK-BASED LEARNING is known by different names; extramural studies in UK and Ireland (Taylor et al., 1998; Doherty et al., 2006), extramural placement studies in Germany (Baljer et al., 2004), extramural practical work in Hungary (Solti, 2006), extramural placements in Australia (Baguley, 2006), preceptorships and externships in Canada (Barker, 1993). Different veterinary colleges in the USA provide WBL opportunities including farm animal and equine practice-based ambulatory programmes and other extramural clinical education programmes, typically with a primary care focus (Kopcha et al., 2005; Fuentealba et al., 2008). In Bangladesh, WBL is mostly known as an internship or externship, and is a formal part of the undergraduate DVM programme (Debnath, 2006).

### 2.3.1 Europe

The European Association of Establishments for Veterinary Education (EAEVE), the official accreditation authority for veterinary schools within Europe, includes External Practical Training (EPT), a form of WBL, as a compulsory activity for veterinary students. When working at an EPT placement, students must be supervised and are typically under the guidance of a non-academic person (e.g. a practitioner). External Practical Training cannot completely replace the on-campus academic training or off-campus training by faculty members, such as ambulatory clinics and herd health management training (ESEVT SOP, 2019). The veterinary schools in the UK assign their students to extramural

placements during the pre-clinical and clinical years of the curriculum at private clinics, sometimes for extended periods of time in a foster practice (Charles 2018). University Foundation for Veterinary Medicine Hanover, Germany integrated a practical year in the DVM curriculum in 2004-05, and the final year DVM students gain hands-on experience in a clinical setting or at a partner clinical institution (Börchers et al, 2010). In Ireland, at the Faculty of Veterinary Medicine, University College Dublin (UCD), DVM students are required to complete a minimum of 24 weeks of practical extramural study at different work placements during the third to fifth years of the course (Doherty and Jones, 2006). At the Faculty of Veterinary Science, Szent Istvan University in Hungary, DVM students are required to do extramural clinical diagnostic work as part of their 720 hours of practical training (Solti, 2006).

### 2.3.2. North America

The Council of Education of American Veterinary Medical Association (AVMA), the accrediting body for schools and programmes that offer the professional DVM degree in the USA and Canada, has clearly stated guidelines about off-campus clinical education and the distributive veterinary clinical education model. Some veterinary schools in North America include distributive clinical activities in off-campus sites such as private practices, field services, practice-based ambulatory programmes, herd health, and herd production medicine programmes (Kopchaet al., 2005, Fuentealba et al., 2008, Accreditation Policies and Procedures of the AVMA COE 2019).

The College of Veterinary Medicine, Western University of Health Sciences, USA provides WBL opportunities through a Veterinary Ambulatory Community Service (VACS) and an off-campus shelter medicine externship, private and corporate veterinary practices, educational and research institutions, laboratories and organizations (such as at a zoo) (Fuentealba et al., 2008, Hedge et al., 2018). Practice-based Ambulatory Program (PBAP) is offered as two, three-week clerkships in equine or food animal practices by the College of Veterinary Medicine at Michigan State University (Kopcha et al., 2005). At the University of Calgary Faculty of Veterinary Medicine (UCVM) in Canada, the final year follows a distributed model with students based for two to four weeks on extramural

rotations such as food-animal health (including swine, poultry, dairy cattle, and beef cattle), equine health, canine and feline practice, mixed-animal practice in a rural community, exotic-animal practice (including avian, reptile, and other caged companion animals), zoo-animal health, and public health(Hashizumeet al., 2016).

### 2.3.3. Australasia

Extramural study or WORK-BASED LEARNING is an integral and structured part of the education and training of veterinary students in Australasia. Veterinary schools provide WBL opportunities and expect students to actively participate in the work-up, management, and treatment of patients (Accreditation Standards, AVBC 2016). Veterinary schools in Australia offer core and elective EMS placements to veterinary students in their final year. Students at the Faculty of Veterinary Science, University of Sydney perform extramural activities in core placements including small animal, rural mixed practice, and rural public practice. They also undertake WBL in the livestock industry to learn, for example, about herd health management, and veterinary public health placements (Baguley 2006). Between 3$^{rd}$ and 5$^{th}$ year, DVM students at Murdoch University have to complete 12 weeks of elective extramural clinical work in any one of the following areas; advanced topics in equine practice, mixed animal practice, wildlife, zoological and conservation medicine, small animal practice, or in production animal practice. Ten-weeks of dedicated extramural placements is offered by the University of Queensland, which involves a broad cross-section of experience in a mixture of small animal clinics, livestock clinics (rural practice), or a mixture of companion and farm animal experience. External rotations are undertaken by students at the University of Melbourne in the areas of veterinary public health, dairy cattle medicine and surgery, and shelter medicine and surgery (van Gelderen, 2014). The School of Veterinary Science, Massey University in New Zealand arranges different extramural placements for DVM students. In the 1$^{st}$ and 2$^{nd}$ years, students work in extramural farm placements and in the 3$^{rd}$ and 4$^{th}$ year at extramural clinical placements. During the lecture-free clinical final year, students also have opportunities to work at a range of extramural clinical rotations (Parkinson et al., 2017).

### 2.3.4. Africa

Different veterinary schools in Africa provide WBL opportunities to DVM students in different ways. The Faculty of Veterinary Science at the University of Pretoria arranges both core and elective placements for students in the final year. Of the 42 weeks of core practice, 11 weeks are dedicated to four off-campus rotations such as production animal ambulatory, state veterinary core practice, community engagement clinics, and private practice (Irons et al., 2017). Another example is the externship programme within the DVM curriculum at the Faculty of Veterinary Medicine in Addis Ababa University (AAU), which is worth of 17 credits. During the externship, students may undertake farm animal, field, abattoir and laboratory experience. Afterwards, students are assigned to various veterinary establishments around the country (Mayen 2006).

### 2.3.5. Asia

Work-based learning in Indian veterinary schools is made compulsory by the Veterinary Council of India and they operate this programme mostly using Government-owned facilities (Debnath, 2006; Veterinary Council of India, 1993). Work-based learning is described as Veterinary Clinical Practice which begins from the 3$^{rd}$ year of the DVM curriculum. Thirty-six veterinary colleges across India maintain clinical rotations in both veterinary science (veterinary hospitals) and animal husbandry (livestock farms) (Rahman 2004). The Veterinary Council of India implemented a 1 year-long compulsory WBL programme for DVM students from 2016-17. Khon Kaen University, Thailand has a 6-year DVM programme with a one-year clinical rotation on different specialized areas. In the last three months of the final year, students undertake a project at an off-campus workplace of their choice for example, at a veterinary clinic, drug company, farm or laboratory under the supervision of a registered veterinarian. Some students undertake the project abroad, e.g. in Canada, Japan and Malaysia (Hoque and Anwer, 2018, Dean of Veterinary Science, KKU, Personal communication 2020). Since 2019, the Faculty of Veterinary and Animal Science of University of Peradeniya (UP) in Sri Lanka added an externship (2-week compulsory roster, 2-week elective roster) within the 6 months of clinical rotations (Hoque and Anwer, 2018). In Bangladesh, WBL in veterinary education was first initiated by Chittagong Government Veterinary College in 1994-95 and is now

an integral part of the veterinary curriculum in all veterinary schools in Bangladesh (Debnath, 2006).

### 2.4. Veterinary work-based learning in Bangladesh

Over time, the DVM undergraduate internship or work-based learning (WBL) programme has been strengthened in its structure, implementation, evaluation and assessment system to keep up with the changing demands of the profession (Hoque and Anwer, 2018). All of the 11 veterinary schools run internship programmes in the final year, when students spend an extended period ranging from 6 to 12 months at extramural placements (Samad and Islam, 2016; Hoque and Anwer, 2018). The whole programme is structured and conducted either only in Bangladesh or in Bangladesh, India, Thailand and Malaysia. At Bangladesh Agricultural University (BAU), the WBL concept was introduced in 2004 and consists of a six-month internship programme for DVM students in the final year at more than 10 training centers in Bangladesh and India (Samad et al., 2015). Since 2001, one-year long internship programme has been in operation at Sylhet Agricultural University (SAU) and its students are being offered WBL opportunities in various institutions across the country. Over the past few years, students here have also been getting the internship opportunity for a month in two veterinary institutions in India. Chattogram Veterinary and Animal Sciences University has sent all of the DVM final year students to Tamil Nadu Veterinary and Animal Sciences University (TANUVAS), India since the internship programme began in 2001. Bangladesh Agricultural University started sending its students to TANUVAS, India in 2015. Additionally, CVASU has had a student exchange programme with a few renowned veterinary schools in the USA, Malaysia and Thailand. (Prof Md. Ahasanul Hoque, OIE Twinning Project, Personal communication).

Three broad areas of activities are incorporated into the internship programme: clinical, production, and laboratory rotations. All veterinary schools except one send their students to Upazilla Government Veterinary Hospitals and Central Government Veterinary Hospital. Only one school arranges rotations at a private practice. Irrespective of the veterinary school, students have the opportunity to work at different government and private dairy and poultry farms, breeder farms and hatcheries. Common laboratory

rotations are at the Central Disease Investigation Laboratory, Bangladesh Livestock Research Institute, and pharmaceutical industries. Placements at Public Health institutes like the Institute of Epidemiology Disease Control Research are offered by a few schools (Hoque and Anwer, 2018).

### 2.4.1. Curriculum, operation, and evaluation of the Work-Based Learning programme at Chattogram Veterinary and Animal Sciences University

Chattogram Veterinary and Animal Sciences University offers a 12-month long internship programme of which 3-4 months is on-campus rotations, including laboratory rotations and placements at the Epidemiology unit, the Teaching Veterinary Hospital (TVH) and the Teaching and Training Pet Hospital and Research Center (TTPHRC). The remainder of the internship is at different workplaces (off-campus) at home and abroad. The clinical rotations in Bangladesh include Upazilla Veterinary Hospital (UVH), Central Veterinary Hospital (CVH), National and regional Zoos, Remount Veterinary and Farm Depo (Military Dog Squad) of Bangladesh Army and live cattle markets. Students are assigned certain activities to perform during the Upazilla Veterinary Hospital rotation, such as a farmer training programme, vaccination camps, school kid programme, etc. All students are fortunate to also have an opportunity to work as an intern doctor for up to 6 weeks at the Veterinary Research and Training Institute (VC&RI), Namakkal and Madras Veterinary College (MVC), Chennai which is part of Tamil Nadu Veterinary and Animal Sciences University (TANUVAS), India. CVASU also started a collaborative student exchange programme with the aforementioned overseas veterinary schools. Under a Memorandum of Understanding with Tufts Cumming School of Veterinary Medicine (TCSVM), USA, University Putra Malaysia (UPM), Malaysia and Khon Kaen University (KKU), Thailand CVASU sent a group of selected students to these placements and also received students from these institutes for the CVASU WBL programme since 2015 **(Table 2.1).**

The production rotation consists of placements at Government and private dairy farms, poultry farms, breeder farms, and Remount Veterinary and Farm Corps (Military dairy farms) of the Bangladesh Army. Students also have an opportunity to work in different laboratory placement for example, the Bangladesh Livestock Research Institute (BLRI),

Central Disease Investigation Laboratory (CDIL), Central Cattle Breeding and Dairy Farm (CCBDF) and pharmaceutical industries **(Table 2.1).**

**Table 2.1.** Chattogram Veterinary and Animal Sciences University (CVASU) final year placements

| Name of placement | Duration (weeks) | Description |
|---|---|---|
| ***On-campus placements*** | ***8*** | |
| 1) Teaching Veterinary Hospital (TVH), CVASU | 2 | 3 days in each of the medicine, surgery, theriogenology and epidemiology units. All species cases seen at the hospital. |
| 2) Laboratory rotation, CVASU | 4 | 3 days in each laboratory: Anatomy and histology, Animal science and nutrition, Poultry & dairy production, Microbiology and veterinary public health, Pathology and parasitology, Physiology, pharmacology and biochemistry, Genetics and animal breeding, Poultry research and training center. Learn and practice laboratory skills. |
| 3) Teaching and Training Pet Hospital and Research Centre, Dhaka | 2 | Small animal clinic in capital city. Owned and run by CVASU; primarily dogs, cats and pet birds. |
| ***Off-campus placements*** | ***27-32*** | |
| ***Clinical placements*** | ***17*** | |
| 4) Upazila Veterinary Hospitals | 8 | Government run regional clinics. Students attend their local UVH. All species seen. |
| 5) Central Veterinary Hospital | 1 | Government run clinic in the capital, Dhaka. All species seen, mostly pet animals. |
| 6) Zoos (national and regional) | 1 | National Zoo in Dhaka and Chattogram Zoo |
| 7) Remount Veterinary and Farm Depo | 1 | Dog and horse squad of Bangladesh Army |
| 8) Live animal market | 1 | During Eid-Ul-Adha festival |
| 9) Other placements | 1 | One or more of: Quarantine station in Chattogram port, slaughterhouse, local drug store, food processing plant |
| 10) Tamil Nadu Veterinary and Animal Sciences University (TANUVAS), India | | Overseas placement for all students |
| a. Veterinary Research and Training Institute (VC&RI) | 2 | Mostly farm animals plus, laboratories and a processing plant |
| b. Madras Veterinary College (MVC) | 2 | Mostly pet animals |

| | | |
|---|---|---|
| ***Farm placements*** | ***5-7*** | |
| 11) Private dairy farms | 1-2 | One day at 5-10 small commercial dairy farms in Chattogram region |
| 12) Remount Veterinary and Farm Corps | 2-3 | Bangladesh Army dairy farms in Dhaka and Chattogram |
| 13) Central Cattle Breeding and Dairy Farm | 1 | Government run cattle breeding farm, Dhaka |
| 14) Regional poultry farm | 1 | Government run poultry farm, Chattogram |
| ***Laboratory placements*** | ***3*** | |
| 15) Central Disease Investigation Laboratory | 1 | Government run disease investigation laboratory for animals and birds in Dhaka |
| 16) Livestock Research Institute | 1 | Government run laboratory mainly works on vaccines |
| 17) Bangladesh Livestock Research Institute | 1 | Research institute, Ministry of Fisheries and Livestock |
| 18) Pharmaceutical industry | 1-2 day | Occasional placement, visit to a pharmaceutical plant |
| ***Selective placements*** | ***2-5*** | |
| 20) Tufts Cummings School of Veterinary Medicine, USA | 4 | Available to 4 students, clinical placement, mostly pet animals |
| 21) Khon Kaen University, Thailand | 2-4 | 10-12 students, clinical placement, mostly pet animals |
| 22) University Putra Malaysia | 2-4 | 10-12 students, clinical placement, mostly pet animals |
| 23) Poultry breeder farm and hatchery | 1 | Occasional placement for group of students |
| 24) Self-choice option | 2-4 | Students can arrange any national or overseas placement |

The whole WBL programme is coordinated and monitored by the Director of External Affairs CVASU. The director arranges all of the work-placements and maintains communication with placement providers. He assesses the feedback reports on the performance of each student from the placement providers, checks the logbook, arranges feedback meetings with students, and administers a survey of the students usually after each rotation (Hoque and Anwer, 2018).

Students have to maintain a structured logbook containing aims, objectives and assigned activities for each placement. They have to list all of the completed tasks at the placements as well as any tasks that were not undertaken. After completion of each placement, the

placement providers mark the students with a grade (A-D) based on their attendance, the list of activities they conducted and their overall performances, and also put comments on their progress in the logbook. As well as being checked by the internship coordinator, the logbook is reviewed by each member of the board of examiners (Hoque and Anwer, 2018)

During the internship programme students are also required to write two scientific reports (clinical and production) and CVASU provides structured guidelines for the preparation and evaluation of the reports. There are two mid-term internship examinations followed by a final examination. Students also have to take an Objective Structured Clinical Examination (OSCE), give an oral presentation and attend a viva (Hoque and Anwer, 2018).

### 2.5. Analytical comparisons of work-based learning between overseas and Bangladesh

In Bangladesh, veterinary schools aim to provide DVM students with exposure to a diverse range of workplaces through placements of relatively short duration rather than a period at fewer placements as in some other countries. The placements are mainly arranged by a faculty member (Director of External Affairs), whereas in some countries, including in the UK, students are responsible for arranging placements themselves (Bell et al., 2010, Hoque and Anwer, 2018). Veterinary work-based learning in the European region is mostly focused on private veterinary clinics (Bell et al.,2010) but private veterinary practices in Bangladesh are not currently able to take large numbers of DVM students for WBL (Debnath, 2006). All veterinary schools in Bangladesh send students to UVH and CVH where they have opportunities to work with a number of clinical cases (Hoque and Anwer, 2018). Foster practices and shelter medicine centers are used for WBL placement by some schools in the UK and the USA (Charles 2018, Hedge et al., 2018) but this is not an option in Bangladesh. Veterinary ambulatory services are an important placement type in veterinary schools in the USA (Kopcha et al., 2005, Hedge et al., 2018), although this type of placements is not common in Bangladesh. Almost all DVM students in Bangladesh have an opportunity to work on wild animal clinical cases at central and local zoos, which is only available in some overseas veterinary schools for example, in the

USA and Australia (Fuentealba et al 2008). Bangladeshi students are also fortunate to undertake rotations at RV & FC (Dairy Farm, Bangladesh Army) and RV & F Depo (Dog and horse squad, Bangladesh Army). Other short but valuable placements are available to students in Bangladesh at non-governmental organizations (NGOs), live cattle markets, slaughterhouses, cattle breeding centers, feed mills, and meat processing plants and these are rarely considered for work placements by other veterinary schools around the world (Hoque and Anwer, 2018).

### 2.6. Benefits of work-based learning

#### 2.6.1. Benefits for students

Multiple studies have indicated that the workplace provides a valuable environment for student learning (Eraut et al. and 2000, Felstead et al., 2005). The hands-on nature of workplace activities enables students to develop technical skills and professional behaviors more effectively than in the classroom. The prospects of future employment opportunities are an additional benefit as employer's value workplace experience and skills. Other benefits for students including individual proficiencies (communication, teamwork, and client relations skills), general skills (problem-solving abilities) and qualities such as being highly motivated and prepared to take risks (European Training Foundation, 2013).

Researchers in veterinary education have described several advantages of WBL for students. Work-based learning helps students develop invaluable clinical, practical, personal, and professional skills, builds up confidence and provides a greater awareness of the profession, career choices and employment opportunities (Debnath, 2006; Marr, 2016; Charles, 2018; Hedge, 2018; Hoque and Anwer, 2018; Loeb 2018). Students also learn about time management, practice management, working with clients and with members of the practice team, leadership, and the economics of practice in a real workplace (Smith 2003). Additionally, by creating a link between theory and practice, WBL allows students to gain hands-on experience that will ease the transition between highly structured academic studies and their professional veterinary careers (Hannover, 2009). RCVS has stated that Day-One-Competences, required of all graduates, can be developed while

students are on EMS or work-placements. Undertaking work placements with other professions can expand veterinary students' knowledge of One Health through for example, integrative learning in the community and collaboration with public health experts (Tyner et al., 2014). Lloyd (2007) showed that interaction with people from different places, professions and cultures while on placements also helps students develop certain non-technical skills, knowledge, aptitudes and attitudes.

### 2.6.2. Benefits for faculty or University

Work-based learning programmes create an effective and beneficial connection between universities and industries (Samad and Islam, 2016). It may highlight key employability skills which the DVM graduates need to possess to compete in the job market. Additionally, when changes in veterinary practice are encountered during WBL (such as new clinical cases, diseases, techniques) these can inform revisions of the curriculum and approaches to teaching.

### 2.6.3. Benefits for placement providers

Some researchers have found potential benefits for placement providers and employers as a result of students being at their workplaces. Anderson (2005) described benefits for employers as a result of the collaboration with universities that included improving future workforce performance and preparing better quality recruits. Employers have opportunities to familiarize themselves with potential future employees and can promote their businesses to students (Berger and Pilz, 2009; Wenzelmann et al., 2009). Latham (2001) defines a list of potential benefits to encourage veterinary practitioners to engage in WBL, such as personal satisfaction from helping enhance student skills and confidence, training potential future colleagues and the possibility of recruiting future employees. He also noted that through discussions with students, practitioners have opportunities to update themselves on newly developed ideas and technologies from universities – a win-win situation and a valuable way to mitigate the skill gaps among practitioners.

## 2.7. Challenges of work-based learning

Educators around the world have identified different challenges associated with implementing WBL. Arranging good veterinary work placements with a favorable learning environment for an increasing number of students is one of the major challenges (Bell et al., 2010, Charles, 2018, Hoque and Anwer, 2018). Variations in exposure to clinical cases and access to different resources at different placements may result in inequalities in the learning opportunities for students (Scholz et al., 2013). Attitudes and the willingness of placement providers and associated staff to teach and supervise students during WBL can have a considerable effect on the quality of the learning experience (Charles, 2018; Scholz et al., 2013). Students want as much hands-on experiences as possible during placements. However, WORK-BASED LEARNING adds to the veterinarian's workload when there is an increasing time and resource pressure in practice and some are therefore reluctant to take students (Loeb, 2018; Mahoney et al., 2011). Scholz et al. (2013) has warned that students sometimes encounter unusual approaches and hear unreliable clinical information from some practitioners which may cause confusion. For students, off-campus WBL placements can create significant stress in the areas of finance, accommodation, adapting to the pace of the clinical workplace, balancing personal commitments and potential isolation (Baguley, 2016). Hoque and Anwer (2018) found some important challenges in Bangladesh, including managing suitable national and international placements for a large number of students, arranging accommodation at different placements and insufficient funds.

## 2.8. Significance of the present study

Work-based learning is an important part of undergraduate education for many professional disciplines, including veterinary medicine. Although WBL has been part of the DVM programme in Bangladesh for quite a long time, only sporadic unstructured studies have been conducted in this country to date. As a result, the usefulness and/or practicality of the WBL programme in helping to prepare future skilled veterinarians has not been fully explored with the key stakeholder groups including students, faculty and placement providers. Hence, this study aims to identify the range of options, benefits,

challenges and related stakeholder perspectives regarding WBL by conducting a survey on students and focus group discussions with representatives of each stakeholder group. Subsequently, it will identify the ways to optimize and maximize the benefits while managing the variety of challenges in delivering WBL as part of a veterinary programme. The research findings will enable educators to optimize student learning on work-placements. Additionally, by providing useful and relevant information about running WBL programmes, this project has the potential to improve recruitment and retention across the range of career options, manage expectations (students and placement providers) and improve accountability, monitoring and quality assurance (for the university). Based on the foregoing, it is anticipated that this study will make a major contribution to creating an improved WBL programme in Bangladesh.

### 2.9. Summary

The chapter has reviewed the concept of WBL in a variety of contexts including veterinary education and described the current situation of WBL in different countries around the world as well as specific details of the internship programme at CVASU, Bangladesh. The above discussion argues that educators need to focus on all aspects of WBL (CVASU's internship programme), ensure efficient delivery and provide a conducive learning environment for students with the aim of introducing them to a real-life working environment before the end of their studies. Very few studies have been undertaken on WBL in Bangladesh to date and many important factors related to WBL have not been identified and analyzed. Therefore, the present study on ***"Optimizing work-based learning in veterinary undergraduate studies by identifying factors and issues that contribute to the experiences of students, placement providers, and faculty"*** will increase the insight into WBL in Bangladesh and the findings are likely to serve as a foundation for future researchers.

# Chapter-3: Materials and Methods

## 3.1. Survey design

All students (N=62, 19th batch, session 2013-14) who had completed an undergraduate 1-year veterinary internship programme in the academic session of 2018-19 of Chattogram Veterinary and Animal Sciences University (CVASU), Bangladesh were surveyed in August 2019. The survey was prepared in Google form using multiple-choice grid options for Likert scale items and free text questions. The survey was administered online.

### 3.1.1. Description of the questionnaire

6-point Likert scale (strongly agree, agree, neutral, disagree, strongly disagree and didn't do) questions were used to examine the students' degree of agreement with the statements about their experiences and opportunities when undertaking activities at different work placements (at UVH, TANUVAS, dairy and poultry farm placements, RV & FC, CVH, BLRI, CDL and CCBDF). There were 139 questions under five primary sections and 18 sub-sections including one open text free question for each of the subsections where students could comment on the corresponding Likert questions **(Table 3.1, Appendix-I)**. These questions were set based on 'Day 1 competencies' of veterinary education core curriculum (OIE Guidelines) and DVM syllabus curriculum of CVASU with consideration for local context i.e. procedures normally performed and tests available in veterinary practices in Bangladesh. A brief outline of the questionnaire is given in the box below. The questionnaire was thoroughly peer-reviewed and administered to a few (3) volunteer students in order to identify any gaps and mistakes. Accordingly, the questionnaire was finalized. The students participated in pilot testing was not included in the main study.

**Table 3.1.** Survey Questionnaire

**Section-1**: Demographic information of the participants

**Section-2**: Opportunities to observe, assist and directly handle food and pet animal clinical cases at different work-based placements availability of enough clinical cases.

**Section-3**: Opportunities to perform certain practices and develop several skills by working at different clinical and production placements

3.1 Communication with owners
3.2 Clinical examination of food animals
3.3 Clinical examination of pet animals
3.4 Collection of diagnostic specimens from food animals
3.5 Collection of diagnostic specimens from pet animals
3.6 Drug administration through a different route in food animals
3.7 Drug administration through a different route in pet animals
3.8 Perform different diagnostic tests in laboratories
3.9 Perform postmortem of different species
3.10 Assist with common clinical, surgical and reproductive cases of food animals
3.11 Assist with common clinical, surgical and reproductive cases of pet animals
3.12 Writing drug prescriptions for different species
3.13 Collection of epidemiological data
3.14 Writing death/ health/ soundness certificate
3.15 Plan and execute vaccination and deworming program
3.16 Other activities, like farm visit, prepare farm planning, balanced ration, and diet chart, attending the farmers training program and school kid programme

**Section-4**: About internship coordinator, placements and placement providers

4.1. Appropriateness of the time allocation
4.2. Structure of the logbook
4.3. Activities of internship coordinator prior to sending interns to placements
4.4. Learning environment at placements, cooperation from placement providers and associated staff and the monetary incentive for placement providers
4.5. Challenges for interns
4.6. Qualities (confidence, skill, and professionalisms) improved in interns
4.7. Awareness of veterinary career

**Section-5**: Opinions

5.1. Top skills learned, missed and desired skills, best aspects of work-based placements and Job offer from placement provider

### 3.1.2. Administration of survey questionnaire

The survey was administered to all interns as part of the feedback CVASU gathered on the internship programme. Before administering the survey, the objectives and intended outcomes of the study were described and students were informed that their responses would be anonymous.

## 3.2. Focus group discussion

### 3.2.1. Focus group discussion participants

To explore the survey findings in more depth and discuss experiences of WBL (such as perceptions, attitudes and beliefs about WBL) with relevant stakeholders, four focus group discussion (FGD) sessions were arranged at CVASU with four different groups of stakeholders: i) learners (*Interns*), ii) recent graduates, iii) faculty and iv) placement providers (**Table 3.2)**.

**Table 3.2.** Focus group discussion schedule and composition

| FGD session | Date, 2019-20 | Stakeholders | Comp-osition | Participants | Purposes |
|---|---|---|---|---|---|
| 01 | 31 Oct | DVM interns (Session: 2013-14) | 4 males and 3 females | Students with variable CGPA and different gender | To gather students' insight into work-based placements, available opportunities, challenges and possible remedies |
| 02 | 25 Nov | Recent DVM graduate (Session: 2012-13) | 4 males and 2 females | Graduates with variable CGPA, different fields of post-graduate studies and different genders | To explore the views of graduates on different aspects of WBL and aftermaths in higher studies and professional sectors |
| 03 | 23 Dec | CVASU faculty | 5 males and 2 females | Dean (Faculty of Veterinary Medicine),<br>Director (External affairs cum internship program coordinator),<br>Director (Teaching Veterinary | To analyze the learning environment and opportunities in different work-based placements and find out about working |

| | | | | | |
|---|---|---|---|---|---|
| | | | | Hospital) and<br>Faculty members (Animal Nutrition, Poultry Science, Theriogenology and Livestock Marketing) | strategies of responsible bodies in CVASU |
| 04 | 1 Feb 2020 | Placement providers | 7 males and 1 female | Upazilla Livestock officer (2), Veterinary surgeon (1), Curator of Bangladesh National Zoo (1), Private pet practitioner (1), Technical manager of poultry breeder farm (1), Major of Bangladesh army from Military Dairy Farm (1) and Dairy farmer (1) | To mark out the real scenarios of different workplaces for students and identify expectations of placement providers |

### 3.2.2. Focus group discussion guide

A discussion guide, with six primary sections, was prepared according to the findings of the earlier survey. **(Table 3.3, Appendix-II)**. Questions in the guide were common for each session except for the stakeholder specific questions which were set based on career stage, position, and experiences of the stakeholders (for example, benefits and challenges for each stakeholder group, prospects of job opportunities for students in different sectors).

**Table 3.3.** Focus group discussion guide

| |
|---|
| **Section-1** (Introductory question): Benefits/advantages of work-based placements |
| **Section-2** (Transition questions): Opportunities to get involved with the cases generally |
| **Section-3** (Specific skills questions): Opportunities to get involved with the specific skills (practices were missed by interns in work-based placements) |
| **Section-4** (Composition and challenges of internship): Time duration at placements and challenges for interns and placement providers |
| **Section-5** (Stakeholder specific questions): Different questions for each stakeholder to explore some facts from their point of view |
| **Section-6** (Ending question) |

### 3.2.3. Operational procedure of focus group discussion

Each discussion session lasted for two hours which was guided by a moderator using the FGD guide. At the start of each session, the objectives and activities of the project were

explained briefly. Participants were informed that their contributions would remain anonymous. Afterwards, all the participants signed a consent form agreeing to participate in the study. The discussions were recorded in a hand notebook (by a note-taker) and by an audio recorder.

### 3.2.4. Transcription of focus group discussion

Using both the recorded audio and notes in the notebook, whole conversations of the discussion sessions were transcribed and translated from Bengali to English by a third person who was not present in the FGD session.

## 3.3. Data entry and evaluation

### 3.3.1. Survey data

The survey data from the completed Google form were transferred to MS Excel 2019. Subsequently, the data were sorted, cleaned and checked for any missing. Each of the Likert responses was coded and assigned with a point value e.g. didn't do this=0, strongly disagree=1, disagree=2, neutral=3, agree=4 and strongly agree=5. The total score of each of the questions was calculated by adding the point values of every respondent for further analysis.

STATA-IC-13 (Statacorp, 4905, Lakeview, College station, Texas, USA) was used to analyze the Likert scale responses. Mean and median values were calculated as a measure of central tendency for all questions. The quantitative survey responses were not normally distributed and non-parametric Mann-Whitney U test was conducted to assess the difference of score/rank of opportunities of different activities between food animals and pet animals; and between male and female students. Statistical significance was set at $p < 0.05$. The data were graphically visualized in the Divergent bar chart by using MS Excel 2019.

Responses to some of the free text questions, for example the top three desired skills by students at different placements, were displayed as a word-cloud for text analysis (WordArt.com) to enable visualization of the response frequencies. Other free text questions analyzed to identify recurring themes, similarities and differences.

### 3.3.2. Focus Group Discussion data

Transcripts of FGD sessions were reviewed and coded in Microsoft word 2019 by indicating variables according to the listed questions (similarities, differences and most frequent responses). Some examples are given as supplementary materials or Appendix-II. The finalized data were analyzed using inductive thematic analysis to identify and report the response patterns of stakeholders. One focus group was analyzed by two skilled persons independently and emerging themes were discussed with slight modifications made until consensus was reached. The remaining focus group transcripts were analyzed by the single person in the team.

### 3.4. Ethical consideration

The study was approved by the Chattogram Veterinary and Animal Sciences University Ethics Committee [permit ref. no. CVASU/For (R&E)EC/2019/39(2/9)Date: 15.5.2019] Bangladesh.

# Chapter 4: Results

## 4.1. Survey participant demography

Among 62 final year DVM students enrolled for the academic year 2018-19 in Chattogram Veterinary and Animal Sciences University, 54 students responded to the Google form based online survey, representing a response rate of 87%. The eight non-participating students distributed as following; two were sick, one had a family emergency and five refused to participate without mentioning any reason. All of the respondents had completed their externship at several workplaces nationally and internationally.

### 4.1.1. Students' opportunities for pet and farm animal practice

Students were asked to indicate their level of agreement on 6-point Likert scale (Strongly agree, agree, neutral, disagree, strongly disagree and didn't do this) about the opportunities to 'observe' and 'assist with' clinical cases and 'directly handle animals and perform procedures' **(Figure 4.1, Appendix-III)**. Nearly all respondents had sufficient opportunities to observe clinical cases of both farm animals (96% agreed or strongly agreed) and pet animals (98% agreed or strongly agreed) and most were able to assist with clinical cases (farm animal 87% agreed or strongly agreed, pet animal 87% agreed or strongly agreed). However, there were relatively fewer opportunities to directly handle clinical cases and perform procedures (65% agreed or strongly agreed for farm animal, 76% for pet animals). Students entered free text comments (39 related to farm animals, 32 related to pet animals) and mentioned a variety of reasons that explained why their experiences and opportunities varied. Reasons that prevented them becoming directly involved with clinical cases related to caseload, cooperation from placement providers, duration of placements and technical facilities available at placements.

> *"[Placement X] had significant amount of cases. Whereas at [Placement Y] and [Placement Z] there were very few amounts of cases"*
>
> *"Got a chance to observe but no opportunity to direct diagnosis because not permitted by placement providers".*

Student responses demonstrated that there were enough opportunities to communicate with farm animal owners (83% agreed or strongly agreed) and pet animal owners (89%

agreed or strongly agreed). Most of the students (more than 80%) agreed or strongly agreed that there were sufficient opportunities to perform basic clinical skills on farm and pet animals including recording temperature, heart rate, pulse rate, auscultation, assessing hydration status, palpation and pregnancy diagnosis and to administer drugs by different routes (sub-cutaneous, intra-venous and intramuscular injections). In the free-text comments (28 related to farm animal, 22 related to pet animal) students identified the support of both placement providers and owners had been important in enabling them to gain experience, for example:

> "*All the placement providers were very cordial and gave us opportunity to observe and take basic parameters of animals. Owners were also very cooperative"*

Students indicated that there were sufficient opportunities to collect and process blood sample (89% and 93% agreed or strongly agreed for farm and pet animal, respectively), skin scrapings (72% and 85% agreed or strongly agreed for farm and pet animal, respectively) and rumen fluid samples (69% for agreed or strongly agreed for farm animal) for diagnostic purpose. However, opportunities to collect, process and preserve post mortem specimens were reported as very low (only 20% and 17% agreed or strongly agreed for farm and pet animal, respectively).

Although, 61% of the students had opportunities to perform local anesthesia in farm animals, less than half of them were agreed or strongly agreed they had sufficient opportunities to perform local anesthesia (46%) and general anesthesia (43%) on pet animals. Fifteen students commented and described some of the reasons including not being allowed to assist and a shortage of equipment at some placements.

> *"In any surgical case, anesthesia was done by doctors. We only observed the procedures"*
>
> *"[*placement *X] has less logistic support to perform general anesthesia in pet animal"*

When comparing the Likert scale data for certain activities between farm animals and pet animals **(Figure 4.1)**, 4 of 24 comparisons showed significant differences ($p \leq 0.05$). When asked about the number of clinical cases at placements being enough for learning, students

had significantly more opportunities with pet animals compared to farm animals (p=0.008). Additionally, opportunities to assess lung and heart sound, and to collect and process a skin scraping were significantly more in pet animals than farm animals (p=0.02 and p=0.05, respectively). Students had significantly less opportunity to assist with common reproductive cases of pet animals in comparison to farm animals (p=0.006). From the student comments, the main reasons were identified as lower caseloads and lack of diagnostic tools (e.g. ultrasonography machine) at some of the placements.

> *"I had less opportunity to attend reproductive cases of pet animals like spaying, castration, cesarean operation in [*placement *X]. No opportunities at [*placement *Y] and [*placement *Z]"*

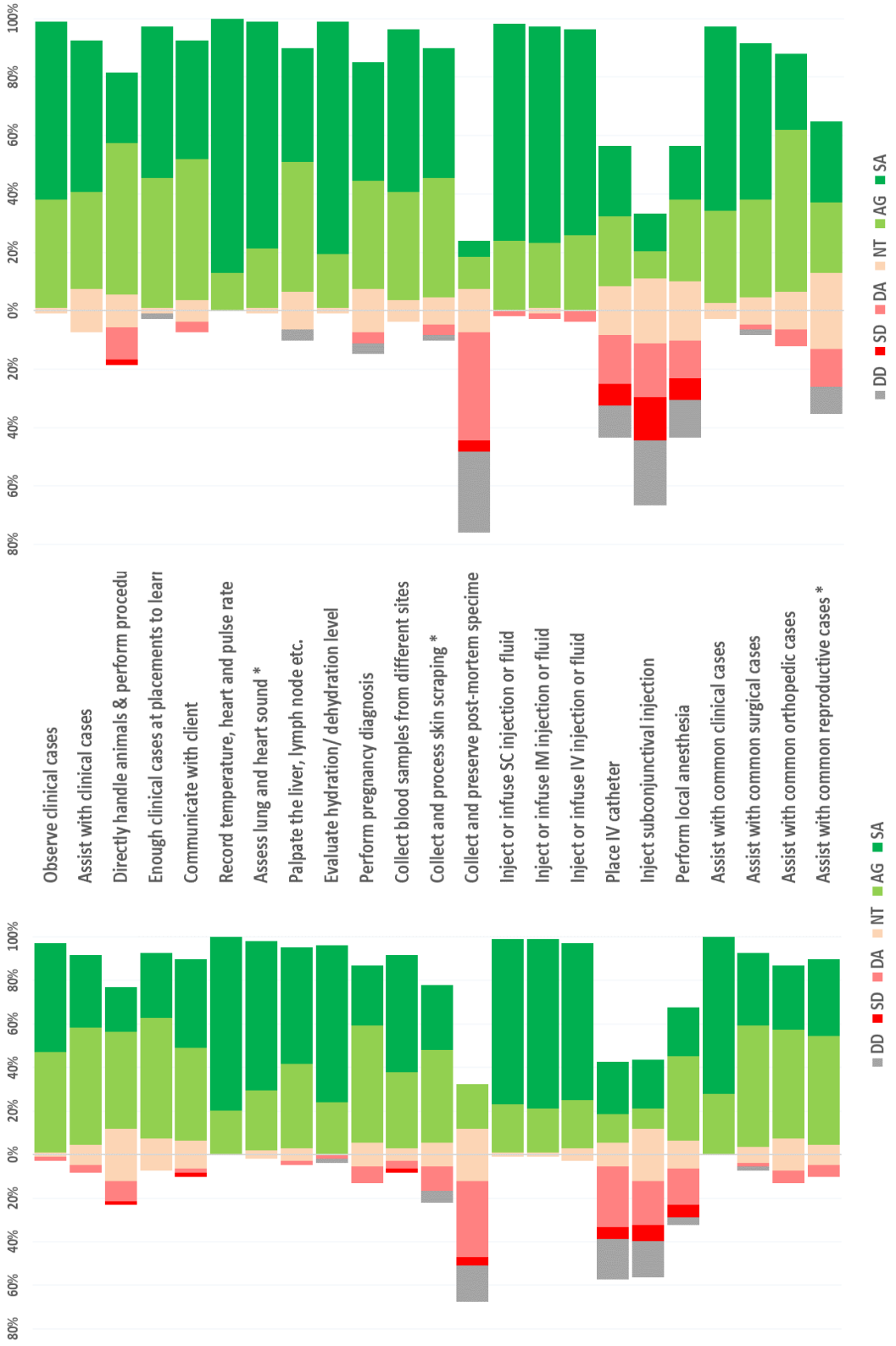


**Figure 4.1.** Students' responses on pet and farm animal (* $p \leq 0.05$)

### 4.1.2. Students' opportunities for different laboratory work and post-mortem:

The diagnostic techniques students were most likely to have opportunity to perform were skin scraping, coproscopy and X-ray (each rated as 83% agree or strongly agree) **(Figure 4.2)**. Whereas, a smaller proportion agreed there were opportunities to perform fluorescent dye test (41%), semen motility test (46%), Schirmer tear test (28%) and Tono-pen test (22%). Twenty-nine of the students entered free text comments and unavailability of laboratory equipment at placements was the main reason. Additionally, entry restriction at some laboratory facilities and a lack of laboratory based off-campus placements were also reported as causes.

> *"Diagnostic tools (Biochemical Analyzer, X Ray, USG) are not available in [*placement *X] and ophthalmoscope, Schirmer strip has not been observed at the placements in Bangladesh"*
>
> *"At [*placement *X], they didn't show us all the facilities they have in their Lab"*

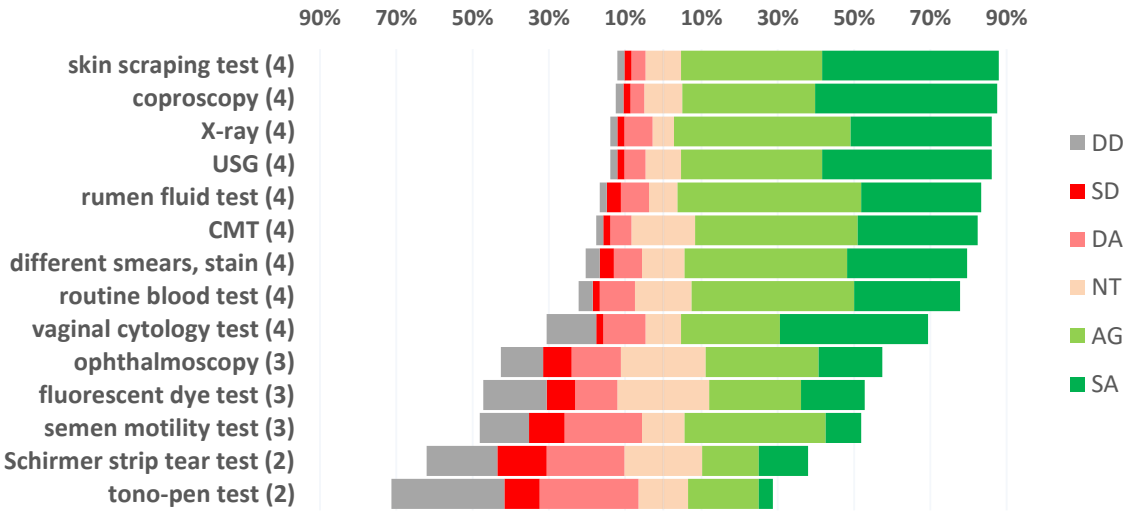


**Figure 4.2.** Opportunities to do laboratory activities

80% of the students agreed or strongly agreed that they had sufficient opportunity to perform a poultry post mortem **(Figure 4.3)**. However, there were limited opportunities to post mortem farm animals (9% agreed or strongly agreed), pet animals (17% agreed or strongly agreed) and wild animals (17% agreed or strongly agreed).

Twenty-one students entered comments, which further highlighted the issues:

*"Without poultry no scope of other animal postmortem"*

"*Large animal postmortem is done only once. So, it's not satisfactory"*

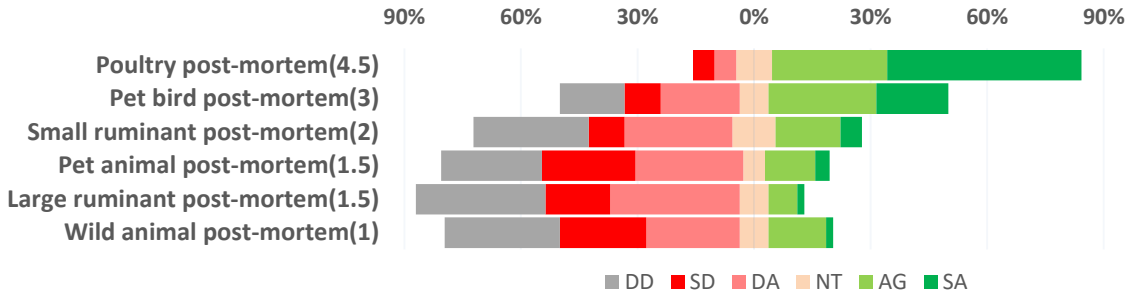


**Figure 4.3.** Opportunities to perform post-mortem

### 4.1.3. Students' opportunities for prescription writing, certificate writing, ration and diet chart formulation:

Students were mostly satisfied with the opportunities to write a draft prescription for farm animals, poultry and pet animals (80%, 89% and 78% agreed or strongly agreed, respectively) **(Figure 4.4)**. Twenty-two of the students made comments and these indicated some variability between placements and a few other restrictions.

"*At [*placement *X], under supervision of vet I had prescribed different drugs for pet, small ruminant and also large ruminant but at [*placement *Y] & [*placement *Z] no chance to prescribe drug"*

*"Prescriptions were mostly written by duty doctors in the placements"*

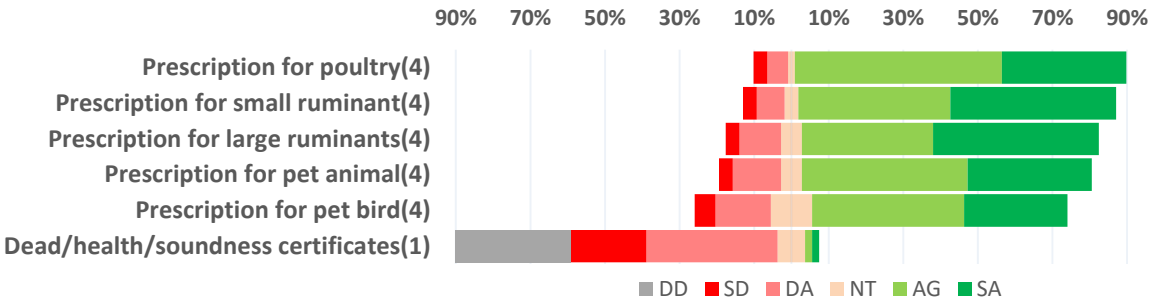


**Fig 4.4.** Opportunities to write prescription and certificates (median)

Students reported having very limited opportunities to write a draft health, death or soundness certificate for livestock and pet animals (55% disagree or strongly disagree, 33% didn't do) **(Figure 4.5)**. Ten students entered comments which indicated the reasons, such as limited demand for certificates from animal owners and that the duty doctors usually prepared the certificate.

Students reported having sufficient opportunities to visit production farms and assess farm-hygiene and bio-security parameters (79 % agreed or strongly agreed), but relatively fewer opportunities to prepare a farm plan (57 % agreed or strongly agreed) and formulate a ration (50 % agreed or strongly agreed) for livestock and poultry. Moreover, only 30% agreed or strongly agreed there were sufficient opportunities to prepare a diet chart for pet animals. One comment further highlighted the issue:

> *"More scopes and freedom should be provided to students for making farm planning, balance ration and preparing diet chart"*

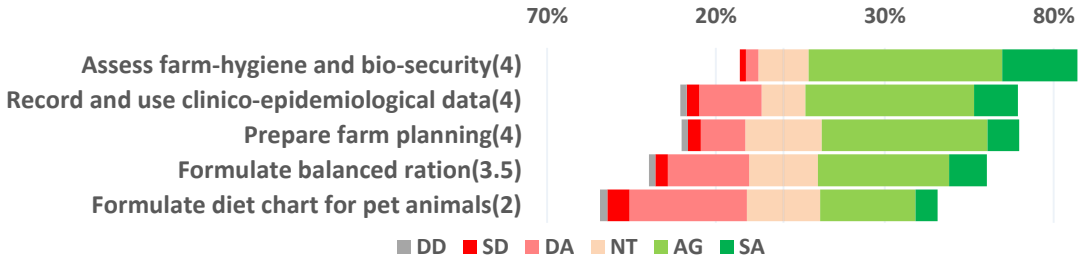


**Fig 4.5.** Opportunities to do husbandry related work (median)

### 4.1.4. Students' opportunities to undertake extension activities:

The students were asked if they were able to plan and execute different extension activities, assigned by the CVASU internship coordinator **(figure 4.6)**. In response most agreed or strongly agreed that they had sufficient opportunities to plan and successfully execute a programme for vaccination (89%), deworming (78%), farmer training (72%) and school kids (91%). Twenty-one students entered free text comments and shared their experiences and potential benefits of such programmes.

> *"Owners became aware of regular vaccination and deworming after these campaigns"*

*"During [*placement *X] rotation, I had opportunities to conduct school kid programmes and farmer training programmes"*

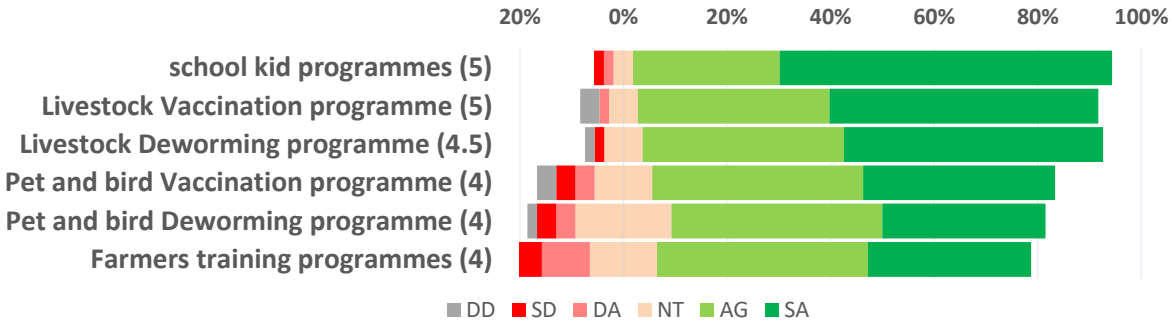


**Fig 4.6.** Opportunities to extension activities (median)

### 4.1.5. Structure and elements of work-based learning programme

During the survey, students were asked questions about the structure and elements of the WBL programme **(Figure 4.7)**. Most of the students agreed or strongly agreed (81%) that an initial conversation between the internship coordinator and placement providers, prior to sending the students, was helpful. 89% of students agreed or strongly agreed that faculty should have provide students with a feedback form to evaluate each placement. These views were illustrated in the free text comments:

*"Communicating directly or over phone with placement providers before sending students is very important"*

*"Overall feedback is not beneficial; the feedback should be taken after each and every placement"*

A small proportion of the students (28%) disagreed or strongly disagreed that the duration of the placements was appropriate. In the free text comments, it became clear that the number of working days allocated in some placements was less than required such as at TANUVAS, RV&FC, zoo, UVH and CCBDF,

*"TANUVAS duration should be increased. If not possible some wards at TANUVAS like OG and pet animal medicine should be increased at least"*

*"I think more time is needed at national zoo, RV&FC and TANUVAS ophthalmology and obstetrics units"*

However, some students felt that the duration of some placements was unnecessarily longer and could be shortened such as dairy farms, CVH, CDIL, LRI and UVH. In the comments section, they recommended the selection and duration of placements should be based on the availability of adequate learning opportunities. The free text comments support the findings,

> *"Placement duration should be reviewed and changed based on efficacy of placement"*
>
> *"We need to concise the overall time schedule and placement based on effectiveness.*
>
> *Dhaka base rotation should be assigned on winter season and UVH in summer season.*

Accommodation and travel were considered as challenges (69% of the students agreed or strongly agreed). Twenty-four students entered free text comments that further highlighted these issues and identified some other challenges: non-cooperation from the placement providers, adapting to learning in the workplace, and understanding language and water problem in overseas rotations.

> *"Arranging accommodation in Dhaka during Dhaka based placements was very difficult for us"*
>
> *"Long distance and scarcity of drinking water made us uncomfortable"*

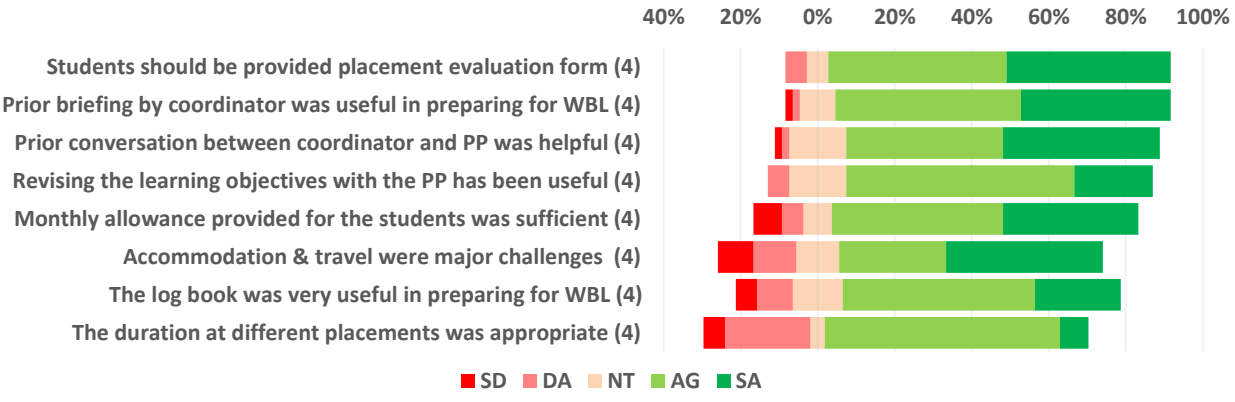


**Fig 4.7.** Agreement on different elements of WBL (median)

### 4.1.6. Placements and placement providers

Most students (81%) agreed or strongly agreed that the placement providers provided them with conducive learning environment in the workplaces **(Figure 4.8).** Additionally, the majority of students considered that placement providers and associated staff were very helpful and cooperative (87% agreed or strongly agreed). Placement providers had helped clear up any confusion students had regarding the placement (85% agreed or strongly agreed) or clinical cases (79% agreed or strongly agreed). There was some difference of opinions on providing monetary incentives to the placement providers. Just over half of the students agreed or strongly agreed (55%) that CVASU should provide monetary incentives to placement provides and some noted in the free text comments that other institutions did, whereas the rest of the participants showed neutral opinion (17%), disagreed (13%) or strongly disagreed (15%). Some students described some of the challenges and issues in the comment section,

*"Not all placement providers were equally co-operative"*

*"Some incidence of asking for monetary incentive at placement were quite embarrassing for us"*

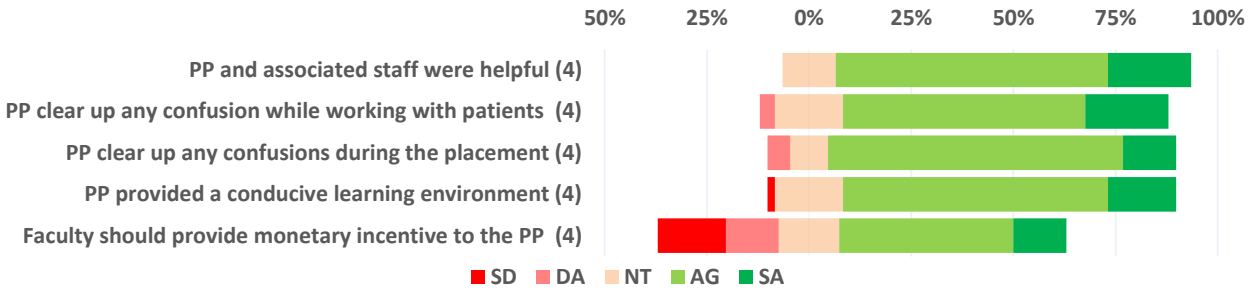


**Fig 4.8.** Agreement on Placement providers (median)
PP: Placement provider

### 4.1.7. Additional questions

At the end of the survey, students were asked to respond to a few questions about the significance and importance of WBL in their academic, professional and personal life **(Figure 4.9)**.

Most of the students agreed or strongly agreed (98%) that the internship/ externship experiences helped them in understanding their future veterinary career options. As the

placements are mostly off-campus, these were particularly useful for the students in learning to deal with real world situations and also helped them in developing professionalism (more than 95% agreed or strongly agreed). Almost all of the students agreed or strongly agreed (more than 98%) that completion of externships in different clinical placements had helped boost their skills and confidence in working with both farm animal and pet animal clinical cases in the field. They felt better prepared to work in a clinical setting with farm animal and pet animals (agreed or strongly agreed by 96% and 94%, respectively). A few of the students (24%) received job offers from various organizations (mostly pharmaceutical companies) during WBL which is certainly very inspiring for them. Respondents shared their views as follows,

"*Placements helped expose me to real life situation related to the veterinary field"*

*"Internship is an independent learning approach. Our own efforts helped us get the best outcomes from this"*

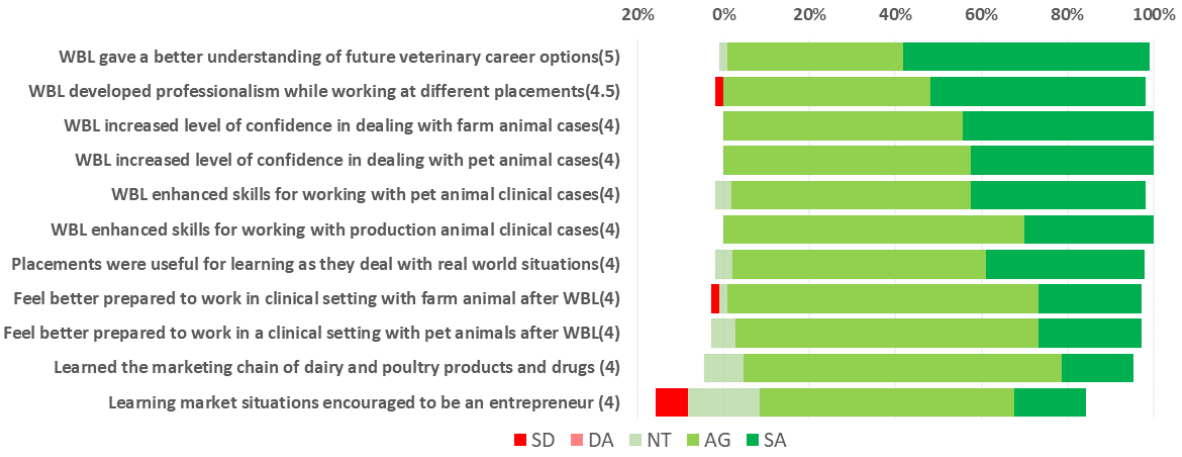


**Fig 4.9.** Agreement on benefits of WBL (median)

Students were asked to list the top three skills that they had learned through the WBL program **(Table 4.1)**. Fifty-three students (all except one) responded to the question. The most frequently listed skills were: diagnostic strategies (22), treatment protocols (22), communication skills (17) and working with clients (13). Students were also asked to list any skills that they were not exposed to on placements **(Table 4.1)**. Thirty-three students responded and most commonly mentioned needing more opportunities to practice surgery (13), post-mortems (5), and ophthalmology cases (5). They also indicated about insufficient opportunities of doing artificial insemination, ration formulation, laboratory

activities, pregnancy diagnosis, anesthesia etc. When asked about the best aspects of their WBL experiences, all except one student responded (Table 10). They most frequently mentioned the hands-on experience (7), dealing with diverse clinical cases (7), being in the real veterinary workplace (6), learning field diagnostic techniques (6), and adapting to learning in a new environment (6). Besides, experiencing professional environment, growing confidence, introducing new places and culture, working opportunities in overseas placements, getting adequate exposure to farm and pet animal clinical cases along with several rare diseases and working as a team with patience at different professional workplaces were also mentioned as best aspects of placement experiences during WBL.

> *"The best things for me were growing confidence in myself to handle clinical cases in field conditions, sharing cultures with different people from different countries and learning to adapt in adverse conditions"*
>
> *"I found lots of clinical cases of poultry, cattle and pet animals. I learned how to adapt in new places and adjust with different foods and accommodation"*


**Figure 4.10.** Desired skills but didn't get exposed to on placements

**Table 4.1.** Opinions on different aspects of WBL

| **What were the top 3 skills you learned on the placements?** (53 students responded) | | **Are there any key skills you feel you are not getting exposed to on placements?** (33 students responded) | | **Overall, what were the best aspects of placement experiences?** (53 students responded) | |
|---|---|---|---|---|---|
| Diagnosis strategies | 22 | Surgery | 13 | Hands on experience | 7 |
| Treatment protocol | 22 | Post-mortem | 5 | Dealing with diversified clinical cases | 7 |
| Communication | 17 | Ophthalmology | 5 | Introduce with the real veterinary field | 6 |
| Patient handling | 16 | Artificial Insemination | 3 | Learning field diagnostic techniques | 6 |
| Working with clients | 13 | Ration and diet chart formulation | 2 | Adapting to learning in new environment | 6 |
| Professionalism | 7 | Handling patient alone | 2 | Experiencing professional environment | 5 |
| Confidence | 7 | Laboratory activities | 2 | Grow confidence | 5 |
| Adaptation | 7 | Pregnancy diagnosis | 1 | Introduce with new places and cultures | 5 |
| | | Anesthesia | 1 | Adequate exposure to farm animal clinical cases | 4 |
| | | Neurological cases | 1 | Adequate exposure to pet animal clinical cases | 4 |
| | | MRI, CT scan | 1 | Exposure to certain rare clinical cases | 4 |
| | | Poultry Parent stock management | 1 | Overseas placement | 4 |
| | | Administrative skill | 1 | Team work | 1 |
| | | | | Learning patience | 1 |

### 4.2. Focus Group discussion

Four separate focus group discussions were conducted with relevant stakeholders including students (7), recent graduates (6), teachers (7) and placement providers (8). Students and recent graduates were selected in such a way that each group had participants

possessing variable CGPA and gender representation. The teachers were from different departments including Faculty Dean, Director of TVH and Director of External Affairs. Representatives of various government and private organizations were included in the placement providers group from both clinical and production placements. The overall male and female ratio were 5:2.

The questions the focus group participants were asked are listed as subheadings below with the themes and sub-themes that were identified during the analysis of the transcripts. Illustrative quotes are included for the main themes.

### 4.2.1. What are the main benefits/advantages of work-based placements / internship placements during the one-year internship period?

When participants were asked about the benefits of WBL several themes emerged that were common to all groups. These were **practical learning** (including the sub-themes of 'self-involvement', 'achieving Day-one-skills' and 'learning to work at resource-scare setting'), **experiencing professional workplaces** (including the sub-themes of 'develop confidence and professionalism' and 'proximity to different people and culture') and **knowledge sharing**. According to most of the participants, WBL provided students with exposure to real veterinary work and opportunities for hands-on practice and independent learning. Teachers identified it an obvious opportunity for students of achieving day-one skills.

> *S: "We have the opportunity to learn, explore and witness lots of practical stuff in this internship period, because in University we mostly get the theoretical knowledge"*
>
> *T: "As a veterinarian, I think the main advantages of WBL are having the opportunity to achieve day-one skills."*

Work-based Learning also enabled the students to experience a professional environment in the real workplace and helped them develop their professionalism and gain confidence by providing opportunities to work with different people at home and abroad and get acquainted with different cultures.

*G: "Internship is the time between the end of academic study and professional life. Students get an idea of the current situation of veterinary profession and also about different challenges at real workplace."*

*S: "While working as an intern at home and abroad, we have to work with many different types of people and get familiar with diverse cultures that enhance our knowledge, skills and professionalism. Also, we get prior idea about workplace environment"*

Graduate students and placement providers found WBL was an opportunity to share knowledge and create a bridge between the field practitioners and the academic institute, which plays an important role in the professional and educational development of both.

*P: "Taking intern students as a trainee helps us to be updated on new diagnostic techniques and treatment protocols"*

### 4.2.2. What currently enables or prevents the students to get sufficient opportunities to be involved with clinical cases? What might help increase the level of opportunities for the future?

Several themes were identified from the responses of participants. Each stakeholder group cited the main reasons students get sufficient opportunities as **abundant caseload at clinics, the enthusiasm of students,** and **cooperative placement providers**.

*S: "I was very keen to work and it helped me get the opportunities. When I showed my interest in involving with clinical cases at placement 'X' and 'Y', the responsible doctors appreciated and permitted me to handle and treat patients."*

Another point mentioned by graduate students and teachers was that the reputation of the university enhanced the availability of WBL opportunities for students.

Sometimes there were certain restrictions that prevented students being directly involved with clinical and production related cases. For example, when placement providers had to do administrative works, students receive less supervision. Some students show apathy, possibly due to a lack of confidence or inadequate monitoring by faculty.

*P: "I found some students unpunctual and irresponsible to their assign duties at my workplaces. Because of their poor attitudes, I was not able to provide them enough opportunity to work."*

A theme emerging from all groups was that if the students show sincere interest in working and are accountable for their duties in the workplace, then they will get enough opportunities. Other factors that contribute to creating a conducive work environment with sufficient opportunities for students included continuous monitoring of student activities by faculty by gathering regular feedback, and maintaining strong relationships with the placement providers by involving them with different activities of the university (e.g. invite in scientific conference and seminars, arrange training programmes and appoint them as examiner of internal examinations).

*G:" Students need to have strong morale and confidence in the workplace and at the same time, they need to show enough professionalism there. Also, they have to be self-motivated, dedicated, and hardworking."*

*T:" University should maintain strong relationship with placement providers not only during internship period, but also throughout the year.* We used to organize many training programmes, workshops, conferences here and we should not forget the placement providers at that time."

### 4.2.3. What do you think are the main reasons for students not getting sufficient opportunity to perform postmortem of pet and farm animals? How could this be improved for future students?

The survey results had indicated that most interns did not get sufficient (probably none) opportunities to perform post-mortems of farm and pet animals. While talking about the possible causes in the FGDs, the major themes that emerged were the **lack of awareness by owners** and **reluctance of veterinarians** to perform postmortems. Reasons included animal owners being unaware of the value of a post mortem and complications of bringing the dead farm animals to the hospital.

*S: "Except poultry, it is very difficult for the farmers to bring dead animals to hospital for postmortem"*

*P: "Sick farm animals (about to die) are slaughtered at any moment of emergency to minimize the economic loss."*

The placement providers added that there are often political problems in the case of farm animals (vetero-legal cases), and pet animal owners do not want a postmortem because of their love for their pets. Sometimes, students had found that veterinarians and hospital staff were reluctant to do a postmortem. Graduates reported not being confident to do postmortems of species other than poultry.

*G: "In undergraduate studies, we didn't get enough opportunity to do postmortem which results lack of confidence among us".*

One proposal to improve opportunities for students to perform postmortems was to raise public awareness of the value of postmortems of their livestock and pets. Additionally, they emphasized the need to increase the in-house facilities of postmortem teaching at CVASU.

*T: "At veterinary schools in the USA, we have seen that they had connections with wildlife organizations. And those organizations send animals for postmortem regularly for students' learning."*

**4.2.4. What do you think are the main reasons for students not getting sufficient exposure to reproductive clinical cases in pet animals? How could this be improved for future students?**

The FGDs identified two main themes as reasons that students did not get sufficient exposure to reproductive clinical cases for pet animals including **scarcity of theriogenologists** at field level and **limited diagnostic facilities at veterinary hospitals**. All stakeholder groups voiced the opinion that at the moment there are insufficient reproductive disease specialist veterinarians in the field. Even, the number of pet animal patients with reproductive problems was very low in the placements outside the urban areas like UVH. Along these, certain barriers for students to practice and learn about reproductive system diseases of the farm animals in the placements inside the country were also discussed in FGD sessions. Farmers were not very aware that they could bring their animals to the hospital and most of the time, rural quacks, unskilled veterinary field

assistants, AI technicians, or other NGO workers visited farms or households to deal with reproductive problems. However, when the veterinarians visited the farm, for practical reasons (remote location and inadequate transportation facilities) they would not be able to take the students with them.

> *G: "A lot of AI technicians and NGO workers are active in the field and handle most of the gynecological cases. So, the animals were rarely brought to the hospital"*
>
> *S: "Associated staff and sometimes veterinarians in [Placement X] went to farms and treat the reproductive cases. But they were not interested in taking us along"*

Participants from all groups complained that most veterinary hospitals did not have the necessary equipment (e.g. ultrasound machine) needed to diagnose reproductive disease. Several possible solutions were suggested including arranging continuous education programme (CE) for field veterinarians to provide additional training on animal reproduction and reproductive diseases. Teachers and graduates also suggested students should show more interest in attending gynecological cases and visiting farms with veterinarians and hospital staff. Several groups (graduates, teachers and placement providers) recommended improving the internal facilities of the theriogenology unit at Teaching Veterinary Hospital (TVH), CVASU which would provide students with more hands-on experience and enable them to acquire more practical knowledge on reproductive diseases of farm and pet animals.

> *G: "It is very important for the university to have a rich and well-developed farm under its own management where students can take hands-on training and learn to put into practice the knowledge they have acquired".*
>
> *T: "Artificial insemination (AI) is the main concern of farmers. If we can train our students on this and take over this in field, then we will get the reproductive cases."*

### 4.2.5. What do you think are the main reasons for students not getting sufficient opportunities to perform general anesthesia and deal ophthalmology cases? How could this be improved for future students?

The main theme that emerged from the focus groups with all four stakeholder groups was a **shortage of necessary equipment** in veterinary hospitals which prevented the students

from getting adequate opportunities to perform general anesthesia and deal with ophthalmology cases. Additionally, lack of specialist veterinarians in the field and restrictions on students being allowed to handle critical cases were also mentioned by students and graduates. They also reported that sometimes hospital staff were reluctant to deal with critical cases, at times not knowing how to use the available equipment properly.

> *G: "My placement supervisor did not want me to deal with anesthesia problems of patient. While dealing with a wound case, I wanted to apply local anesthesia. But he did not permit"*

Students suggested that ensuring the availability of appropriate equipment in veterinary hospitals and proper utilization of them is the best way to create opportunities for future students during WBL. Consistently and emphatically, participants from all focus groups said that TVH should provide enough opportunities for all students to perform general anesthesia and deal with ophthalmology cases.

**4.2.6. What do you think are the main reasons for students not getting opportunities to practice writing a prescription and health/death certificate? How could this be improved for future students?**

In the survey, although most students reported having sufficient opportunities to practice writing prescriptions while under the guidance of registered veterinarians, some reported insufficient opportunities and variable experiences noted that there would be more opportunities if students could demonstrate their competence in writing prescription at real workplaces.

**4.2.7. What do you think are the main reasons for students not getting sufficient opportunity to perform certain diagnostic tests (e.g. X-ray, ultrasonography)? How could this be improved for future students?**

While the opportunities to perform certain diagnostic tests (e.g. X-ray, ultrasonography) were insufficient for students during WBL, the principal barriers identified by all groups were lack of machines and manpower in hospitals.

> *P: "In my clinic, there is no X-ray or USG machine. We usually refer the patients, require X-ray or ultrasonogram, to TVH or pet hospital Dhaka".*

However, all focus groups highlighted the pressing need to provide more exposure to these techniques at TVH. Placement providers suggested arranging more suitable placements where all types of diagnostic facilities were available (such as private pet hospital, RV & FC, National zoo etc.).

### 4.2.8. The majority of students did not feel that the distribution and/or time allocation for different internship placements was appropriate. What changes would you suggest?

All focus group participants discussed in detail the amount of time allocated to different workplaces. Every group identified several placements that could be longer, with all mentioning RV&FC (military dairy farm), RV&F Depo (military dog and horse squad), zoo, poultry farms and overseas placements. In addition, a few students and graduates suggested extending the duration of the placement at UVH.

> *S: Military dairy farms gave us a very good opportunity to learn about modern dairy farm management. Time can be increased for this placement from one week to one month.*
>
> *S: "Minimum one well-organized poultry farm should be managed for the students. If we could follow the whole management for at least one day in the farm, it may be effective for learning"*
>
> *P: "Only three days are not enough for students to gain a basic knowledge on wild life at national zoo, I highly recommend to extend the duration to 7-15 days"*

Additionally, teachers, students and graduates recognized that some placements could be shorter, all mentioned the intramural laboratory rotations. Students also suggested shortening the duration of the dairy farm rotation, but placement providers mentioned that allotted time for each dairy farm should be extended and properly utilized. Students and graduates suggested that the time allocation at certain government organizations in Dhaka should be revised and restructured.

> *S: "Instead of sending to a new farm daily, the authorities should select three dairy farms of a different category (poor, moderate and best) and allow students to work there for a longer period."*

There were some unique views expressed by some participants in the focus groups as illustrated by,

> *S: "Students could be sent to different govt. offices in Dhaka as VISIT or a TOUR with a faculty member for one day only. If they are sent as an internship placement for a short period, the placement providers may take it as negative way, because other veterinary schools send their students for longer period"*
> *G: "UVH placement should be allotted based on available opportunities and active, dedicated and cooperative placement provider, not on home town"*
> *P: "In my private veterinary clinic, we can take five to ten students weekly for internship training"*

### 4.2.9. How the students should be helped to face the major challenges (travel and accommodation)? What are the other challenges of work-based placements / internship placements during one-year internship period?

In the survey, 69% of the students had reported travel and accommodation as major challenges during WBL. Therefore, focus group participants were asked to share their thoughts on possible solutions for these challenges. The major themes that arose from the responses were **students learning to adapt to a new environment** and **accommodation being provided for students during the Dhaka rotation by faculty.** All groups acknowledged the challenges related to accommodation and travel and the courage required when entering the real workplace and learning to adapt to a new environment. Also, all focus groups recommend that the faulty should arrange accommodation at workplaces, especially during Dhaka based rotations. The teachers and placement providers came up with the idea of arranging a centralized accommodation facility for students from all veterinary schools in Dhaka, as all students undertake internships at different private and govt. organizations in Dhaka.

> *S: "Faculty should arrange accommodation for us while doing internship in Dhaka, otherwise, it would be very difficult to arrange accommodation for ourselves.*
> *T: "The National Veterinary Dean Council could arrange central accommodation facility in Dhaka for all DVM intern students in Bangladesh"*

The students also objected to the announcement of new placement at very short notice. Dairy farm placement provider suggested providing transport facility for students to go to farms early in the morning. While discussing other challenges, one teacher said that with the growing number of female students, it would be very difficult for the faculty to provide safe accommodation for everyone. Students and graduates identified the communication gap between faculty and placement providers as another major challenge.

> *S: "It will be better, if Director of External Affairs (CVASU) talked to the placement provider over phone about my placement, rather sending a letter to the placement provider by me without prior notice"*

**4.2.10. Should the placement providers receive monetary incentives for their time? What other non-monetary incentives could be provided to placement providers? Are there any other major challenges that placement providers encounter that impact student learning?**

With the exception of one of the placement providers, all participants in all four focus groups unequivocally agreed that placement providers should not receive financial incentives. Students considered WBL as an opportunity for mutual knowledge sharing, with students gaining valuable practical experience while veterinarians could be informed about new innovations.

> *S: "It's an opportunity of knowledge sharing for both of us; even in some respects I may be more knowledgeable about certain updated issues than placement providers. If we exchange knowledge without exchanging anything like money, there will be more respect among us".*

One placement provider considered that placement providers should be paid for their time and teaching and explained why:

> *P: "CVASU should provide monetary incentives as other veterinary schools are doing. Otherwise, learning might be compromised"*

However, the remaining placement providers considered that although teaching students did create additional work, they did not see it as an extra load. Students and graduates raised concerns that providing monetary incentives could have a negative impact as the

quality of the teaching might then vary depending on the size of the payment. Students believed that whether the placement providers were paid or not, their learning will be the same.

During discussions about providing non-monetary incentives to placement providers, all considered this could be as a symbol of honor and respect, a gift from the University and students. According to the graduate students, it would help to create a positive learning environment at workplaces.

> *G: "Providing incentive will increase cordiality and cooperation between students and placement provider"*

All of the focus groups highlighted the pressing need to strengthen the relationship between the university and placement providers. Graduates and teachers mentioned that inviting placement providers to various events at university could be one of the most effective ways to build good relations between the two sides. The placement providers stated that if they are invited to various events at the university (conference, workshop, continuous education programmes, etc.) it would be a great honor for them, would further enhance their affiliation with university and also would motivate them to teach students at workplaces even if no monetary incentive is given.

> *P: "We'll be honored if we are invited for meeting, workshop, conference and as examiner at CVASU"*

Moreover, students and graduates reported some other challenges that placement provider encountered including non-cooperation from associated staff, not being allowed to handle all cases, and sometimes multiple supervisors at one placement who wanted a student to do different work at the same time.

> *S: "In [placement X], one placement provider wanted to take me with him in different training programmes; on the other hand, another placement provider wanted me to stay in the hospital and treat the patients. Sometimes it gets me in trouble"*

### 4.2.11. Stakeholder specific questions (Students):

#### 4.2.11.1. How was the level of cooperation from the placement provider and associated staff?

The students admitted that the cooperation from placement providers and associated staff at most of the placements was generally good, although a few reported experiencing hostile environments at some placements. Describing the actual experience, students commented on some variability in different workplaces,

> *S: "At UVH, everybody was cooperative; I used to be good to them, so they helped me a lot. I got minimum cooperation in Dhaka based rotations. In India placements, we got sincere cooperation from the concerned authorities"*
>
> *S: "Initially my supervisor was not cooperative, but later he was so satisfied with my work that he requested me to stay there for few more months"*
>
> *S: "At the placements in Dhaka rotation, a few of the supervisors were not happy with us, because we were there for very short duration, they were not paid any incentive and were not invited at CVASU in any occasion"*

#### 4.2.11.2. What were the most useful and challenging parts of the internships?

Opinions varied on the most useful and challenging parts of WBL. Students felt that their greatest achievements were improving communication skills, learning about different diagnostic techniques and treatment protocols in the field, and gaining confidence in dealing with patients alone in real workplaces. They also considered being able to do an internship at various reputed institutions in the country and abroad as an honor and another important benefit of the internship programme.

> *S: "At different placements, I had ample opportunities to make my own decisions regarding treatment, whereas, at TVH there were teachers and seniors to help us.*"

Adapting to the new environment and new workplace was a big challenge for students. Additionally, it was not easy for them to communicate with people of different cultures in different places. Students also mentioned that it was a challenge to get adequate cooperation from the placement providers during some placements.

#### 4.2.11.3. What should be added or changed to the internship programme for future students?

In order to improve and expand students' skills and practical knowledge on poultry farming, participants recommended including poultry and breeder farm placements for WBL for future students. They also advised reviewing the existing schedule of the internship programme and managing the entire programme according to a pre-fixed schedule in the future. Students consistently urged a change in the time allotted to different workplaces, especially reducing the duration of the in-campus laboratory rotations. They highlighted the importance of faculty contacting placement providers prior to sending the interns to the placement. In addition, some students suggested that the logbook provided to them should be restructured to make it easier to fill in. Finally, they suggested organizing a job fair with employers and a scientific conference that all students, placement providers, and other dignitaries attend at the end of the internship programme.

> *S: "In keeping with the previous continuity, it is very important to organize a scientific conference every year for future students, though we've missed this year. Through this, students will get an opportunity to present different aspects of the entire internship programme and their research outcomes on clinical and production reports in front of everyone."*

### 4.2.12. Stakeholder specific questions (Recent graduates):

#### 4.2.12.1. What were the most useful parts of the internships in preparing students for their job?

According to the recent graduates, work experience in different organizations helps students build confidence which prepares them for their future job. In addition to enhanced competencies, it also helps them become acquainted with new people and places, and improve their communication skills.

> *G:" Internship or WBL increases confidence level of students. He can learn some real experience from field level. He gets a chance to providing treatment alone in field condition without help of teachers and friends."*

#### 4.2.12.2. What should be added or changed to the internship programme to better prepare students for jobs?

Recent graduates recommended including pharmaceutical companies as a potential placement for students, as there are many job opportunities in this sector. They also suggested the faculty to provide students with workplace opportunities based on their career goals. They also urged the faculty to arrange various motivational programmes and workshops (e.g. scientific research, report writing etc.) for the students at regular intervals.

> *G: "During the internship, students need to be given the opportunity to work towards their future goals. If a student wants to be a researcher, he should be given ample opportunity to do research works under supervision of a teacher"*

### 4.2.13. Stakeholder specific questions (Teachers):

#### 4.2.13.1. What are the main benefits and challenges of the internships for CVASU (and its students)?

According to the faculty members, the reputation and fame of the university were enhanced both at home and abroad as a result of the proficient performance of students during WBL. In addition, a lasting good relationship was established between the university and different public and private organizations and as a result, the graduates could more easily obtain jobs in those places.

> *T: "Recognition and reputation of CVASU is increasing day by day because of students' performance at different workplaces during internship period. It helps our graduates get jobs in different professional sectors."*

Teachers also acknowledged that students encountered some of the changes in veterinary practice (such as new clinical cases, diseases, techniques) while at different workplaces, which in turn would help the faculty in revising the curriculum and approaches to teaching.

Teachers noted that the increasing proportion of female students was a challenge because of the problems in arranging safe accommodations for them during off-campus rotations. Finally, the Director of External Affairs (Internship coordinator) noted the difficulties associated with running the internship programme with little manpower.

#### 4.2.13.2. What should be changed in the internship programme to make it better for placement providers and students?

All of the teachers emphasized that proper monitoring of student activities would improve the internship programme for placement providers and students. During the internship, students submit two reports (a clinical and a production report) which are supervised by the two different teachers. It was recommended that both supervisors need to monitor their students' performance throughout the year and provide them with the necessary guidance on a regular basis. One of the participants suggested the possibility that teachers could observe the student's activities in the workplace during an unannounced visit.

> *T: "The clinical and production report supervisors of each student should also monitor activities of students during rotations at different workplaces."*

#### 4.2.13.3. What CVASU should do in its teaching and learning approaches to better prepare students for the internship programme in the future and to make up the deficiencies when students did not get sufficient opportunities to do various skills?

All participants expressed the need for increasing the core facilities at the TVH and advised to have more of a focus on practical classes. There are vital and up-to-date modern techniques that students may not have the opportunity to practice during their off-campus placements, so the university should provide students with proper training and opportunities to practice these techniques.

### 4.2.14. Stakeholder specific questions (Placement providers)

#### 4.2.14.1. What are the main benefits and challenges of the internships for placement providers?

Most of the placement providers appreciated the presence of students at their workplaces as they provided an additional helping hand, especially when there was a shortage of skilled manpower. However, while dealing with administrative work and busy schedules, it is often difficult to set aside time to teach the students.

*P: "Due to busy schedules, sometimes it becomes difficult for us to spend time with students, discuss various topics with them, and teach different diagnostic and treatment strategies at the field level."*

**4.2.14.2. What changes in the internship programme could make it better for placement providers and students?**

The placement providers wanted students to be more disciplined and accountable while in the workplace. The most common suggestion was for the faculty to increase the monitoring of students' activities during off-campus rotations. They suggested creating a monitoring group of faculty members who would be responsible for checking the performances of every student. One recommended a team from university should make surprise visits to workplaces.

*P:" There should be a monitoring cell from the faculty who will maintain regular communication with us and observe the activities of their students. They can make a surprise visit sometimes to check how the students are coping up with the real working environment."*

The participants suggested that students should be given more exposure to certain specialized areas, including pet animal practices, hatchery management, feed mill and different wildlife placements e.g. snake farm, crocodile farm, deer farm etc. One of the placement providers drew everyone's attention to the benefits of introducing an elective placement,

*P: "During one-year internship there should be a one-month slot of open option. So, the students can use this opportunity to do an internship at a placement related to their target career."*

# Chapter 5: Discussion

In all 11 veterinary schools in Bangladesh, an internship or work-based learning (WBL) programme is run in the final academic year of the DVM undergraduate curriculum and is of variable length (6 to 12 months) (Samad and Islam, 2016; Hoque and Anwer, 2018). To the best of our knowledge, very few wide-ranging studies have been undertaken in the context of veterinary WBL in Bangladesh to date and many important factors related to WBL have not been identified and analyzed (Debnath, 2006; Samad et al., 2015; Samad and Islam, 2016; Hoque and Anwer, 2018). The present study aimed to evaluate and analyze the existing WBL programme in Chattogram Veterinary and Animal Sciences University (CVASU), Bangladesh and to identify the benefits, challenges, options and stakeholder perspectives. A survey was administered to students and a series of focus group discussions were conducted with WBL stakeholders and provided a range of perspectives on the diverse opportunities for students at different placements as well as highlighting different benefits and challenges. Hopefully, the findings of the present investigation will increase the insight into WBL at CVASU and in Bangladesh, and are likely to serve as a foundation for future researchers. The significant findings of the study have been discussed under the headings below.

## 5.1. Working opportunities for students and obstacles

Some variability was evident in the students' opportunities to perform different activities at off-campus placements during WBL. It appears that most of the students had sufficient opportunities to observe and assist with farm and pet animal clinical cases at placements, and to communicate with the patient owners and gather relevant clinical and epidemiological information about the case presented. This corroborates with the findings of the previous work conducted in various overseas countries (Charles, 2018; Gordon-Ross, 2014; Scholz et al., 2013; Baguley, 2006). However, the opportunities to directly handle and perform procedures were reported to be fewer than expectations of CVASU intern students, and similar issues have been reported in two other countries (Charles, 2018; Scholz et al., 2013). Some of the important reasons behind the variability in the students' opportunities to learn related to the case load at different clinical placements and

the availability of proper treatment facilities. For example, veterinary hospitals in remote areas usually have fewer clinical cases due to difficulties in communication and the lack of proper diagnostic and treatment facilities. As a result, the students who have to work in these hospitals are deprived of dealing with enough number of patients. Student opportunities to directly handle clinical cases and perform procedures also depended on the attitudes, perception and cooperation of the placement provider to having students in the workplace and the pro-activeness of students. Sometimes placement providers could not allow students to get directly involved with clinical procedures because they do not have full confidence in students' abilities and for other reasons, for example, condition of the patient. These explanations are supported by Charles (2018) and Scholz et al. (2013). To have direct involvement in clinical procedures in the field, students should be pro-active and well prepared through in-campus training prior to WBL. Additionally, improved communication between the faculty and placement providers might help placement providers understand students' abilities and motivate them to allow the students to do more.

Another important finding indicated that students dealt with relatively more pet animal cases along with assessing lung and heart sound, collecting and testing skin scraping which could be because of their overseas placements (India, Malaysia and Thailand) where pet animal patient numbers were quite high. This outcome is however contrary to that of Samad and Islam (2016) who found a higher number of farm animal cases in comparison to pet animals. In the current study, while working in overseas placement (MVC of TANUVAS), all of the students got exposure to a relatively large number of pets in comparison to farm animals, which undoubtedly reflected in the overall results. Again, at UVH where the number of farm animal clinical cases is supposed to be higher because of being geographically located in remote areas, but variability in caseloads and uneven working opportunities in different placements (as each student is assigned to a different UVH), affect this finding. Before allocating UVH placement for the students, faculty should prioritize those places, where there are a sufficient number of farm animal patients regularly and will help the student in gaining practical experiences.

Students had relatively better opportunities for dealing with reproductive cases of farm animals in different placements than pet animals which agrees with the previous observation of Samad and Islam (2016). At different clinical and production placements inside the country, students had sufficient opportunity to do rectal palpation, heat detection, and pregnancy diagnosis of farm animals, since the farmers are concerned about any reproductive problems of their animals and typically seek the help of a doctor in a veterinary hospital or on their own farm. Although not all types of diagnostic equipment (e.g. Ultrasonography machine) are readily available, experienced veterinarians do their utmost to treat reproductive problems of the farm animals using appropriate diagnostic techniques (e.g. rectal palpation) and try to impart knowledge to the students at the same time. The survey revealed several experiences of students in handling varieties of reproductive disorders of farm animals at overseas placements (TANUVAS) where they were also able to practice rectal palpation, and other common procedures on cattle and buffalo. Analyzing the free text results of the survey and focus group discussion indicate that, the absence of skilled and experienced pet animal reproductive disease specialists in the field and the lack of necessary equipment in veterinary hospitals (such as USG) in Bangladesh are mostly responsible for fewer opportunities for students in dealing with pet animal reproductive cases. Again, even though there are enough pet animal patients in overseas placements, students have very limited opportunities to deal with patients with reproductive disorders there. Increasing the number of placements at private veterinary clinics within the WBL programme can be an effective step in improving the training of students in this regard in the future.

A further significant outcome indicated there were inadequate opportunities for students to perform anesthesia on both farm and pet animals. Although local anesthesia is commonly used in minor and major surgeries of farm animals, many students did not get enough opportunity to apply it. However, Börchers et al., (2010) observed that most students had opportunities to assist in surgery and monitor anesthesia twice weekly at extramural placements in Germany. In WBL placements in Bangladesh, students usually do not have access to major surgeries (e.g. spaying, caesarian section, fracture management, etc.), although they are occasionally allowed to observe. Sometimes students cannot apply local anesthetics while performing minor surgery, such as castration, wound dressing, etc., due

to the unavailability of drugs and lack of permission at workplaces. The important fact is that most of the hospitals in the country do not have the necessary equipment for general anesthesia and though found in some places, it often remains unused most of the time. In TANUVAS, students are not given the opportunity to work in the surgery unit. But even though students were allowed to enter the operating theatre at UPM and KKU, they were only allowed to observe. Well-equipped private veterinary clinics can be an important option to provide students with the opportunity to practice anesthesia.

The survey revealed that the students got enough opportunity to do poultry postmortems at UVH placement, but unfortunately, the opportunities in farm animals, pets, and zoo animals were reported to be negligible during WBL. In the 3rd and 4th academic years, students have many opportunities to perform postmortem of poultry in TVH, and in their practical classes. Some renowned poultry specialists from the faculty had given them additional hands-on training in poultry postmortem at different times. This instilled confidence in the students which motivated them to do poultry postmortem efficiently at the field level. As well as at different placements, especially in UVH, they got enough poultry for postmortem, because farmers often take samples of dead birds from their farms to the hospital to seek advice on proper treatment and farm management. On the other hand, just as students rarely had the opportunity to do postmortem of farm animals, pets and wild animals in university, they were also deprived of the opportunity in off-campus placements during WBL. The reality is that owners are very rarely interested in postmortem of the dead pets as well as farm animals, and may not be properly aware of the need for it. Owners do not want to incur extra costs for bringing dead animals to the hospital. Although farm animal postmortem cases are sometimes available in government veterinary hospitals like UVH, most of the time they involve vetero-legal issues, so there is rarely any possibility for students to participate. The university should arrange the proper facility to teach the students about the postmortem of different species.

There were opportunities to perform common laboratory tests in overseas placements, but virtually none in national placements. It emerged that there were not enough opportunities for students to do certain important laboratory and diagnostic tests including fluorescent dye test, semen motility test, Schirmer tear test, and Tono-pen test. However, Börchers et

al., (2010) also demonstrated in their study that different common laboratory activities and diagnostic tests were carried out by students several times per week. In most Bangladesh placements, where CVASU students are sent for WBL, there is a shortage of the necessary laboratory equipment and chemical reagents. Moreover, due to the controlled access of outsiders to most of the laboratories, the students could not participate in the laboratory work properly. At this time, students need working opportunities in well-equipped clinical laboratory and surveillance unit outside the university where they will be able to enhance their skills by engaging in various laboratory works as well as diagnostic tests. According to the survey and FGD students got a chance of practical learning on various eye diseases of livestock and pets and got acquainted with the use and application of different ophthalmology equipment while working at overseas placement (TANUVAS). It is worth mentioning that, there is rarely any opportunity for them to learn and practice various eye diseases of animals in placements in Bangladesh, even at TVH. It is very important to train the students on ophthalmology through proper utilization and application of the equipment available at TVH.

One of the most important skills a DVM student should possess before starting their professional career is the proficiency to make an accurate prescription for the patient, however, a portion of students reported not getting the proper opportunity to practice this during WBL. Debnath (2006) also found that students requested more practice in prescription writing. Also, it is noticeable that most of the students did not get a chance to write a draft of a health, death, and soundness certificate for animals. Many patient owners do not feel comfortable receiving full treatment and prescriptions from an intern student at veterinary clinics. Sometimes, placement providers are skeptical of students' ability to treat patients and write prescriptions because they are not provided with any information on student abilities by the faculty. In addition, an intern student is not authorized to write a full prescription by himself for patients before passing DVM courses. However, this study’s findings suggested the students to be dedicated, enthusiastic, and responsible in the workplace and show sincerity and interest in treatment and writing prescriptions. The placement providers should allow students to create draft prescriptions, check their writings, and guide them accordingly. In the Extramural Study (EMS) guideline by RCVS, it is recommended to involve students with all clinical activities at off-campus placements

under the supervision of a registered veterinary surgeon (EMS RCVS 2019). Bell et al., (2010) point out those inquisitive, passionate, and diligent students had the most opportunities to acquire knowledge through practical work at placements. One of the most important things identified through this study was for the faculty to notify the placement providers about the capabilities of a student in detail, before sending the students to the work places._Millington (2013) also referenced that the supervision of placement providers must be based on the level of competencies of the students and it is important to apprise them with the necessary guideline.

During WBL, students had sufficient opportunities to visit and work at different production placements, including dairy farms, broiler and layer farms, poultry breeder farms, RV&FC, and CCB&DF. They observed, assisted and were directly involved with various farm management activities, and had the opportunity to enhance their skills. While working in the UVH and TANUVAS they were able to make visits to different dairy and poultry farms and had access to farm-hygiene and bio-security parameters. This seems to be consistent with the earlier study by Samad and Islam (2016) who also cited sufficient similar learning opportunities for students in different livestock and poultry farms. The students expected some practical experiences of prepare farm planning and formulate balanced ration for livestock and poultry, and pets. So, when the animal owners seek farm planning, balanced ration, and diet chart for livestock, poultry, or pets, the placement providers should involve the students in this work as much as possible.

This study confirms that the majority of the students had enough opportunities to participate in a variety of extension activities during WBL, like different training sessions and several campaigns, especially at UVH placement. In addition to actively participating in various vaccination and deworming campaigns for livestock, pets, and birds, they had the opportunity to plan and execute various training programmes for dairy and poultry farmers. In these training programmes, organized in collaboration with the UVH authorities, the students had the opportunity to impart training to the farmers on various topics including farm management, the importance of regular vaccination, beef fattening, biosecurity, etc. Another important task assigned by the faculty for the students is to conduct school kid programmes. Most of the students were able to complete this

successfully where they had the opportunity to discuss various issues with the primary and secondary students, such as the nutritional value of meat, milk, and egg; zoonotic diseases and precautions; veterinary profession as a career choice and so on.

### 5.2. Structure and elements of work-based learning:

#### 5.2.1. Placements:

Among the off-campus clinical placements (UVH, CVH, zoo, RV&F Depo, live cattle market and TANUVAS), UVH and TANUVAS (VCRI and MVC) were recognized as the best workplaces by most of the students. Throughout the WBL period, students spend the longest time in these two placements (60 days in UVH and 30 days in TANUVAS), which gives them sufficient time to adapt to the new environment and work consistently in these placements for prolonged periods of time. This finding is far below that observed by Charles (2018), who reported that spending longer duration in a certain practice (e.g. Foster practice) enables the learners to gain a continuous core of experience in a familiar practice environment and maximize the allotted time by avoiding the introductory period at each new placement. This result resembles the finding of Samad and Islam (2016), who identified VCRI (TANUVAS) as the best placement for BAU students; though UVH had a much lower rank, because of the inadequacy of clinical cases, poor infrastructure, and varying degree of assistance from the placement providers. UVHs, without modern diagnostic facilities, are located at sub-district level of the country and the majority of clinical cases are from marginal livestock farmers. With the sincere cooperation of the placement providers and staff at UVH, students get acquainted with the appropriate means of communication with mostly rural clients or farmers and have the opportunities to learn about the best veterinary practices when using limited resources at UVHs. Here, students have sufficient opportunities to observe, assist and be directly involved with common clinical and surgical procedures; make draft prescriptions and administer drugs; visit production farms, and take part in several extension activities such as vaccination and deworming campaign for livestock and poultry, farmers training programme and school kid programme.

In TANUVAS, students usually get exposure to a larger number of clinical and surgical cases of pet animals in comparison to farm animals. In addition to being made aware of the various updated diagnostic and treatment strategies in the veterinary field, students are able to gain a thorough understanding of the use and application of different laboratory equipment in TANUVAS. Similarly, in a previous study, Charles (2018) also identified the hallmarks of beneficial placements as cooperative placement providers and associated staff, abundant caseloads, and allowing students to be directly involved with clinical cases.

Central Veterinary Hospital and National Zoo are considered as good clinical placements, but because of shorter rotation at CVH (7 days) and National Zoo (3 days), excessive workload of duty veterinarians dealing with huge number of clinical cases and year-round supervision of interns from different veterinary schools of Bangladesh, the duty veterinarians do not have sufficient time to teach students. Therefore, the learning opportunities in these placements were reported as unsatisfactory in the survey and FGDs which are supported by Samad (2016).

Though private veterinary clinics equipped with modern diagnostic techniques are the primary target for WBL placements in other countries (Kopcha et al., 2005, Fuentealba et al 2008, Bell et al., 2010, Tyner et al., 2014, Irons et al., 2017) no such placements are considered for CVASU students as there are only a few established private clinics in Bangladesh. However, clinical practices could be useful placements for students as reported by the study participants in both the survey and FGDs. Working at private veterinary clinics during the internship may encourage students to consider private practice as a career opportunity in the future, which is important as the job market for newly graduated veterinarians is highly competitive.

The students' involvement with veterinary ambulatory service in the field during internship period would be useful for developing clinical skills which is in-line with the findings of Kopcha et al., (2005) and Hedge et al., (2018). But there are no such facilities in the field. In this case CVASU ambulatory services used for 3$^{rd}$ and 4$^{th}$ year veterinary students can be used for interns during in-campus rotation.

As the wildlife sector is rapidly developing in Bangladesh (Debnath, 2006), the study participants suggested increasing the focus on this area by allocating more time and by identifying suitable WBL placements for students to develop necessary clinical skills.

Different government and private dairy farms, RV&FC, and several commercial poultry and breeder farms comprise the production placements of WBL at CVASU. Unlike several veterinary schools in the European region, the 'foster' system where students are allocated to one practice for much of their WBL and return repeatedly over several years, is still not practiced here (Charles, 2018). Students usually get a maximum of one to two working days on average at a government-run farm in Dhaka (CCB&DF) and several privately-owned dairy farms (7 to 10 farms) in Chattogram. In these placements, students can observe the overall management practices, rations, production status, disease occurrences, biosecurity practices as well as other common aspects of the dairy farms. Among the production placements, the longest duration allotted at the RV&FCs, is around 15 to 30 days. These large-scale farms are established and operated directly by the Bangladesh Army, as a result, almost all modern scientific farming strategies are practiced here, which are often absent in other government and private dairy farms. In addition to learning in detail about many updated practices of farm management and treatment, students have the opportunity to gain deep knowledge about milk storage and processing methods, as well as the production of different types of dairy products in the milk processing plant of RVFC. On the contrary, the unanticipated finding was that students didn't have sufficient opportunities to work in the poultry farms. Outsiders are not usually authorized to visit commercial poultry and breeder farms because of reserved access and strict biosecurity, which prevents students from having working opportunities there. But it is vitally important for students to spend a certain period of time in poultry farms and familiarize themselves with all the approaches taken from the beginning to the end of farming, including housing, brooding, rations, farm management, treatment, and even marketing of final products. This indispensable opportunity must be provided for the learners.

Chattogram Veterinary and Animal Sciences University students get the opportunity to visit Bangladesh Livestock Research Institute (BLRI), Central Disease Investigation

Laboratory (CDIL), and sometimes in the manufacturing plant of different pharmaceutical industries for a short period of time (1 day) as part of their laboratory-based WBL placements. Similarly, Bren (2001) also mentioned about internships and clerkships for veterinary students in USA at specialized laboratory-based placement, like the Food and Drug Administration's Center for Veterinary Medicine. At BLRI and CDIL, CVASU students observe hi-tech equipment at different laboratory units and the lab supervisor describe the uses and applications of the machineries. They witnessed different microscopic slide preparation, blood and milk analysis, polymerase Chain Reaction (PCR) procedure, use of different rapid test kits (e.g. Avian Influenza), etc. Besides, they had sufficient opportunities to observe and learn the postmortem of poultry. However, the short-term allocation slot for these valuable placements hinders the opportunity for students to develop desired hands-on laboratory skills. Students sometimes get a chance to visit manufacturing plants of various pharmaceutical industries during WBL. However, WBL opportunities at aforementioned placements are very limited and Samad and Islam (2016) and Debnath (2006) previously identified similar limitations.

In the existing placements, they do not get the opportunity of direct involvement with laboratory activities. The faculty should provide more working opportunities at the research-based institutions during WBL, where the students can experience basic research activities and be involved directly in common laboratory activities.

As described earlier UVH is the most important placement of CVASU WBL where students have the most opportunities to work and learn, and this placement is determined by the student's hometown. Each student is assigned to work alone as an intern doctor under the supervision of the Veterinary Surgeon (VS) and Upazila Livestock Officer (ULO) at UVH in their own Upazillas for about two months. But sometimes it is noticed that there is a lack of adequate work and learning opportunities in certain UVHs. Some of the main factors identified for these variabilities are geographical location, absence of a VS or ULO, lack of diagnostic and medical equipment, inadequate patients, and others. An earlier study of Samad and Islam (2016) also observed lower opportunity in certain UVHs due to inadequate clinical cases and diagnostic facility, less scope for hands-on involvement, improper supervision by placement providers, and so on. Students who are

assigned to such placements do not get sufficient opportunity to gain proper knowledge through practice-based activities as compared to other students. Therefore, the faculty should assign the students to the placements where there are cooperative placement providers and a conducive learning environment. A previous study suggested not to constrain the students' future wide-ranging job opportunities by assigning them to workplaces during WBL based on their home region only (Charles, 2018). However, convenient accommodation and travelling facility for students should also be considered before sending them to a workplace far from their home town.

In many veterinary schools in different parts of the world, DVM students have to arrange the workplaces themselves during the WBL period or are given time to work in an elective workplace of their choice (Baguley, 2006; Irons et al., 2017; Hoque and Anwer, 2018; Charles, 2018). A one-month open option is part of the current WBL curriculum at CVASU where students can identify a placement of their choice and many take up this opportunity.

### 5.2.2. Duration and time frame

According to the responses of the study participants, the distribution of time allocated to different placements needs to be adjusted to some extent. For instance, the participants thought the existing time allocation for UVH, RV&FC, overseas placements and Zoo should be increased as these placements are known to offer better facilities and staff cooperation for WBL. Specifically i) UVHs have a sufficient number of patients daily, have cooperative veterinarians and staff, and have a conducive learning and working environment for the students; ii) RV&FC dairy farm is run on up to date scientific methods and the students have ample opportunity to practice hands-on with the efficient supervision and sincere cooperation of the Army personal there; iii) TANUVAS (India) were considered as the most important placements for the students to acquire extensive knowledge about different diagnostic and treatment strategies of pets as well as farm animals. In highly advanced veterinary hospitals at TANUVAS, KKU and UPM, students had the opportunity to learn and practice some of the diagnostic and medical procedures that were not easily accessible in the Bangladesh context. As might be expected, they are

very keen to have more days working there; iv) Though students get sufficient opportunity to practice on pets and livestock in TVH, many important aspects of wildlife management and treatment are often confined to textbooks only. Working with wildlife in zoos during WBL is the most important and effective opportunity for students to gain practical knowledge of wildlife. So, they expect to have the opportunity to work longer at the zoo with more practical involvement.

The current study suggests reducing time allocation for the placements like CVH, CDIL, LRI and in-campus laboratory rotations as these placements did not offer good working opportunities. In various Dhaka-based short placements, including CVH, LRI, and CDIL, stakeholders (especially students) highlighted some inconveniences and suggested reducing the number of working days. Some of the notable problems identified are the busy daily timetable of placement providers, the discontent of placement providers towards the faculty for various reasons, the non-cooperation attitude of the staff, overcrowding of students from different veterinary schools throughout the year, accommodation problem, distance from one workplace to another, etc. Charles (2018), also noted variabilities of placements and difficulty in developing relationships between students and placement providers during short placements, which creates an environment of non-cooperation, resulting in a disruption in students' learning. Since these placements are government institutions and are the most likely potential workplaces for a professional career of DVM graduates, the faculty should take necessary measures to strengthen the relationship with the corresponding placement providers and resolve the identified problems as much as possible.

The dairy farm rotation is considered as one of the most important placements for WBL. But because of very short duration (one day) for covering multiple farms (7-10) students responded they were not able to get opportunity to learn the full management practices of those farms. The veterinary practice, where students spending more time at and repeatedly returning to the same, can be assimilated by them very well and in the long run. Therefore, if students are given the opportunity to work for a longer period on a well-organized dairy farm instead of working at multiple farms, then students' learning and practice will be more effective.

### 5.2.3. Faculty – placement collaboration

One of the most obvious findings to emerge from the analysis of survey and FGD results is that there was a conducive and favorable learning environment for students at most workplaces during WBL. It has been noted that the placement providers and associated staff were supportive and considerate towards students at workplaces, which promoted their learning and helped them adapt to a new environment. Even then, some impediments have been identified. In certain workplaces, placement providers are too busy with clinical patients and have to carry out other administrative responsibilities as well, so they are often unable to set aside enough time to teach students in the midst of their busy schedules. Charles (2018) noted that one of the hallmarks of a good placement is the opportunity for discussions between students and placement providers about clinical cases in the hospital. There are also some workplaces, where the placement providers show a somewhat non-cooperative attitude towards students due to inconsistent treatment by the university at different times. Some of the significant issues include: i) a lack of direct communication with the placement providers by the faculty before sending the students and infrequent or no communication during the rotation, ii) confusion and implications of providing monetary incentives, and iii) ineffective and irregular monitoring of students' activities, and the lack of a proper feedback strategy. Undoubtedly, the faculty's relationship with the placement providers influences the whole WBL. Prior study of Baguley (2006) has noted the value of regular communication between Faculty and placement providers helped ensure the optimum working opportunities for learners. Therefore, it is the responsibility of the faculty to strengthen the relationship with them and arrange for appropriate remuneration for their time and effort.

### 5.2.4. Faculty-student coordination

Prior to sending students to workplaces, an initial briefing by the Dean or Director of External Affairs or both, and detailed discussion with the students on the learning objectives of each placement was noted as very helpful. Through this, students can gain a comprehensive idea of the new workplace environment, their do's and don'ts, code of conduct with placement providers, and potential challenges. Again, there is always a feedback session between students and the coordinator at the end of each placement on the

overall experiences of students. Although these sessions were cited as being effective, attention was also drawn to occasional inappropriate evaluation and only partial application of the feedback findings. Börchers et al. (2010) found similar results in a previous study that feedback is not considered seriously and is often confined to the ledger. Regular feedback from all stakeholders involved in WBL, including students, needs to be received, reviewed, and proper implementation ensured.

In the form of the National DVM Intern Research Conference (NDIRC) held in the previous years, almost all the stakeholders requested that a similar scientific conference be held in the coming years. This is an excellent opportunity for students to portray the overall activities throughout the WBL period in front of DVM students of other institutes, faculty and veterinary professionals of the country. Additionally, students are able to present the results of their research projects (as part of their clinical and production reports) to a large scientific community from home and abroad. Other functional events, such as job fairs will pave the way for students to enter their professional life, additionally, it will improve the relationship between the faculty and placement providers.

### 5.3. Challenges

#### 5.3.1. Challenges for students

A further significant finding of this study indicates that through the WBL, students had been able to build their self-confidence and professionalism by working in the real workplace, which helped prepared them for a competent career. This is consistent with the findings of several previous studies (Debnath, 2006; Marr, 2016; Charles, 2018; Hedge, 2018; Hoque and Anwer, 2018; Loeb, 2018), who also identified the positive impact of WBL on students' professional skills, which provide them with real experiences beyond the university premises. Some students also reported receiving job offers from placement providers, which is congruent with another recent study (Charles, 2018). However, the study also demonstrated certain challenges and obstacles faced by students while moving beyond the familiar boundaries of the university to work in the new environment, such as travel, accommodation, learning to adapt, cooperation from placement providers, water and linguistic problem in overseas placements, and so on.

During WBL, students encountered challenges associated with their travel and accommodation at some placements. Previously, Debnath (2006) identified accommodation as an acute problem for CVASU students. Charles (2018) and Baguley (2016) also reported similar findings that related to financial issues. In the Dhaka based rotation, all students are assigned to the different placements in small groups for over a month and the placements are far away from one other in traffic jam packed crowded Dhaka city. Most students did not have any fixed place for their stay in Dhaka, so were worried the whole time, especially for girls who had a lot of trouble finding safe accommodation. They reported having no support from the faculty in the arranging accommodation. As the placements are scattered in different parts of the city, the regular commuting of students by local transports in such a busy city is a serious problem. Meanwhile, when students are being deployed in different dairy farms in Chattogram, they were instructed to observe the entire daily activities of the farm by being present there in the early hours of the day, and at that time, it was very difficult for them to get to the farm at the right time early in the morning from the CVASU students' residence. The faculty needs to be more proactive in solving these serious issues of students. If proper accommodation and transportation can be provided for students in Chattogram and Dhaka, their difficulties in different workplaces far and wide could be reduced.

Adapting to a new environment while working with unfamiliar people in a completely new workplace is a really tough challenge for students. This corroborates with the findings of Baguley (2016), who identified adapting to the pace of the clinical workplace as one of the challenges for students at extramural placements. Students notice a wide range of variations in client attitudes, veterinarians' diagnostic strategies, treatment protocol, and overall working environment compared to their university and TVH, and they struggle to cope with all these. Students repeatedly mentioned being very concerned about keeping pace with the placement providers and associated staff in workplaces. In some workplaces, students did not get the expected cooperation from placement providers which caused significant interruption in their learning and practice. Previous studies by Charles (2018) and Scholz et al. (2013) noted that students' learning during WBL greatly depends on the attitude and willingness of the placement providers. Although the busy schedule of the placement providers is the most significant reason behind the inadequate cooperation for

students, in a few placements, students didn't get optimum support from the placement providers due to the issues around providing monetary incentives. In a few workplaces, it was reported that students have opportunities to only observe the activities, but no adequate opportunities for active involvement. Different restrictions, distrust in the capabilities and competencies of the students, and some other circumstantial factors also limited the opportunities. Other minor factors include inadequate communication between faculty and placement providers, associated staff perceiving students as competitors, and lack of adequate diagnostic and treatment facilities in the hospital. These findings broadly support the previous studies (Debnath, 2006; Lemanski, 2011), which identified factors that limited student opportunities as poor collaboration between faculty and placement providers, hectic schedule busyness of placement providers, and insufficient facilities at placements. In addition to building strong relationships between faculty and placement providers, the faculty should encourage students to face the challenges in the workplace with their prudence and competencies and highlight the importance of actively seeking out learning opportunities while at a placement.

The skills of effective communication with co-workers and clients, and the mastery of various treatment protocols at the field level were identified as the greatest achievement for the students. These match the observations in an earlier study (Baguley 2006). Yet, in certain areas, students desire more opportunities, like performing surgery and postmortem, and dealing with ophthalmology cases. These results align with the work of Charles (2018) and Debnath (2006) to some extent, who also found students' desire for more surgical skills along with other 'Day one competencies’. Placement providers should give students the opportunity to witness, assist, and be involved in different surgeries as much as possible. Students should also express their interest to be involved to the veterinarians whenever there are postmortem cases and the veterinarian can provide them with the experience

### 5.3.2. Challenges for the faculty

This study found that the university's reputation and recognition have been spread across the country and abroad as a result of the promising performances of students in various institutions during the WBL, which in turn helps graduates get jobs in better places. This

is in accordance with the previous finding of Samad and Islam (2016). However, faculty have to deal with a variety of challenges while managing the WBL programme over the long period of one year. Notable among these are preparing the students and arranging accommodation, managing placements and meeting expectations of the placement providers, and a lack of manpower in the coordination team.

It is an arduous task for the faculty to brief the students about the overall environment before sending them to each workplace, notify them about the potential challenges, advise on their code of conduct to the placement providers, explain the learning objectives and responsibilities in the placement and finally taking feedback after completion of each placement. Students often encounter problems while working in the workplace, and contact the faculty for instructions and solutions. It is challenging enough for the faculty to be informed about all sorts of troubles faced by the students and take effective action in time. Furthermore, arranging safe accommodation for every student during their stay at off-campus placements is a very challenging task for the faculty, as every student is assigned in different places around the country at the same time. Hoque and Anwer (2018) showed their concerns regarding this in their previous study as well. The Director of External Affairs (WBL coordinator) always has to be concerned about the safe accommodation of the students, especially the girls, because during the WBL period the safety of every student is the prime responsibility of the faculty.

In line with earlier studies (Bell et al., 2010; Charles, 2018; Hoque and Anwer, 2018), arranging placements for veterinary WBL was pointed out as an important but also challenging issue. Although, WBL placements are usually arranged by students themselves in the UK (Bell et al., 2010), here in CVASU, the faculty primarily perform this difficult task. Since CVASU sends its students to work in various government institutions, it is difficult to arrange work permits for students as apprentices in these institutions. To provide students with internship opportunities in certain highly restricted areas for weeks, such as military operated RV&FC and RV&F Depo, the faculty had to deal with a lot of challenges. In many cases, access to several high bio-secured commercial poultry and breeder farms is restricted, therefore faculty sometimes failed to arrange such opportunities for students. Furthermore, while sending students to overseas

institutions as part of WBL, the faculty has to put a lot of effort into many ancillary issues, including ensuring maximum safety for all, arranging comfortable travel and safe accommodation, and strengthening the relationship with the institution to maximize the learning environment. Additionally, students are assigned to work in more than 30 UVHs across the country, as it is determined based on their home town, and ten different dairy farms as well as several poultry farms. In more than ten institutions in the country and a few abroad, sometimes students work in groups and occasionally alone. In most workplaces, they often have to work under more than one supervisor. So, the faculty has to keep in touch with this large number of placement providers throughout the WBL programme to ensure a conducive learning environment for the students, which is undoubtedly a difficult task. In the meantime, the faculty has to deal with various complaints from both the students and the placement providers. Placement providers again raise various expectations including monetary incentives for their time and other privileges from the university, like being invited to conferences and training programmes, being assigned as an examiner, etc. Overall, the faculty has to go through a variety of hassles and challenges throughout the course of running the WBL programme.

The WBL coordination committee of CVASU consists of a very small team that is supervised by the Director of External Affairs, who has to face a lot of trouble managing this extensive programme. A manpower rich skilled and independent team should be deployed to successfully run this compound and long-term WBL programme.

### 5.3.3. Challenges for the placement providers

Consistent with the finding of previous reports (Latham 2001, Mahoney et al., 2011), this study recognized WBL as an opportunity for mutual knowledge sharing between students and placement providers. However, as every veterinarian is busy with both administrative and clinical matters, placement providers reported difficulties in being able to set aside enough time to spend with the students. This agrees with the observation of Mahoney et al., (2011). Veterinarians have to deal with the patient uninterruptedly and perform the clinical procedures swiftly, so they often don't get extra space or time to discuss the clinical case in detail with the students. Occasionally, the veterinary surgeon at the UVH runs an ambulatory service and visits different dairy and poultry farms to provide

veterinary care and advice in farm management. Even though they want to take the students with them to provide practical exposures, it is not always feasible because of inadequate transportation facilities. In some placements, such as zoo and CDIL, sometimes students from different veterinary schools come for WBL at the same time, which creates overcrowding, making it difficult for placement providers to impart knowledge equally to all. As mentioned earlier, complaints have also been raised that students are not assigned for sufficient duration in some workplaces, making it impossible for the placement providers to provide students with an overall knowledge of the entire workplace in a short period of time.

The study also found that placement providers sometimes identified students as inattentive, unaccountable, and unenthusiastic to work. In addition to some students were arriving late for work, while a few are inclined to leave before the end of the working day. According to Wareing (2015), students at workplaces must involve themselves with as wide a range of work as possible in order to derive sufficient breadth of learning from their experience. Inadequate monitoring of the activities of the students by the university is known to be the prime cause of their unprofessional behaviors in placements. On the other hand, the placement providers are rarely contacted by the faculty to inquire about the overall progress and performance of students in most of the placements. There is scarcely any formal approach to get feedback from the placement providers as part of the follow up of the WBL programme. These create a gap in their relationship with the faculty, which eventually affects students' learning. It is imperative for the faculty to set up a strong group for constant supervision and monitoring of student activities at off-campus placements.

# Chapter-6: Conclusion and Recommendations

1) Along with the opportunities to observe and assist with clinical cases and communicate with clients, it is important to ensure sufficient opportunities for every student to be directly involved and perform clinical procedures on a variety of clinical cases in a real workplace environment, as it is a crucial period to prepare for independent working in upcoming professional life. Students should at least be given the opportunity to directly involve in minor surgical procedures, such as castration, wound management, abscess correction, and in case of major surgeries they might be given the access to observe and assist with the procedures or monitor the anesthesia, etc. which will further develop their competencies.

2) Regular communication and building strong relationships between faculty and placement providers are the main driven forces of students' opportunities in the out-campus placements. To improve communication and develop a more functional regular year-around relationship CVASU should invite placement providers to different events such as meetings, workshops, conferences, external examiner, online or off-line continuous education programmes. These activities could help motivate placement providers to be more strongly involved with the CVASU WBL programme.

3) Private Veterinary Clinic is one of the most efficient workplaces for students to learn about various practical matters on the field level. Special mention should be made of the client handling approaches, diagnosis, treatment and management of reproductive diseases of pets, different diagnostic and laboratory tests, general anesthesia, writing health and soundness certificate and so on. Students, as in other countries around the world, increasingly need to be provided with the working opportunities in various well-equipped private veterinary clinics as intern doctors. The university must play a leading role in this placement arrangement and at the same time the students should try to find their own WBL opportunities in private veterinary clinics on their own initiative.

4) Some important practices students may not get the sufficient opportunity to perform at the field level during WBL, such as postmortem of pet and farm animals, dealing reproductive diseases and ophthalmology cases, general anesthesia, some important laboratory and diagnostic tests, etc. Chattogram Veterinary and Animal

Sciences University must provide opportunities for these important practices through the pathology department, unit of theriogenology, unit of surgery/TVH and CVASU's own animal farm.

The TVH should establish a manpower-rich, separate, and well-equipped theriogenology section for both farm animals and pet animals. The university should set up a farm where students will have more opportunities for hands-on learning on the reproductive problems of farm animals. In this context, the construction of a separate farm-based campus of the university is currently underway. The surgery unit on the main campus needs to be upgraded with more up-to-date and hi-tech modern medical and surgical equipment. In addition, proper utilization and regular application of existing equipment for orthopedic surgery, ophthalmology, dental treatment, physical therapy, and general anesthesia should be ensured.

It is essential to have a completely separate section for postmortem operated by Department of Pathology and postmortem should be performed on all types of birds and animals, that die in the hospital, with the active involvement of students. In addition to imparting practical knowledge to the students on proper collection, storage, and transportation of postmortem samples, it is very important to have proper clinical pathology laboratory facilities for confirmatory diagnosis at TVH. The university should have arrangements with zoos, safari parks, and wildlife sanctuaries in different parts of the country to bring dead wildlife to the TVH for postmortem. Above all, farmers and pet animal owners need to be made aware of the importance and benefits of a postmortem.

5) Job opportunities in the wildlife sector are increasing day by day for graduated veterinarians at home and abroad, and many students are eager to choose the wildlife sector as their future profession. In order to impart more practical knowledge to the students about wildlife, the university should arrange WBL opportunities for the students in different zoos, safari parks, wildlife sanctuaries, and wild animal farms across the country. In particular, by assigning small groups of students for a few days by rotation at the nearby Chattogram Zoo, they can be given the opportunity to involve with different practical activities, including wildlife management, housing, ration formulation, restraint, treatment, and so on. In addition, interested students can arrange WBL opportunities at

crocodile farms, snake farms, and other wildlife-related workplaces by themselves or with the help of faculty.

6) As a continuation of previous years, the approach of sending small groups of students to poultry and breeder farms with the intensive working facilities, should be re-introduced for DVM students in CVASU. It will definitely contribute significantly to the student's knowledge on poultry practice. Creating WBL opportunities for students in various government and private poultry farms will benefit them greatly in the professional field in the near future, along with their academic knowledge.

7) It is very important to further increase the WBL opportunities of the students in the research-based workplace. The university should play a more effective role in creating WBL opportunities for the students to participate in more intensive and proactive research activities in various renowned research institutions across the country, including IEDCR, ICDDRB, BLRI, etc. These institutes can make a significant contribution in imparting practical knowledge to the students on various epidemiological and veterinary public health researches along with different sophisticated laboratory and diagnostic tests.

8) Regular discussion and feedback from all involved stakeholders in this dynamic and interdependent programme are vitally important. The faculty should provide a well-structured feedback form for students to evaluate each placement and then critically analyze the students' opportunities and challenges and act as appropriate. In addition, it is crucial to arrange regular constructive feedback sessions between the faculty and placement providers, whether in a face-to-face or in an online meeting, so that the faculty can be aware of the attitudes and expectations of the placement providers, and the placement providers will also be able to share their experiences of working with the students.

9) Since almost all the students have to stay in Dhaka for a certain period of time around the year, it would be helpful if the university could arrange a permanent residential facility for the students there. One option, involving the concerted efforts of all the veterinary schools of the country, would be a permanent arrangement established in the center of Dhaka where students of all the institutes will be able to stay during their off-campus internship placements in the city. This idea was also discussed in Bangladesh

Dean Council meeting in CVASU (Prof Md. Ahasanul Hoque, Personal Communication 2019).

10) It is vital to deploy more manpower to run this huge and long-term WBL programme with an increasing number of students. A competent and sufficiently large WBL team should be formed with academics and non-academic (administrative) staff who will be responsible for arranging work placements, regularly and effectively monitoring the activities of the students in different workplaces during WBL and maintaining a good level of communication with placement providers. The WBL team may occasionally appear at the workplace without prior announcements to perceive the working environment, which will certainly deepen the relationship between faculty and placement providers and will inspire the students. The faculty members, who were assigned to supervise each of the student's research reports, can play an important role in continuously guiding their activities over the period.

11) Building on the success of previous scientific conferences held over the years, the university should continue to organize such events where students will get a worthy platform to share their experiences of WBL. In addition, they will have the opportunity to present their research findings/WBL experiences at the undergraduate level in front of scientists/practitioners from home and abroad.

As students will be starting their professional careers in the near future, the faculty could organize job fairs, which could become part of the intern conference, with the participation of employers of different institutions towards the ending stage of students' undergraduate study. It will facilitate the students in seeking and enrolling in the preferred job, while the employers will have the occasion to recruit qualified new graduates as per their expectations. Over and above, it will also reinforce the relationship between faculty and placement providers.

**Future direction of research:**

- Identify the mechanism/tool on how to increase relationship with field placement providers for the better WBL programme in Bangladesh.
- Establish an online resource containing details about the internship and WBL programme of CVASU including objectives, structures, placements, activities, pictorial documents, students' achievements, placement providers' feedback, and so on.
- Develop an online database or application to receive and assess activity updates and feedbacks from students during WBL.
- By exploring, reviewing, and analyzing every challenge faced by the students in the workplace at home and abroad separately, identify the most effective way to overcome and ensure implementation.
- After completion of the internship by each batch in CVASU, publish the overall activities and reviews on WBL at national and international veterinary educational journal yearly.
- The findings of this study should be evaluated carefully and the proposed recommendations should be prioritized and implemented, and subsequently, another extended study should be designed to assess the impact of those change/s e.g. on student learning, placement provider, and student satisfaction, etc.

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# Appendix-I

## A survey of work-based learning of veterinary interns at different extra-mural national and international places

- This survey is part of an international project led by CVASU on work-based learning of veterinary interns.
- The goal of this survey is to get your feedback in order to optimize work-based learning for veterinary interns.
- The project is funded by a grant from the Association of American Veterinary Medical Colleges (AAVMC)'s Council for International Veterinary Medical Education (CIVME).
- The project has received approval from CVASU Ethics Committee. Your time completing the survey is appreciated.
- **This survey is anonymous and so, do not write your name or include any identifying notation.**

## General directions for taking the survey:

- In the survey you will be asked about whether you had 'sufficient opportunities to...' In this context, we are seeking feedback on whether you had 'sufficient opportunities' to learn the things that you were expected to learn on your placements.

- In the survey you will be asked for your opinion on a series of statements about your recent work-based learning. You can respond by selecting one of the following categories:

    1. Strongly disagree (SD)
    2. Disagree (DA)
    3. Neutral (NE)
    4. Agree (AG)
    5. Strongly Agree (SA)
    6. Didn't do this (DN)

- After each section there is a question 'Any comments on the above section:' where you can enter comments

Please use a tick mark (√) to show your choice in the appropriate box.

1. **During the clinical placements (UVH, CVH, TANUVAS):**

| SN | Skills | 1=SD | 2=DA | 3=NE | 4=AG | 5=SA | 6=DN |
|---|---|---|---|---|---|---|---|
| **1.1** | **Production animal** | | | | | | |
| 1.1.1 | I had sufficient opportunities to observe clinical cases | | | | | | |
| 1.1.2 | I had sufficient opportunities to assist with clinical cases | | | | | | |
| 1.1.3 | I had sufficient opportunities to directly handle animals and perform procedures (e.g. clinical examination, diagnosis and drug prescription) | | | | | | |
| 1.1.4 | Across all the placements I attended, there were enough production animal cases for me to learn | | | | | | |
| 1.1.5 | *Any comment on the above section* | | | | | | |
| **1.2** | **Pet animal** | | | | | | |
| 1.2.1 | I had sufficient opportunities to observe clinical cases | | | | | | |
| 1.2.2 | I had sufficient opportunities to assist with clinical cases | | | | | | |
| 1.2.3 | I had sufficient opportunities to directly handle pet animals and perform procedures (e.g. clinical examination, diagnosis and drug prescription) | | | | | | |
| 1.2.4 | Across all the placements I attended, there were enough pet animal cases for me to learn | | | | | | |
| 1.2.5 | *Any comments on the above section* | | | | | | |

2. **Opportunities to develop the following skills by working at different clinical and production placements**

| SN | Skills | 1=SD | 2=DA | 3=NE | 4=AG | 5=SA | 6=DN |
|---|---|---|---|---|---|---|---|
| **2.1** | **Communication** | | | | | | |
| 2.1.1 | I had sufficient opportunities to communicate with food animal farmers in the placements | | | | | | |
| 2.1.2 | I had sufficient opportunities to communicate with pet animal owners in the placements | | | | | | |
| 2.1.3 | *Any comments on the above section* | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **2.2** | **Clinical examination of food animal: While on placement I had sufficient opportunities to** | | | | | | |
| 2.2.1 | Record temperature, heart rate, pulse rate | | | | | | |
| 2.2.2 | Assess lung and heart sound | | | | | | |
| 2.2.3 | Palpate the liver, lymph node etc. | | | | | | |
| 2.2.4 | Determine ruminal motility | | | | | | |
| 2.2.5 | Evaluate hydration/dehydration level | | | | | | |
| 2.2.6 | Perform rectal palpation | | | | | | |
| 2.2.7 | Perform pregnancy diagnosis | | | | | | |
| 2.2.8 | *Any comments on the above section* | | | | | | |
| **2.3** | **Clinical examination of pet animal : While on placement I had sufficient opportunities to** | | | | | | |
| 2.3.1 | Record temperature, heart rate, pulse rate, blood pressure | | | | | | |
| 2.3.2 | Assess lung and heart sound | | | | | | |
| 2.3.3 | Palpate the abdomen e.g. intestine, liver, kidney, lymph node | | | | | | |
| 2.3.4 | Evaluate hydration/dehydration level | | | | | | |
| 2.3.5 | Perform pregnancy diagnosis | | | | | | |
| 2.3.6 | *Any comments on the above section* | | | | | | |
| **2.4** | **Diagnostic specimens of food animals: While on placement I had sufficient opportunities to** | | | | | | |
| 2.4.1 | Collect blood samples from different sites (jugular vein/cephalic vein/saphenous vein) | | | | | | |
| 2.4.2 | Collect and process skin scraping | | | | | | |
| 2.4.3 | Collect and preserve post-mortem specimens | | | | | | |
| 2.4.4 | Collect ruminal fluid | | | | | | |
| 2.4.5 | *Any comments on the above section* | | | | | | |
| **2.5** | **Diagnostic specimens of pet animals: While on placement I had sufficient opportunities to** | | | | | | |
| 2.5.1 | Collect blood samples from different sites (jugular vein/cephalic vein/saphenous vein/direct heart) | | | | | | |
| 2.5.2 | Collect and process skin scraping | | | | | | |
| 2.5.3 | Collect and preserve post-mortem specimens | | | | | | |
| 2.5.4 | *Any comments on the above section* | | | | | | |
| **2.6** | **Injection and Infusion of food animals: While on placement I had sufficient opportunities to** | | | | | | |
| 2.6.1 | Inject or infuse SC injection or fluid | | | | | | |
| 2.6.2 | Inject or infuse IM injection or fluid | | | | | | |
| 2.6.3 | Inject or infuse IV injection or fluid | | | | | | |
| 2.6.4 | Place IV catheter | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2.6.5 | Inject subconjunctival injection | | | | | | |
| 2.6.6 | Perform intra-mammary infusion | | | | | | |
| 2.6.7 | Perform local anesthesia | | | | | | |
| 2.6.8 | Perform general anesthesia | | | | | | |
| 2.6.9 | Perform artificial insemination | | | | | | |
| 2.6.10 | *Any comments on the above section* | | | | | | |
| **2.7** | **Injection and Infusion of pet animals: While on placement I had sufficient opportunities to** | | | | | | |
| 2.7.1 | Inject or infuse SC injection or fluid | | | | | | |
| 2.7.2 | Inject or infuse IM injection or fluid | | | | | | |
| 2.7.3 | Inject or infuse IV injection or fluid | | | | | | |
| 2.7.4 | Place IV catheter | | | | | | |
| 2.7.5 | Inject subconjunctival injection | | | | | | |
| 2.7.6 | Perform local anesthesia | | | | | | |
| 2.7.7 | Perform general anesthesia | | | | | | |
| 2.7.8 | *Any comments on the above section* | | | | | | |
| **2.8** | **Laboratory skills: While on placement I had sufficient opportunities to** | | | | | | |
| 2.8.1 | Perform coproscopy and able to identify parasites and their eggs accurately | | | | | | |
| 2.8.2 | Perform skin scraping test to identify specific ecto-parasites | | | | | | |
| 2.8.3 | Perform California Mastitis test (CMT) | | | | | | |
| 2.8.4 | Perform routine blood test and interpret the results | | | | | | |
| 2.8.5 | Perform different smears, stain and examine under a microscope | | | | | | |
| 2.8.6 | Evaluate rumen fluid in order to assess the activities of rumen flora | | | | | | |
| 2.8.7 | Perform semen motility testing | | | | | | |
| 2.8.8 | Perform vaginal cytology testing | | | | | | |
| 2.8.9 | Perform fluorescent dye test and interpret the results | | | | | | |
| 2.8.10 | Perform Schirmer strip tear test and interpret the result | | | | | | |
| 2.8.11 | Perform ophthalmoscopy | | | | | | |
| 2.8.12 | Perform tono-pen test and interpret the result | | | | | | |
| 2.8.13 | Perform x-ray and interpret the report | | | | | | |
| 2.8.14 | Perform and interpret Ultrasonography | | | | | | |
| 2.8.15 | *Any comments on the above section* | | | | | | |
| **2.9** | **Post-mortem: While on placement I had sufficient opportunities to** | | | | | | |
| 2.9.1 | Perform poultry post-mortem | | | | | | |
| 2.9.2 | Perform small ruminant post-mortem | | | | | | |
| 2.9.3 | Perform large ruminant post-mortem | | | | | | |
| 2.9.4 | Perform pet animal post-mortem | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2.9.5 | Perform pet bird post-mortem | | | | | | |
| 2.9.6 | Perform wild animal post-mortem | | | | | | |
| 2.9.7 | *Any comments on the above section* | | | | | | |
| **2.10** | **Diseases of food animal: While on placement I had sufficient opportunities to** | | | | | | |
| 2.10.1 | Assist with common clinical cases: e.g. abscess, acidosis, bloat, dog bite, diarrhea, myiasis, navel ill, keratoconjunctivitis etc. | | | | | | |
| 2.10.2 | Assist with common surgical cases: e.g. atresia ani, gid disease, castration, hernia, spaying, urolithiasis etc. | | | | | | |
| 2.10.3 | Assist with common orthopedic cases: e.g. different fracture, upward patellar fixation | | | | | | |
| 2.10.4 | Assist with common reproductive cases: e.g. assisted delivery, repeat breeding, retained placenta, uterine prolapse, vaginal prolapse, cesarean operation, etc. | | | | | | |
| 2.10.5 | *Any comments on the above section* | | | | | | |
| **2.11** | **Diseases of pet animal: While on placement I had sufficient opportunities to** | | | | | | |
| 2.11.1 | Assist with common clinical cases: e.g. abscess, acidosis, bloat, dog bite, diarrhea, myiasis, navel ill, keratoconjunctivitis, parvo viral enteritis, feline panleukopenia etc. | | | | | | |
| 2.11.2 | Assist with common surgical cases: e.g. castration, spaying, docking etc. | | | | | | |
| 2.11.3 | Assist with common orthopedic cases: e.g. different fracture, intramedullary pinning, urolithiasis | | | | | | |
| 2.11.4 | Assist with common reproductive cases: e.g. cesarean operation | | | | | | |
| 2.11.5 | *Any comments on the above section* | | | | | | |
| **2.12** | **Drug prescription: While on placement I had sufficient opportunities to** | | | | | | |
| 2.12.1 | Write a drug prescription for poultry | | | | | | |
| 2.12.2 | Write a drug prescription for small ruminant | | | | | | |
| 2.12.3 | Write a drug prescription for large ruminants/large animal | | | | | | |
| 2.12.4 | Write a drug prescription for pet animal | | | | | | |
| 2.12.5 | Write a drug prescription for pet bird | | | | | | |
| 2.12.6 | Prescribe emergency lifesaving drugs for farm animals, pet animals, and birds | | | | | | |
| 2.12.7 | *Any comments on the above section* | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **2.13** | **Hospital data:<br>While on placement I had sufficient opportunities to** | | | | | | |
| 2.13.1 | Record and use clinico-epidemiological data to produce a report | | | | | | |
| 2.13.2 | Perform disease outbreak investigation | | | | | | |
| 2.13.3 | *Any comments on the above section* | | | | | | |
| **2.14** | **Certification:<br>While on placement I had sufficient opportunities to** | | | | | | |
| 2.14.1 | Write certificates e.g. dead/health/soundness | | | | | | |
| 2.14.2 | *Any comments on the above section* | | | | | | |
| **2.15** | **Vaccination and deworming programme: I had sufficient opportunities to plan and execute** | | | | | | |
| 2.15.1 | Vaccination programme for different livestock and poultry | | | | | | |
| 2.15.2 | Vaccination programme for pet animals and birds | | | | | | |
| 2.15.3 | Deworming programme for different livestock and poultry | | | | | | |
| 2.15.4 | Deworming programme for pet animals and bird | | | | | | |
| 2.15.5 | *Any comments on the above section* | | | | | | |
| **2.16** | **Other activities** | | | | | | |
| 2.16.1 | I had sufficient opportunities to prepare farm planning (cattle/goat/poultry) | | | | | | |
| 2.16.2 | I had sufficient opportunities to formulate balanced ration of livestock and poultry | | | | | | |
| 2.16.3 | I had opportunities to formulate diet chart for pet animals | | | | | | |
| 2.16.4 | I had sufficient opportunities to assess farm-hygiene and bio-security | | | | | | |
| 2.16.5 | I had sufficient opportunities to plan and execute different training programmes for livestock farmers | | | | | | |
| 2.16.6 | I had sufficient opportunities to conduct school kid programmes to build aware about zoonotic diseases among students and promote veterinary education and profession | | | | | | |
| 2.16.7 | *Any comments on the above section* | | | | | | |

3. **Overall, the duration of different rotations at different places was appropriate**
   1=SD 2=DA 3=AG 4=SA 5=NE 6=DN
   If any placements were too short, please list below:

   If any placements were too long, please list below:

4. **The intern log book was very useful in preparing me for the placements**
   1=SD 2=DA 3=NE 4=AG 5=SA
5. **The oral briefing in a group by dean and internship coordinator was very useful in preparing me for the placements**
   1=SD 2=DA 3=NE 4=AG 5=SA
6. **Internship coordinator having an initial conversation with the placement provider through phone call or a formal letter prior to sending me was very helpful for having the cooperation of the placement provider**.
   1=SD 2=DA 3=NE 4=AG 5=SA
7. **Providing learning objectives for each placement, other than prescribed generic objectives in intern logbook, from the internship coordinator and then revising the objectives with the consultation of the placement provider has been useful for structuring my learning.**
   1=SD 2=DA 3=NE 4=AG 5=SA
8. **The placement providers provided me with a conducive learning environment**
   1=SD 2=DA 3=NE 4=AG 5=SA
9. **The placement providers and associated staffs were helpful.**
   1=SD 2=DA 3=NE 4=AG 5=SA
10. **The Faculty should provide monetary incentive to the placement providers.**
    1=SD 2=DA 3=NE 4=AG 5=SA
11. **Placement supervisors tried to clear up any confusion I had during the placement.**
    1=SD 2=DA 3=NE 4=AG 5=SA
12. **Placement supervisors tried to clear up any confusion I had while working with patients.**
    1=SD 2=DA 3=NE 4=AG 5=SA
13. **The monthly allowance provided by the faculty during the internship/externship was sufficient for me.**
    1=SD 2=DA 3=NE 4=AG 5=SA
14. **Accommodation and travel were the major challenges for me for the placements.**
    1=SD 2=DA 3=NE 4=AG 5=SA

**14.1. If you disagree or strongly disagree what were the major challenges?**

15. **The placements are particularly useful for my learning as they deal with situations that come from the real world.**
    1=SD 2=DA 3=NE 4=AG 5=SA
16. **I have developed my professionalism working at different placements during the internship programme.**
    1=SD 2=DA 3=NE 4=AG 5=SA
17. **Completion of the fifth-year externship increased my level of confidence in dealing with production animal clinical cases in the field.**
    1=SD 2=DA 3=NE 4=AG 5=SA
18. **Completion of the fifth-year externship increased my level of confidence in dealing with pet animal clinical cases.**
    1=SD 2=DA 3=NE 4=AG 5=SA
19. **Clinical placements enhanced my skills for working with production animal clinical cases in the field.**
    1=SD 2=DA 3=NE 4=AG 5=SA
20. **Clinical placements enhanced my skills for working with pet animal clinical cases.**
    1=SD 2=DA 3=NE 4=AG 5=SA
21. **I feel better prepared to work in a clinical setting with production farm as a result of the fifth-year externship.**
    1=SD 2=DA 3=NE 4=AG 5=SA
22. **I feel better prepared to work in a clinical setting with pet animals as a result of the fifth-year externship.**
    1=SD 2=DA 3=NE 4=AG 5=SA
23. **Completion of fifth-year internship/externship experience gave me a better understanding of my future veterinary career options.**
    1=SD 2=DA 3=NE 4=AG 5=SA
24. **I've learned about the marketing chain of dairy products, poultry products, drugs, and other products in the livestock sector in Bangladesh.**
    1=SD 2=DA 3=NE 4=AG 5=SA
25. **Learning about current market situations of livestock and livestock products in Bangladesh has encouraged me to be an entrepreneur.**
    1=SD 2=DA 3=NE 4=AG 5=SA
26. **Faculty should provide me with a feedback form to rate each of the placements.**
    1=SD 2=DA 3=NE 4=AG 5=SA

*Any comments on the above section (Question 3-26)*

27. **I have received a job offer from one or more placement providers**
    1=Yes; 2=No
28. **What were the top 3 skills you learned on the placements? (please list below):**
    **28.1 28.2 28.3**
29. **Are there any key skills you feel you are not getting exposed to on placements? (please list below):**
30. **Overall, what were the best aspects of your placement experiences? (please list below):**

31. **Are there any other comments you would like to make that would help improve placements for future students?**

# Appendix-II

## Interview Guide of Focus Group Discussion

Optimizing work-based learning in veterinary undergraduate studies by identifying factors and issues that contribute to the experiences of students, placement providers and faculty

**Q1:**

What do you think are the main **benefits/advantages** of work-based placements / internship placements during one-year internship period?

**Q2:**

2A: In your opinion, what currently **makes/enables** the interns to get sufficient opportunities to be involved with clinical cases?

2B: In your opinion, what currently **prevents** the interns to get sufficient opportunities to be involved with clinical cases?

2C: What do you suggest would help **increase** the level of opportunities for future interns?

**Q3:**

3A: Most of the interns sufficiently performed **poultry PM** at different clinical placements, but they didn't perform any **PM of other species (like food animal, pet animals and zoo animals)**. Also, they did not collect, preserve and transport any PM specimens during the rotation.

a) What do you think are main reasons for this?
b) How would we create opportunities for future interns to get more exposure/opportunities to do PM in the future?

3B: Most of interns reported that they got little exposure to different **reproductive clinical cases** regardless of food and pet animals.

a) What do you think are main reasons for this?
b) How would we create opportunities for future interns to get more exposure/opportunities to do clinical reproductive cases in the future?

3C: Most interns felt necessity of working with **wild / zoo animals**, specially the management practiced at zoo along with diagnosis and treatment protocols, though they got minimum exposure.

a) What do you think are main reasons behind this?
b) How would we create opportunities for future interns to get more exposure/opportunities to do clinical reproductive cases in the future?

3D: Inters wanted to work in poultry **breeder farm and and feed mill**. But, there were less opportunities.

a) What do you think are main reasons behind this?

b) How would we create opportunities for future interns to get more exposure/opportunities to do clinical reproductive cases in the future?

3E**:** According to the survey responses almost all interns **missed practicing some desired activities** like IV catheter placement, general anesthesia, dealing ophthalmological cases and so on.

a) What do you think are main reasons for this?

b) How would we create opportunities for future interns to get more exposure/opportunities to do some/all of these cases/skills in the future?

3F: Writing **prescription** and **animal health certificate** in field condition is one of the important skills, but most of the interns did not have the opportunities.

a) What do you think are main reasons for this?
b) How would we create opportunities for future interns to get more exposure/opportunities to write these certificates in the future?

3G**:** Although interns reported having sufficient opportunities to perform clinical laboratory tests (e.g. blood test, smear, skin scrape etc.), they did not get enough opportunities in other **diagnostic areas (e.g. X-ray, ultrasonography)** i.e. to practice and interpret the findings.

a) What do you think are main reasons for this?
b) How would we create opportunities for future interns to get more exposure/opportunities to do X ray and/or ultrasound in the future?

3H: Interns had a very little exposure to **production farms** and got less opportunity to prepare balance ration and asses production parameters (Broiler, layer, sonali, goat, dairy farms).

a) What do you think are main reasons for this?
b) How would we create opportunities for future interns to get more exposure/opportunities to do X ray and/or ultrasound in the future?

**Q4:**

4A**:** The majority of interns did not feel that the **distribution and/or time allocation** for different internship placements were appropriate. *Some specific placements should be longer, some shorter, some eliminated.*

a) What changes would you suggest (if any)?

**Q5:** *(Challenges for interns)*

5A. **Travelling**, **accommodation** and **water** were marked as main challenges for most of the interns.

a) Can you suggest ways to help with these challenges for future interns?

5B. what do you think are the **other challenges** of work-based placements / internship placements during one-year internship period?

**Q6:** *(Challenges for the placement providers)*
Some suggested placement providers should have **incentive** for their time

a) Do you agree?
b) Can you suggest other non-monetary incentives that could be provided to placement providers?
c) Do you think providing an incentive would compromise or benefit interns' learning? And if so how?
d) Are there any other major challenges that placement providers encounter that impact intern learning?

**Q7a: Specific questions for students**

a) Other than travelling, accommodation and water, what else were the main challenges you encountered
b) How was the level of cooperation from the placement provider and associated staffs?
c) What were the most useful and challenging parts of the internships for you?
d) What would you add to the internship program for future interns?
e) What would you change in the internship program for future interns

**Q7b: Specific questions for Recent graduates**

a) What were the most useful parts of the internships in preparing you for your job?
b) What would you add to the internship program to better prepare interns for jobs?
c) What would you change in the internship program to better prepare interns for jobs?

**Q7c: Specific questions for Placement providers & employers**

a) What are the main benefits of the internships for CVASU (and its students)?
b) What are the main challenges of the internships for CVASU (and its students)?
c) What would you change in the internship program to make it better for placement providers and students?

**d)** What would you suggest CVASU should do in its teaching and learning approaches to better prepare students for the internship program in the future?

**e)** What would you suggest CVASU should do in its teaching and learning approaches in the future in the areas interns identified as not getting sufficient opportunities during the internship program?

**Q7d: Specific questions for Placement providers & employers**

a) What are the main **benefits** of the internships **for placement providers**?
b) What are the main **challenges** of the internships **for placement providers**?
c) What would you **change** in the internship program to make it better **for placement providers** and interns?

d) What do you see as the main **benefits** of the internships in preparing the **interns** you employ for their job?
e) What would you **add** to the internship program to better prepare **interns** for jobs?
f) What would you **change** in the internship program to better prepare **interns** for jobs?
g) Do you have any suggestion for interns who want to pursue a **professional career in your specialized field** (e.g. BCS Livestock, entrepreneur, pet practitioner, wildlife expert or private job?

**Q8: Ending questions**

**8A:** Can you name some **other strategies** that can be used to make the work-based learning (internship) program more effective for the interns to help them in their future professional life?

**8B:** Is there anything you think we should have talked about but didn't?

# Appendix-III

**Appendix III- Table 1:** Comparison of students' responses

| I had sufficient opportunities to | Animal type | Didn't do this | Strongly disagree N (%) | Disagree N (%) | Neutral N (%) | Agree N (%) | Strongly agree N (%) | Median | *P* (MW test) |
|---|---|---|---|---|---|---|---|---|---|
| Observe clinical cases | Farm | 0 (0) | 0 (0) | 1 (2) | 1 (2) | 25 (46) | 27 (50) | 4.5 | 0.2297 |
| | Pet | 0 (0) | 0 (0) | 0 (0) | 1 (2) | 20 (37) | 33 (61) | 5 | |
| Assist with clinical cases | Farm | 0 (0) | 0 (0) | 2 (4) | 5 (9) | 29 (54) | 18 (33) | 4 | 0.1311 |
| | Pet | 0 (0) | 0 (0) | 0 (0) | 8 (15) | 18 (33) | 28 (52) | 5 | |
| Directly handle animals and perform procedures | Farm | 0 (0) | 1 (2) | 5 (9) | 13 (24) | 24 (44) | 11 (20) | 4 | 0.3671 |
| | Pet | 0 (0) | 1 (2) | 6 (11) | 6 (11) | 28 (52) | 13 (24) | 4 | |
| Enough clinical cases at placements for me to learn | Farm | 0 (0) | 0 (0) | 0 (0) | 8 (15) | 30 (56) | 16 (30) | 4 | **0.0083** |
| | Pet | 1 (2) | 0 (0) | 0 (0) | 1 (2) | 24 (44) | 28 (52) | 5 | |
| communicate with client | Farm | 0 (0) | 1 (2) | 1 (2) | 7 (13) | 23 (43) | 22 (41) | 4 | 0.7575 |
| | Pet | 0 (0) | 0 (0) | 2 (4) | 4 (7) | 26 (48) | 22 (41) | 4 | |
| Record temperature, heart and pulse rate | Farm | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 11 (20) | 43 (80) | 5 | 0.3039 |
| | Pet | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 7 (13) | 47 (87) | 5 | |
| Assess lung and heart sound | Farm | 0 (0) | 0 (0) | 0 (0) | 2 (4) | 15 (28) | 37 (68) | 5 | **0.0184** |
| | Pet | 0 (0) | 0 (0) | 0 (0) | 1 (2) | 11 (20) | 42 (78) | 5 | |
| Palpate the liver, lymph node etc. | Farm | 0 (0) | 0 (0) | 1 (2) | 3 (6) | 21 (40) | 29 (54) | 5 | 0.0757 |
| | Pet | 2 (4) | 0 (0) | 0 (0) | 7 (13) | 24 (44) | 21 (39) | 4 | |
| Evaluate hydration/ dehydration level | Farm | 1 (2) | 0 (0) | 1 (2) | 0 (0) | 13 (24) | 39 (72) | 5 | 0.3525 |
| | Pet | 0 (0) | 0 (0) | 0 (0) | 1 (2) | 10 (18) | 43 (80) | 5 | |
| Perform pregnancy diagnosis | Farm | 0 (0) | 0 (0) | 4 (7) | 6 (11) | 29 (54) | 15 (28) | 4 | 0.4472 |
| | Pet | 2 (4) | 0 (0) | 2 (4) | 8 (15) | 20 (37) | 22 (41) | 4 | |
| Collect blood samples from different sites | Farm | 0 (0) | 1 (2) | 2 (4) | 3 (6) | 19 (35) | 29 (54) | 5 | 0.7037 |
| | Pet | 0 (0) | 0 (0) | 0 (0) | 4 (7) | 20 (37) | 30 (56) | 5 | |
| Collect and process skin scraping | Farm | 3 (6) | 0 (0) | 6 (11) | 6 (11) | 23 (43) | 16 (30) | 4 | **0.0470** |
| | Pet | 1 (2) | 0 (0) | 2 (4) | 5 (9) | 22 (41) | 24 (44) | 4 | |
| Collect and preserve post-mortem specimens | Farm | 9 (17) | 2 (4) | 19 (35) | 13 (24) | 11 (20) | 0 (0) | 2 | 0.1699 |
| | Pet | 15 (28) | 2 (4) | 20 (37) | 8 (15) | 6 (11) | 3 (6) | 2 | |
| Inject or infuse SC injection or fluid | Farm | 0 (0) | 0 (0) | 0 (0) | 1 (2) | 12 (22) | 41 (76) | 5 | 0.8254 |
| | Pet | 0 (0) | 0 (0) | 1 (2) | 0 (0) | 13 (24) | 40 (74) | 5 | |
| Inject or infuse IM injection or fluid | Farm | 0 (0) | 0 (0) | 0 (0) | 1 (2) | 11 (20) | 42 (78) | 5 | 0.6229 |
| | Pet | 0 (0) | 0 (0) | 1 (2) | 1 (2) | 12 (22) | 40 (74) | 5 | |
| Inject or infuse IV injection or fluid | Farm | 0 (0) | 0 (0) | 0 (0) | 3 (6) | 12 (22) | 39 (72) | 5 | 0.8702 |
| | Pet | 0 (0) | 0 (0) | 2 (4) | 0 (0) | 14 (26) | 38 (70) | 5 | |
| Place IV catheter | Farm | 10 (19) | 3 (6) | 15 (28) | 6 (11) | 7 (13) | 13 (24) | 2 | 0.2428 |
| | Pet | 6 (11) | 4 (7) | 9 (17) | 9 (17) | 13 (24) | 13 (24) | 3 | |
| Inject subconjunctival injection | Farm | 9 (17) | 4 (7) | 11 (20) | 13 (24) | 5 (9) | 12 (22) | 3 | 0.1477 |
| | Pet | 12 (22) | 8 (15) | 10 (19) | 12 (22) | 5 (9) | 7 (13) | 2 | |
| Perform local anesthesia | Farm | 2 (4) | 3 (6) | 9 (17) | 7 (13) | 21 (39) | 12 (22) | 4 | 0.1543 |
| | Pet | 7 (13) | 4 (7) | 7 (13) | 11 (20) | 15 (28) | 10 (19) | 3 | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Assist with common clinical cases | Farm | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 15 (28) | 39 (72) | 5 | 0.2354 |
| | Pet | 0 (0) | 0 (0) | 0 (0) | 3 (6) | 17 (31) | 34 (63) | 5 | |
| Assist with common surgical cases | Farm | 1 (2) | 0 (0) | 1 (2) | 4 (7) | 30 (56) | 18 (33) | 4 | 0.0956 |
| | Pet | 1 (2) | 0 (0) | 1 (2) | 5 (9) | 18 (33) | 29 (54) | 5 | |
| Assist with common orthopedic cases | Farm | 0 (0) | 0 (0) | 3 (6) | 8 (15) | 27 (50) | 16 (30) | 4 | 0.8634 |
| | Pet | 0 (0) | 0 (0) | 3 (6) | 7 (13) | 30 (56) | 14 (26) | 4 | |
| Assist with common reproductive cases | Farm | 0 (0) | 0 (0) | 3 (6) | 5 (9) | 27 (50) | 19 (35) | 4 | **0.0064** |
| | Pet | 5 (9) | 0 (0) | 7 (13) | 14 (26) | 13 (24) | 15 (28) | 4 | |

**Appendix III- Table 2:** Summary statistics for "opportunities to do laboratory activities" sorted by median

| **I had sufficient opportunities to** | **Didn't do this** | **Strongly disagree N(%)** | **Disagree N (%)** | **Neutral N (%)** | **Agree N (%)** | **Strongly agree N %)** | **Median** |
|---|---|---|---|---|---|---|---|
| Skin scraping test | 1(2) | 1(2) | 2(4) | 5(9) | 20(37) | 25(46) | 4 |
| Coproscopy | 1(2) | 1(2) | 2(4) | 5(9) | 19(35) | 26(48) | 4 |
| X-ray | 1(2) | 1(2) | 4(7) | 3(6) | 25(46) | 20(37) | 4 |
| USG | 1(2) | 1(2) | 3(6) | 5(9) | 20(37) | 24(44) | 4 |
| Rumen fluid test | 1(2) | 2(4) | 4(7) | 4(7) | 26(48) | 17(31) | 4 |
| CMT | 1(2) | 1(2) | 3(6) | 9(17) | 23(43) | 17(31) | 4 |
| Different smears, stain | 2(4) | 2(4) | 4(7) | 6(11) | 23(43) | 17(31) | 4 |
| Routine blood test | 2(4) | 1(2) | 5(9) | 8(15) | 23(43) | 15(28) | 4 |
| Vaginal cytology test | 7(13) | 1(2) | 6(11) | 5(9) | 14(26) | 21(39) | 4 |
| Ophthalmoscopy | 6(11) | 4(7) | 7(13) | 12(22) | 16(30) | 9(17) | 3 |
| Fluorescent dye test | 9(17) | 4(7) | 6(11) | 13(24) | 13(24) | 9(17) | 3 |
| Semen motility test | 7(13) | 5(9) | 11 (20) | 6(11) | 20(37) | 5(9) | 3 |
| Schirmer strip tear test | 10(19) | 7(13) | 11(20) | 11(20) | 8(15) | 7(13) | 2 |
| Tono-pen test | 16(30) | 5(9) | 14(26) | 7(13) | 10(19) | 2(4) | 2 |

**Appendix III- Table 3:** Summary statistics for "opportunities to perform post-mortem" sorted by median

| **I had sufficient opportunities to perform** | **Didn't do this** | **Strongly disagree N(%)** | **Disagree N (%)** | **Neutral N (%)** | **Agree N (%)** | **Strongly agree N %)** | **Median** |
|---|---|---|---|---|---|---|---|
| Poultry post-mortem | 0 (0) | 3(6) | 3(6) | 5(9) | 16(30 | 27(50) | 4.5 |
| Pet bird post-mortem | 9(17) | 5(9) | 11(20) | 4(7) | 15(28) | 10(19) | 3 |
| Small ruminant post-mortem | 16(30) | 5(9) | 15(28) | 6(11) | 9(17) | 3(6) | 2 |
| Pet animal post-mortem | 14(26) | 13(24) | 15(28) | 3(6) | 7(13) | 2(4) | 1.5 |
| Large ruminant post-mortem | 18(33) | 9(17) | 18(33) | 4(7) | 4(7) | 1(2) | 1.5 |
| Wild animal post-mortem | 16(30) | 12(22) | 13(24) | 4(7) | 8(15) | 1(2) | 1 |

**Appendix III- Table 4:** Summary statistics for "opportunities to write prescription and certificated" sorted by median

| I had sufficient opportunities to perform | Didn't do this | Strongly disagree N (%) | Disagree N (%) | Neutral N (%) | Agree N (%) | Strongly agree N %) | Median |
|---|---|---|---|---|---|---|---|
| Prescription for poultry | 0(0) | 2(4) | 3(6) | 1(2) | 30(56) | 18(33) | 4 |
| Prescription for small ruminant | 0(0) | 2(4) | 4(7) | 2(4) | 22(41) | 24(44) | 4 |
| Prescription for large ruminants/large animal | 0(0) | 2(4) | 6(11) | 3(6) | 19(35) | 24(44) | 4 |
| Prescription for pet animal | 0(0) | 2(4) | 7(13) | 3(6) | 24(44) | 18(33) | 4 |
| Prescription for pet bird | 0(0) | 3(6) | 8(15) | 6(11) | 22(41) | 15(28) | 4 |
| Dead/health/soundness certificate | 18(33) | 11(20) | 19(35) | 4(7) | 1(2) | 1(2) | 1 |

**Appendix III- Table 5:** Summary statistics for "opportunities to do husbandry related works" sorted by median

| I had sufficient opportunities to perform | Didn't do this | Strongly disagree N (%) | Disagree N (%) | Neutral N (%) | Agree N (%) | Strongly agree N %) | Median |
|---|---|---|---|---|---|---|---|
| Assess farm-hygiene and bio-security | 0(0) | 1(2) | 2(4) | 8(15) | 31(57) | 12(22) | 4 |
| Record and use clinico-epidemiological data | 1(2) | 2(4) | 10(19) | 7(13) | 27(50) | 7(13) | 4 |
| Prepare farm planning | 1(2) | 2(4) | 7(13) | 12(22) | 26(48) | 5(9) | 4 |
| Formulate balanced ration | 1(2) | 2(4) | 13(24) | 11(20) | 21(39) | 6(11) | 3.5 |
| Formulate diet chart for pet animals | 1(2) | 3(6) | 16(30) | 10(19) | 13(24) | 3(6) | 2 |

**Appendix III- Table 6:** Summary statistics for "opportunities to extension activities" sorted by median

| I had sufficient opportunities to perform | Didn't do this | Strongly disagree N (%) | Disagree N (%) | Neutral N (%) | Agree N (%) | Strongly agree N %) | Median |
|---|---|---|---|---|---|---|---|
| School kid programme | 0(0) | 1(2) | 1(2) | 2(4) | 15(28) | 34(63) | 5 |
| Livestock Vaccination programme | 2(4) | 0(0) | 1(2) | 3(6) | 20(37) | 28(52) | 5 |
| Livestock Deworming programme | 1(2) | 1(2) | 0(0) | 4(7) | 21(39) | 27(50) | 4.5 |
| Pet and bird Vaccination programme | 2(4) | 2(4) | 2(4) | 6(11) | 22(41) | 20(37) | 4 |
| Pet and bird Deworming programme | 1(2) | 2(4) | 2(4) | 10(19) | 22(41) | 17(31) | 4 |
| Farmers training programme | 0(0) | 3(6) | 5(9) | 7(13) | 22(41) | 17(31) | 4 |

**Appendix III- Table 7:** Summery statistics for "Agreement on different elements of WBL" sorted by median

| Topics | Strongly disagree N (%) | Disagree N (%) | Neutral N (%) | Agree N (%) | Strongly agree N %) | Median |
|---|---|---|---|---|---|---|
| Faculty should provide students with a feedback form to rate each of the placements | 0(0) | 3(6) | 3(6) | 25(46) | 23(43) | 4 |
| Briefing by dean and coordinator was very useful in preparing for the placements | 1(2) | 1(2) | 5(9) | 26(48) | 21(39) | 4 |
| Coordinator having initial conversation with PP through phone call or a formal letter prior to sending students was very helpful for having the cooperation | 1(2) | 1(2) | 8(15) | 22(41) | 22(41) | 4 |
| Providing learning objectives for each placement, other than prescribed generic objectives in intern logbook, from the internship coordinator and then revising with the consultation of the placement provider has been useful for structuring learning. | 0(0) | 3(6) | 8(15) | 32(59) | 11(20) | 4 |
| Monthly allowance provided by the faculty during the internship/externship was sufficient | 4(7) | 3(6) | 4(7) | 24(44) | 19(35) | 4 |
| Accommodation and travel were the major challenges for the placements | 5(9) | 6(11) | 6(11) | 15(28) | 22(41) | 4 |
| Intern log book was very useful in preparing for the placements | 3(6) | 5(9) | 7(13) | 27(50) | 12(22) | 4 |
| Overall, the duration of different rotations at different places was appropriate | 3(6) | 12(22) | 2(4) | 33(61) | 4(7) | 4 |

**Appendix III- Table 8:** Summary statistics for "Agreement on Placement providers" sorted by median

| Topic | Strongly disagree N (%) | Disagree N (%) | Neutral N (%) | Agree N (%) | Strongly agree N %) | Median |
|---|---|---|---|---|---|---|
| PP and associated staff were helpful | 0(0) | 0(0) | 7(13) | 36(67) | 11(20) | 4 |
| PP tried to clear up any confusion student had while working with patients. | 0(0) | 2(4) | 9(17) | 32(59) | 11(20) | 4 |
| PP provided with a conducive learning environment | 1(2) | 0(0) | 9(17) | 35(65) | 9(17) | 4 |
| PP tried to clear up any confusion student had during the placement | 0(0) | 3(6) | 5(9) | 39(72) | 7(13) | 4 |
| Faculty should provide monetary incentive to the placement providers | 9(17) | 7(13) | 8(15) | 23(42) | 7(13) | 4 |

**Appendix III- Table 9:** Summary statistics for "Agreement on benefits of WBL" sorted by median

| Topic | Strongly disagree N (%) | Disagree N (%) | Neutral N (%) | Agree N (%) | Strongly agree N %) | Median |
|---|---|---|---|---|---|---|
| Completion of fifth-year internship/externship experience gave a better understanding of future veterinary career options | 0(0) | 0(0) | 1(2) | 22(41) | 31(57) | 5 |
| Have developed my professionalism working at different placements during the internship programme | 0(0) | 1(2) | 0(0) | 26(48) | 27(50) | 4.5 |
| The placements were particularly useful for learning as they deal with situations that come from the real world | 0(0) | 0(0) | 2(4) | 32(59) | 20(37) | 4 |
| Completion of the fifth-year externship increased level of confidence in dealing with production animal clinical cases in the field | 0(0) | 0(0) | 0(0) | 30(56) | 24(44) | 4 |
| Completion of the fifth-year externship increased level of confidence in dealing with pet animal clinical cases | 0(0) | 0(0) | 0(0) | 31(57) | 23(43) | 4 |
| Clinical placements enhanced skills for working with production animal clinical cases in the field | 0(0) | 0(0) | 0(0) | 38(70) | 16(30) | 4 |
| Clinical placements enhanced skills for working with pet animal clinical cases in the field | 0(0) | 0(0) | 2(4) | 30(56) | 22(41) | 4 |
| Feel better prepared to work in a clinical setting with farm animals as a result of the fifth-year externship | 0(0) | 1(2) | 1(2) | 39(72) | 13(24) | 4 |
| Feel better prepared to work in a clinical setting with pet animals as a result of the fifth-year externship | 0(0) | 0(0) | 3(6) | 38(70) | 13(24) | 4 |
| Have learned about the marketing chain of dairy products, poultry products, drugs, and other products in the livestock sector in Bangladesh | 0(0) | 0(0) | 5(9) | 40(74) | 9(17) | 4 |
| Learning about current market situations of livestock and livestock products in Bangladesh has encouraged to be an entrepreneur | 0(0) | 4(7) | 9(17) | 32(59) | 9(17) | 4 |

# Appendix-IV

## List of conference attended and abstract published in conference proceeding

***Conference:*** *BSVER ASConXXVI 2020, Bangladesh Agriculture University.*

**Optimizing work-based learning in veterinary undergraduate studies by identifying factors and issues that contribute to the experiences of students, placement providers and faculty**


### Abstract

Work-based learning (WBL) provides relevant contemporary experience of working environments and helps prepare veterinary students for a range of careers. WBL refers to external placements undertaken by final year students away from the university. Potential benefits for students include developing skills and gaining greater awareness of the profession and future employment opportunities. However, challenges include finding enough placements, preparing students and managing stakeholder expectations. The aims of this project, funded by the Council for International Veterinary Medical Education (CIVME), were to identify ways to optimize the benefits while managing the challenges in delivering WBL as part of veterinary curriculum. The project had two parts: In South America and Spain, a survey was conducted to establish approaches to WBL in selected universities. In Bangladesh, an in-depth study was undertaken at Chattogram Veterinary and Animal Sciences University (CVASU). A survey was conducted on $5^{th}$-year veterinary students to ascertain WBL experiences at CVASU and was completed by 54 students. Most agreed that they had sufficient opportunities to observe, assist and directly handle pet and production animals. Top skills learned included clinical diagnosis, communication and handling patients while more surgical experience was considered desirable. Areas for improvement included careful selection of placements and adjusting time allocations. Focus group discussions (with students, recent graduates and faculty) were conducted to further explore survey findings where participants emphasized on building strong collaborations with placement providers. Overall, results suggest that the current arrangement of WBL at CVASU is reasonably good, but there are some specific areas for improvement.



**Keywords:** Work-based learning, veterinary students, Opportunities, Challenges

***Conference:*** *AAVMC Iverson Bell Symposium 2020*

## Optimizing work-based learning in veterinary undergraduate studies by identifying factors and issues that contribute to the experiences of students, placement providers and faculty

### Abstract

Work-based learning (WBL) provides relevant contemporary experience of working environments and helps prepare veterinary students for a range of careers. WBL has many potential benefits for students including developing invaluable skills (clinical, production, personal, cultural and professional) and providing a greater awareness of the profession and future employment opportunities. However, the challenges include finding enough placements, preparing students, managing stakeholder expectations, time, costs and quality assurance.

A project funded by the Council for International Veterinary Medical Education (CIVME)aims to identify ways to optimize the benefits while managing the challenges in delivering WBL as part of a veterinary program. There is considerable variation in the types of veterinary WBL offered but in the context of this project, WBL refers to external placements undertaken by final year students away from the university, rather than clinical rotations in the veterinary teaching hospital or as part of a formalized distributed model curriculum.

A literature review on veterinary WBL has been undertaken in English and Spanish and information collected on the options, benefits and challenges. In South America and Spain, a survey has been distributed to universities to establish approaches to WBL. In Bangladesh, an in-depth study is being undertaken at Chattogram Veterinary and Animal Sciences University where an externship (WBL) program has been in place for 20years. A survey has been used to ascertain experiences during externships and was completed by 54 students. Most agreed that they had sufficient opportunities to observe, assist and directly handle pet and production animal cases. The top skills learned included diagnosis, communication and handling patients while more surgical experience was considered desirable. Focus groups with key stakeholders (students, recent graduates, faculty, placement providers and employers) are underway. The study findings will be shared with the CIVME community to help inform local and international practices in WBL.

**Keywords:** Work-based learning, veterinary students, Opportunities, Challenges

# Brief Biography

**Abdullah Al Sattar** obtained his Doctor of Veterinary Medicine Degree in 2017 (held in 2018) from Chattogram (previously Chittagong) Veterinary and Animal Sciences University (CVASU) securing a CGPA 3.75 (in the scale of 4.00). Now he is a candidate for the degree of MS in Epidemiology under the Department of Medicine and Surgery, Faculty of Veterinary Medicine, CVASU. He is interested in conducting research on One Health and anthropology in future.