Ethical development in veterinary undergraduates: investigating the value of a novel reflective exercise

Carole E. M. Batchelor

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Author's Declaration

I declare that this thesis is my own composition and the work presented within it is my own. All assistance received has been acknowledged.

Carole E. M. Batchelor

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Abstract

As veterinary graduates will take up an ethically challenging role, initiatives fostering reflective thinking and moral development are being increasingly promoted in the veterinary curriculum. The aim of this study was to develop and validate a structured, reflective learning tool to promote ethical awareness in pre-clinical veterinary students. The Animal Welfare Associated Reflective Exercise (AWARE) focused on the ethical content of animal welfare related issues witnessed by pre-clinical students during extra mural study (EMS) placements. The AWARE had five sections: demographic information, animal welfare related event, personal reflection, ethical reflection and round up. Students were invited to identify, and give details of, a relevant incident that had an animal welfare impact. The AWARE guided students to reflect on their emotional reaction to the event, and its ethical basis, with reference to three well established ethical frameworks. A computer based teaching package was created to accompany the AWARE. The AWARE was piloted with 25 first year veterinary undergraduate students. Most students reflected on an experience on a lambing placement and feedback from the pilot study was positive with the majority of students self-reporting that their awareness of animal welfare and ethical issues had improved. Validation of the AWARE was then completed with a full cohort of first year vet students using a mixed-methods approach. Qualitative analysis revealed that students exhibited higher levels of reflection in the AWAREs than they did in the unstructured reflections previously completed by students following EMS placements. Ethically relevant text was also significantly increased in the AWAREs than in the unstructured reflections. However, completion of the AWARE did not improve scores on standardised measures of ethical sensitivity or moral reasoning, two components of moral development. Following validation, the AWARE was adapted for use in clinical EMS contexts. Fourth year veterinary students completed either the AWARE using a clinical situation which impacted animal welfare or a modified version of the AWARE, the Reflection on Professional Ethics (ROPE) which focused on a professional ethical dilemma. Three different frameworks were utilised in the ROPE – RCVS's ten guiding principles, the bioethical principles and virtue ethics. Engagement with the AWARE was similar in clinical and pre-clinical students but fewer clinical students left responses blank and more considered their future actions. Findings from analyses of the ROPEs indicated that veterinary surgeons struggled to meet all of their ethical obligations in difficult situations, that respect for client autonomy was met in the majority of cases, and that virtue ethics was poorly understood by students completing the exercise. Investigations into moral reasoning abilities of vet students at various points in the curriculum were also carried out, using a well-established measure, the Defining Issues Test (DIT). First year students were found to have a wide range of moral reasoning abilities but their mean scores were similar to that expected for students of their age and stage. The moral reasoning scores of clinical stage veterinary students were no higher than those of first year vet students. Application of the DIT to qualified veterinary surgeons also revealed a wide range of moral reasoning ability, with practising veterinarians scoring no higher than members of the public and over a quarter relying primarily on a basic form of moral reasoning, normally reserved for pre-adolescent children. These findings raise important questions regarding the impact of veterinary education on moral reasoning and concern for animal welfare and veterinary well-being. Ethical development is an area where both undergraduates and qualified veterinarians could benefit from improved training of ethical skills. Collectively, the findings show that the AWARE reliably elicits ethically relevant content, is viewed positively by students and has several learning benefits including improved ability to recognise and reflect on animal welfare and ethical issues. The AWARE now forms part of the veterinary curriculum at the University of Glasgow and is available to other UK vet schools.

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Glossary of acronyms

ADA	Affective Developmental Approach
AWARE	Animal Welfare Associated Reflective Exercise
CAL	Computer Assisted Learning
CDA	Cognitive Developmental Approach
CLIVE	Computer-Aided Learning in Veterinary Education
CPD	Continuing Professional Development
CTA	Cultural Transmission Approach
DEFRA	Department of the Environment, Fisheries and Rural Affairs
DEST	Dental Ethical Sensitivity Test
DIT	Defining Issues Test
EHCSI	Ethics and Health Care Survey Instrument
EMS	Extra Mural Study
ERI	Ethical Reasoning Inventory
ERT	Ethical Reasoning Test
GS	Global Stage
LEP	Learning Environment Preference Questionnaire
MJI	Moral Judgement Interview
MJT	Moral Judgement Test
PBL	Problem Based Learning
PC-EMS	Pre-clinical Extra Mural Study
PIE	Partnerships in EMS
QBA	Qualitative Behaviour Assessment
RCVS	Royal College of Veterinary Surgeons
ROPE	Reflection on Professional Ethics
SEA	Significant Event Analysis
SEERAD	Scottish Executive Environment and Rural Affairs Department
SMRs	Spontaneous Moral Reactions
SRMS	Sociomoral Reflection Maturity Score
SRM (SRM-SF)	Sociomoral Reflection Measure (and Short Form)
TESS	Test for Ethical Sensitivity in Science
VLE	Virtual Learning Environment
WEAVE	Welfare and Ethics Awareness via Experience

Chapter 1 – Literature Review

The first section (Section 1.1) outlines the relationship between ethics and animals and how this has evolved over time, as well as providing an overview of prominent ethical theories that define our duties to animals. The next section (Section 1.2) describes the ethical challenges faced by veterinarians and gives an overview of ethics education within veterinary curricula. The third section (Section 1.3) aims to provide a comprehensive synopsis of the literature available on ethics education in professional courses. The paucity of literature specific to veterinary medicine resulted in additional literature being sourced from the medical and allied health professions. This section outlines the goals of ethics teaching within professional degree courses whilst highlighting the importance of ethics teaching in veterinary medicine; gives an overview of cognitive moral development, what it is and how it is measured; and then provides critical analysis of some of the approaches that have been used in an attempt to improve moral development within the aforementioned professions. The fourth section (Section 1.4) reviews independent teaching approaches with a view to applying them to ethics education within veterinary medicine. Sections 1.5 and 1.6 outline the aims of this thesis and the approaches adopted.

Given the lack of consistency in the usage of various relevant terms in the literature, it is important to provide clarification on usage of terms in this thesis. Throughout, the words moral and ethical are used interchangeably. Strictly speaking, morals are personal character and ethics are the social system in which those morals are applied (The Chambers Dictionary, 2003). Ethics relate to a society whereas morality relates to an individual person. Ethics would be used to describe the way that veterinary professionals should behave (veterinary ethics) whereas morals would be used to describe an individual veterinarian's beliefs on the way one should live. Having said that, although ethics normally relates to the conduct of a group it can also be used to refer to moral principles of a person (one's ethics), highlighting the overlap between the terms. Although within this study, components of moral development are investigated in individuals, the aim is to apply the results to veterinary students in general suggesting that ethical development may be a more appropriate term.

1.1   Ethics and animals

1.1.1   Introduction to animal ethics

Ethics can be described as a set of principles that govern how people ought to behave (Rollin, 2006) and actions that are considered morally right or wrong. Personal ethics, which are the individual choices governing views of right and wrong, are heavily influenced by culture and religion (e.g. whether you believe it is ethically justifiable for a doctor to help a terminally ill patient to die). Personal ethics are usually borne out of a concern for someone or something else's interests and this in turn links to the interests of society and social ethics. Those parties whose interests are impacted (or potentially impacted) by a given situation are known as affected parties. Social ethics are usually widely agreed rules that form the basis of laws, e.g. humans should not kill each other. It can be argued that everyone in society benefits from these rules and these common values help to hold society together. Professional people have additional ethical duties that are specific to their profession, reflecting the specialist situations they encounter as a member of that profession. Their behaviour in these situations is guided by professional ethics, e.g. a doctor keeping patient information confidential.

Animal ethics extends across all three of these domains in some form or another: personal views in relation to animals can lead to a person not eating meat for example; some actions towards animals are prevented by law so are part of social ethics; and in the case of scientists and veterinary surgeons, ethical treatment of animals is part of their professional role. Although veterinary actions involve more than just animal ethics, animal ethics and welfare are at the centre of veterinary work. Ethics and animal welfare are 'inextricably linked' (Tannenbaum, 1991). Although the study of animal welfare is science-based, the concept of animal welfare is 'value laden', in that to have concern for animal welfare automatically assumes that animals matter, and welfare of animals is dependent on humans' views of morally acceptable care. Interests of animals are paramount in questions of animal welfare and most often for the animal this is to avoid pain or suffering.

Aside from actions that are illegal, people (e.g. an animal's owner or keeper) control what happens to animals and the consequences for the animal are dependent on the person's view towards animals. People's attitudes towards animals differ depending on 1) whether they believe animals are sentient and therefore should be afforded moral status (sentience is the capacity to have feelings and therefore to be able to suffer), 2) what they believe

their duties towards animals are (e.g. should they vaccinate their dog against life-threatening illnesses) and 3) what actions towards them are acceptable (e.g. whether veterinarians should tail-dock puppies). Affording animals moral status means that they should be given protection and that they can be wronged by immoral actions (such as those that result in unnecessary suffering). There a number of theories on moral status which are founded on properties of the being in question (Beauchamp & Childress, 2009). The theory of sentience is the only moral status theory where (non-human) animals are afforded moral status. Others are based on properties which animals do not have, for example, they are not human, and they do not have moral agency (are incapable of making judgements about morality), or that have yet to be proven, for example, whether they have cognitive capacities such as rationality, self-conscious awareness and purpose of action.

Positions on what duties one has or what actions are acceptable are influenced by cultural attitudes and religious beliefs. Religion has had a powerful influence on people's views of animals' moral worth. Biblical doctrine and classical Greek philosophers such as Aristotle assert that humans are superior to animals and that animals are resources that are available for human use. Aristotle's reasoning for this was that animals had sense perception but lacked reason (DeGrazia, 2002). Similarly, Judaism and Islam concur that humans are more important than animals, but their religious scriptures do mention that animals' pain should be minimised (Judaism) and cruelty to animals is forbidden (Islam). However, in practice this has done little to protect animals.

One way of classifying moral status of animals is to use a sliding scale that rates animals as more or less important based on their expected level of cognitive ability and sentience, with higher sentience conferring higher moral status (Beauchamp & Childress, 2009). This method could be considered scientifically legitimate. The socio-zoological scale is an example of a cultural influence where the moral standing of animals (in Western society) is rated using unscientific reasons such as how closely people identify with the individual animal, how useful the animal is, how cute and cuddly it is, or how harmful it can be. Although based on unsound reasoning it is a commonly used way of assigning moral value to animals in everyday society. Relationships with the animal can also influence the value afforded to them; whether they have instrumental value through their use to humans or whether they have intrinsic value, in that their suffering matters (Table 1.1). This is complicated further when the same species of animal can be given different moral status dependent on context (e.g. most dogs in the UK are pets and are often seen as part of the family (intrinsic value) but a large number are used in research (instrumental value)).

Moral status	Resulting duties	Reasoning
None	None	Morality is human centric and non-human animals do not have rights or moral status.
Instrumental	Indirect	An animal's value arises through its value to humans, for example in research or in farming.
Intrinsic	Direct	It matters if an animal suffers and it is our duty to try to prevent this.

Table 1.1: Moral values afforded to animals

1.1.2   Animal ethics frameworks

One of the first philosophers to consider the moral relevance of animals was Rene Descartes (1596-1650). Descartes believed that the mind and body were separate entities, and that only humans had both (Pompe, 2005a). A popular interpretation of his theory is that 'animals are machines' and thus cannot feel pain. Immanuel Kant (1724-1804) disagreed with Descartes assertion that animals did not feel pain but still did not grant them moral status. Kant's philosophy was that there were some things one should never do and that one should act out of a sense of duty (Warburton, 2004). This resulted in a rules-based ethical framework (deontology), and these rules, often known as the categorical imperative, should be applicable universally (Robinson & Garratt, 1997). Although Kant did not apply his theory to animals, his framework is the basis of modern day animal rights theory. At the same time, there was opposition to Kant's views. Jeremy Bentham (1748-1832) made the argument that rationality alone should not determine whether moral status should be granted as not all humans are rational (e.g. babies). He believed that the ability to feel should be the basis of moral status (Armstrong & Botzler, 2003), notably stating "*the question is not, 'Can they reason?' nor, 'Can they talk?' but rather, 'Can they suffer?'*" (Bentham, 1789). Bentham subsequently argued that ethical behaviour should maximise pleasure and minimise pain and he thought sentient animals should be assigned moral status. These philosophers' theories form the basis of ethical frameworks that are applied in animal ethics today. These competing frameworks help to create structure around questions of duties, actions and animal sentience and each of them will now be discussed.

Those with a contractarian stance believe that moral status is exclusive to humans (like Descartes). Moral actions are motivated by self-interest, i.e. by treating other people well, they too will treat you well. Thus, ethical obligations originate in mutual agreements

between people (contracts). As animals are not able to enter into social contracts, as they lack the rationality to do this, contractarians believe they should not be assigned rights or moral status (Pompe, 2005a). Modern day philosophers that support this view are Frey (1980) and Carruthers (1992). Although animals are not assigned moral status under this view, they can still matter indirectly, in that if harming an animal upsets another human then that could be considered morally wrong. Therefore, in some circumstances they may be considered to have instrumental value. This would be most common for animals that rate highly on the socio-zoological scale such as dogs.

Utilitarians, in contrast, believe animals have intrinsic moral value and see an animal's capacity to suffer as a relevant consideration when making ethical decisions. An animal's capacity to suffer means it has interests; interests to increase pleasure and prevent pain (as postulated by Bentham). These interests count morally and should be given equal consideration to those of humans. The premise of utilitarianism is that these interests are quantifiable and harms and benefits should be weighed against each other in order to decide what to do; the aim being to find 'the greatest good for the greatest number'. Utilitarianism is based on consequences (for both humans and animals) and seeks to maximise human and animal wellbeing. Nevertheless, actions that have a negative impact on animal welfare may be justified if they lead to an overall increase in welfare for humans or other animals. An influential utilitarian, Peter Singer (1975), uses the argument that the harms caused by factory farming outweigh the benefits humans get from affordable meat production, to argue that animals should not be mass produced for food.

The first notable animal rights movement came about in opposition to the use of unanaesthetised animals in research (DeGrazia, 2002). The animal rights view is that animals have moral status and moral rights. The framework is based on fixed ethical rules that should never be broken (in the same vein as deontology) and that these rules limit what we can and cannot do to animals irrespective of consequences. Unlike utilitarianism, it takes the rights of individual animals into consideration. Three increasingly strong levels of radicalism in relation to the rights of animals are recognised. The least radical is those that assign animals rights but fewer rights than humans; this is known as the moral-status sense. The equal-consideration sense is slightly more radical; supporters of this view consider animal suffering to be as important as human suffering. Others, such as Regan (1983), think that the rights of animals should be protected irrespective of whether this would have a detrimental impact on people, e.g. banning the use of animals in scientific research. This is the most radical view and is referred to as the utility-trumping sense

(DeGrazia, 2002). The moral-status sense and the equal-consideration sense are used in both utilitarian and animal rights arguments. The utility-trumping sense is an argument used only by animal rights supporters. The intransigent nature of radical animal rights views means they can be challenging to apply in practice.

The three frameworks outlined above are the most commonly discussed in animal ethics literature but there are two other ethical frameworks which can be useful for considering our treatment of animals: the relational view and the respect for nature view (Sandoe & Christiansen, 2008). The relational view is concerned with how close the relationship between an animal and a human is and focuses on this relationship in order to decide how the animal should be treated, for example, people who support this view may object to killing of horses for meat but not of cattle because horses are considered pet animals. In this view, it is our relationships with animals that define our duties towards them (Burgess-Jackson, 1998).

In the respect for nature view, the species or even the ecosystem is morally valued and it is more important than the individual animal or the level of sentience of the animal in question (Palmer & Sandoe, 2011). In this sense, the species is considered a life form. Moral duties do include protecting individual animals, but the species and the integrity of the species take precedence. Nature should be respected so supporters of this view believe that nature should not be genetically modified for example.

Although all five frameworks help to provide structure in discussions of animal ethics, they are not without their weaknesses. In deontology, there is the problem of conflicting obligations to individuals where their interests are opposing and in utilitarianism, there is the problem of defining and weighting costs and benefits, and difficulties in predicting the outcomes of certain actions. Moreover, acts that would normally not be defensible are sometimes acceptable under a utilitarian view (Warburton, 2004), e.g. it may be acceptable to deliberately kill a human being for 'the greater good'. In contractarianism and the relational view, sentience is not taken into consideration (as it is not considered relevant) and under the respect for nature view, species themselves are not sentient leading to difficulties in how interests are defined.

While these ethical frameworks are useful in helping to defend ethical views, in practice people often combine aspects of different frameworks to guide their thinking on our duties to animals, and this is referred to as a hybrid view (Palmer & Sandoe, 2011). For example,

if one believes there are certain actions that are never acceptable (e.g. to cause an animal intense suffering) but believes actions that lead to less severe outcomes, such as moderate suffering, are acceptable if the consequences are sufficiently beneficial (e.g. animal experiments that benefit several humans), then this would be a combination of animal rights and utilitarianism. Using a hybrid view is not as consistent as following individual frameworks but can help avoid disillusionment with frameworks due to their stringent nature.

1.1.3   Evolution of animal welfare

Early interactions with animals centred on their use for food or as work animals. The first animal protection law (passed in England in 1822) focused on animals with high utility (horses, cattle and sheep) and the only protection afforded was prevention of wanton cruelty, and only if carried out by someone other than the owner of the animal. This anti-cruelty legislation was influenced by the philosophy of Bentham and his concern with animal feelings (Armstrong & Botzler, 2003, p180). Concern towards the welfare of animals was growing, and in 1911 the first comprehensive law protecting animals was passed (The Protection of Animals Act 1911). This act forbade anybody from causing unnecessary suffering to any animal by either action or inaction and remained in place until 2006. In the mid twentieth century (following World War 2), agriculture became increasingly industrialised (Rollin, 2006) and this raised new questions around the welfare of animals raised in intensive production systems and their quality of life. Many of these systems kept animals in cramped conditions, with little in the way of environmental enrichment, which then led to behavioural problems. Intensive selection for genetically favoured attributes also led to associated welfare problems such as mastitis in high yielding dairy cows (Rauw et al., 1998). This introduced the need to protect them not just from wanton cruelty but from production diseases and inhospitable manmade environments (Sandoe & Christiansen, 2008). Many of these afflictions were brought to the public's attention through Ruth Harrison's book (1964), 'Animal Machines'. The book described the stark conditions in which farm animals were being kept, and coined the phrase 'factory farming'. As a result of public pressure around this time, the UK government commissioned the Brambell report (1965) which recommended mandatory standards of welfare, and resulted in the formation of the Farm Animal Welfare Council (FAWC). In the 1960s, the Council of Europe also began creating international agreements relating to

animal welfare standards and it now has five conventions in place to protect the welfare of animals, including the European Convention for the Protection of Animals kept for Farming Purposes. These conventions form the basis of current European Union legislation on animal welfare. In the early 1970s, increased concern for individual animals led to the birth of animal rights groups such as the Animal Liberation Front (Armstrong & Botzler, 2003). This was followed by the publication of two influential books, Peter Singer's 'Animal Liberation' (1975) used a utilitarian framework to defend the interests of animals and Tom Regan's 'The Case for Animal Rights' (1983), which defended the rights of animals as complex beings with inherent value. In the 1980s, the animal rights movement was seen as a threat to capitalism (Armstrong & Botzler, 2003) and although a vocal minority of people still support this framework in its purist sense, advocating animal welfare is now the mainstream view.

1.2   Ethics and the veterinary profession

1.2.1   The ethical challenge faced by veterinarians

Changes in animal use (reduction of use for work/transport, increase in factory farming/meat consumption and increase in biomedical research) and evolving societal attitudes towards animals (increase in pet ownership and anthropomorphic views of animals as substitute children) have significantly impacted the working lives of veterinary surgeons. Historically, veterinary surgeons focused on care for horses and farm animals (Rollin, 2006) as these were the most economically important. Recently, the role of veterinary surgeons has become much wider. They are responsible for a much broader array of species, including companion animals, laboratory animals, zoo animals and exotic pets and an increasing proportion of their work derives from companion animals (dogs/cats). There has also been a change of focus, with veterinarians being seen as responsible for good welfare as well as good clinical health, thus altering their ethical responsibilities and influencing changes in the professional code of conduct (Woods, 2011).

Originally, codes of ethics pertaining to veterinary surgeons were chiefly concerned with ideas of professionalism and good conduct (Fentener van Vissingen, 2001) rather than specific concern for animals, and were mainly based on virtue ethics. Virtue ethics centres

on one's character and is concerned with leading a 'virtuous life'. Virtue ethics involves making judgements about the best way to behave in a particular circumstance and is adaptable depending on the individual situation. It favours traits such as integrity, generosity, honesty and courage (Warburton, 2004) but there is no finite list of virtues. Although the welfare of animals is of concern to veterinarians nowadays, it is not always clear whether the interests of the client or the animal should prevail. This has been described by Rollin (2006), one of the most prominent veterinary ethicists, as "the fundamental problem in veterinary ethics". For veterinarians, there is an inherent conflict between doing what is required to end the life of a suffering animal, for example, but also to keep the client happy by doing what they ask (which may be to continue treatment). This conflicting prioritisation in care has been described using metaphors relating to service and care. Rollin (2006) refers to the 'mechanic model' (where the veterinarian is essentially a service provider to the client) or the 'paediatrician model' (where the veterinarian is primarily an advocate and care provider for the animal patient). In an attempt to push veterinarians towards the latter, the UK veterinary oath now explicitly states that veterinary surgeons' primary consideration should be to the welfare of the animals in their care (RCVS, 2010a), but this is not always possible. As well as their responsibilities towards their animal patients, veterinarians have obligations to several other parties including the client, themselves, their peers and society as a whole (Rollin, 2006). These parties have different interests and obligations to them often conflict. The situation is further complicated by the lack of general agreement with respect to our duties to, and the moral worth of, animals. In difficult situations, harm may be unavoidable no matter what is done, and this leads to ethical dilemmas.

Ethical dilemmas are situations in which it is not clear which is the right course of action, often because of difficulties in balancing competing interests (Morgan & McDonald, 2007). Most ethical dilemmas in veterinary medicine involve conflicting owner and animal interests. The conflicting interests of parties are well-documented in the veterinary literature (Tannenbaum, 1993; Mullan & Main, 2001; Williams, 2002; Rollin, 2006; Morgan, 2009; Wiseman-Orr et al., 2009) with most researchers agreeing that veterinarians have a difficult moral position and responsibility to both the client and the animal patient. There are a plethora of ethical issues faced by veterinarians in everyday practice. Some common examples are conflicts between animal quantity of life versus quality of life, over-treatment that may cause prolonged suffering, disagreement between the veterinarian and the client as to what should/can be done to treat the animal, lack of ability or willingness

by the client to pay for treatment, convenience euthanasia and requests for unnecessary cosmetic procedures (Morgan, 2009).

Ethical dilemmas can be a daily occurrence in veterinary practice (Self et al., 1994; Batchelor & McKeegan, 2012) and there is concern that continued exposure to stressful situations can result in 'moral distress' (Wiseman-Orr et al., 2009), depression and even a predication to commit suicide (Bartram & Baldwin, 2010). These situations will be more stressful if veterinarians are not given any guidance on how to make difficult ethical decisions and the need for life-long learning to prevent 'ethical erosion' has been highlighted (Johnston, 2011).

Although there are several similarities between medical and veterinary ethics (professionalism, patient care, confidentiality), there are fewer moral certainties in veterinary medicine than in human medicine and this can make ethical decision making more challenging. Prolonging human life is a fundamental value in human medicine whereas in veterinary medicine quality of life often overrides quantity of life, leading to situations where euthanasia is the best option. Animal patients do not have the autonomy of human patients, which raises more difficulties. Care centres on avoidance of suffering (Johnston, 2011) but is limited by the decisions made by proxy (client/owner) on behalf of animals. Even if they were to attempt to prevent treatment through their behaviour (e.g. by being aggressive during a clinical exam), it is presumed that 'we know best' (DeGrazia, 2002).

Although there is evidence for an abundance of ethical issues facing veterinarians, the veterinary profession has been slow to react and has not driven changes in welfare improvement and policy on 'ethical controversies' (Rollin, 2006). Consequently, veterinary ethics literature is limited, with only a few texts of note available on the subject (Tannenbaum, 1989; Rollin, 2006). Furthermore, a review of research into ethical development in different professions carried out by Weaver and colleagues (2008), did not find any literature pertaining to veterinary medicine although material from non-healthcare professions such as psychology, accounting and journalism was considered. However, discussion of veterinary ethics has recently become more widespread in vocational magazines and peer reviewed journals (for example 'Everyday Ethics', a column appearing in 'In Practice' and Rollin's monthly column in the Canadian Veterinary Journal). The Royal College of Veterinary Surgeons (RCVS) (which regulates the veterinary profession) provides a Guide to Professional Conduct (RCVS, 2010a). Although veterinarians are

expected to adhere to these guidelines, they are only guidelines and are, arguably, open to interpretation. They also do not specifically prescribe what veterinarians should do in various situations and therefore provide ethical freedom within the profession. This can lead to inconsistent practice as it is not clear what is expected of veterinarians e.g. one veterinarian may give emergency treatment even when a client cannot pay, another may think they are not obliged to give this treatment unless they are paid for their time (Morgan, 2009). These differences in perception of ethical responsibilities can also lead to inconsistencies in whether veterinarians describe a situation as an ethical dilemma or not, and to different priorities when it comes to animal care (as described by Rollin's (2006) paediatrician/mechanic model). The only sizeable piece of research into how veterinary surgeons make decisions when faced with moral dilemmas in practice was carried out by Morgan (2009). Morgan interviewed 41 veterinarians practising in Canada and observed ten of these veterinarians. She found that veterinarians make judgements about their clients' behaviour and they have clear ideas about how their clients should behave. In concordance with these beliefs, the veterinarians decided whether the clients were making good decisions for their animals, and the veterinarians described giving preferential care to patients and clients who they assessed positively. Morgan states that some situations were 'morally clear' to almost all veterinarians and cites the example of the client's responsibility to provide food and water to animals and this being pivotal to their welfare. However, this is an assessment of an essential welfare need and so is not really a dilemma. The study proposed a framework showing how veterinarians make decisions in difficult situations. The framework consisted of three questions – 'is this situation bad for the animal?', 'is the client acting reasonably?', and 'is it my job to intervene?'. The framework provides insight into how veterinarians make decisions and highlights the triangular relationship between the veterinarian, the client and the animal patient but, of more importance, is that veterinarians' differing beliefs on animal welfare, the responsibilities of clients and their professional responsibilities as well as their personal assessment of the owner result in inconsistencies in the care offered. The study provides scientific evidence to support the difficulties faced by veterinarians in first recognising when there is a moral issue involved, and then in how to resolve ethical dilemmas in practice and promote animal welfare. Numerous factors impact whether prioritisation is given to animal welfare including concerns relating to financial impacts, their reputation, obligations to their employer, the risk of inciting client resentment and lack of external support (in cases of animal abuse).

Uniquely, veterinary care involves a three-way relationship between the animal patient, the client and the veterinary surgeon (Williams, 2002) and good veterinary care involves constantly trying to balance the interests of those different parties. This brings with it extensive ethical responsibility. Veterinary ethics originally concentrated on a veterinarian's role as a professional but has grown to include matters of animal care and welfare. The diversity of ethical issues faced by veterinarians highlights the difficulty of the role. This difficulty is magnified by the ethical freedom that is afforded to them through lack of clear guidance on what is acceptable in problematic situations and also in the lack of agreement in our wider duties to animals. Research on ethics within veterinary medicine is in its infancy, perhaps because until recently the educational focus has primarily been on the scientific aspects of the role.

1.2.2   Veterinary education

1.2.2.1 Development of veterinary education

Veterinary education in the UK began in 1791 when the first veterinary college was established in London and was followed a few decades later by the Edinburgh Veterinary College. The first veterinary course was three years long, and the horse was the main focus of instruction. In 1881, the Veterinary Surgeons Act made it illegal to practice veterinary surgery unless a registered member of the Royal College of Veterinary Surgeons. Around this time, and into the beginning of the twentieth century, there was curricular expansion and the course became longer (Dale, 2008). As veterinarians had to learn about several different species and several different topics in detail there soon became the problem of curriculum overload. In order to deal with this, traditional didactic modes of teaching were used (Raidal & Volet, 2009), with emphasis on memorisation of large amounts of factual knowledge. However, this mode of teaching often leads to surface learning (Canfield, 2002). Surface learning is where the student focuses on memorising facts, puts little effort into understanding the material or relating it to a wider context and tends to reproduce material provided by lecturers or textbooks (Felder & Brent, 2005). Students are poor at applying their knowledge when taught in this way (Lane, 2008), creating problems in linking pre-clinical work to clinical cases (Howell et al., 2002). As long ago as the 1960s, authors were stating that there should be movement away from memorisation and students should have more active participation in learning (Clark, 1965, Hoerlein, 1965, Armistead, 1965, Reed, 1965). Even so, it was not until the 1990s that there was a significant shift

away from this format to a more student-centred approach based on integration, problem solving and self-directed learning (Dale, 2008). These approaches allow students to take an active role in their learning and encourage the use of a deep approach. Deep learning is where a student focuses on understanding and applying the new information rather than memorising it (Felder & Brent, 2005). Similarly, subjects such as ethics and moral philosophy (Rollin, 1977), communications skills (Reed et al., 1974) and business management skills (Morrow, 1976) that were introduced to veterinary curricula in the 1970s, have only much more recently been given ample attention in UK veterinary curricula.

1.2.2.2 Ethics education in veterinary medicine

As stated, until the 1970s veterinary ethics was a relatively untouched subject within veterinary curricula. Since then it has become a more readily accepted part of the veterinary curriculum with all veterinary schools in the UK incorporating some formal ethics teaching into their courses (Batchelor & Clarke, 2012, unpublished data[1]). No specific research has been carried out on the type and level of ethics teaching given in UK veterinary schools, though a survey of ethics teaching across all US vet schools has been published (Self et al., 1994). One paper (Magalhaes-Sant'ana et al., 2010) has investigated ethics teaching in European veterinary faculties, which included UK schools but does not contain detailed information specifically about teaching in the UK. Magalhaes-Sant'ana and colleagues (2010) concluded that there is little consensus on how and where ethics fits into the curriculum, and they state that there are many pedagogical approaches used to teach ethics. An additional finding was that there was no clear competency acquisition for ethics. In the UK this is not necessarily the case as ethics is now mentioned in the RCVS's 'Day One and Year One Competencies' for graduates (RCVS, 2010b) and graduates are expected to 'be aware of their ethical responsibilities to the patient, client and community' and 'to conduct themselves in a professional manner'. However, these are not easily assessed (Wiseman-Orr et al., 2009). Competencies such as moral reasoning skills (which aid in decision making and could be considered vital skills for veterinary graduates) are

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[1] Results of a short survey on animal welfare and ethics teaching in UK veterinary schools, presented at a collaborative workshop at the 3rd Veterinary Education Symposium, Edinburgh.

more easily assessed (see section 1.3.4.2). Furthermore, the importance of ethics is still often overlooked; in one study looking at non-technical competencies important to success as a veterinarian, moral reasoning was not mentioned; all of the competencies identified related to business acumen (Lewis & Klausner, 2003).

The preceding section on veterinary education shows that modern approaches to teaching, so called student-centred approaches, have become the predominant teaching mode in veterinary education in the last two decades. This time frame has also seen the adoption of less traditional subjects into veterinary curricula such as ethics. As formal ethics teaching is a relatively new addition to the veterinary course much work is still required to establish how best to teach it and how to quantify the outcomes of that teaching. The approaches used to date will now be considered.

1.3   Ethics education

One of the major obstacles in researching ethical pedagogy is the inconsistency in terminology. Ethics is relevant to almost all academic subjects (e.g. medicine, veterinary medicine, health professions, law, business, life sciences) and the term 'ethics' represents different things depending on what is considered relevant in the particular profession/discipline under study (Anderson & Davies, 2000). This makes it difficult to synthesise research findings. In addition, terms with the same meaning are often referred to differently (e.g. moral judgement and moral reasoning).

1.3.1   Ethics teaching in professional education

1.3.1.1   Common educational philosophies

It is only in the last twenty years or so that ethics has received significant attention in healthcare education (Self, 1993). Prior to that, there was often the belief that ethics could not be taught any later than childhood (Bebeau, 1993; Latif, 2000; Huff & Frey, 2005). However, this may have been due to a misconception of the term 'ethics'. If referring to ethics in the sense of one's moral values then it may be the case that these are determined early in life but altering one's ethical development can be achieved later as many studies have shown (Self et al., 1993a; Hartwell, 1995; Self & Olivarez, 1996).

Of the scientifically-based professions, medicine led the way in establishing ethics teaching as part of the formal curriculum. Ethics was introduced to medical courses in the early 1970s and became an established part of the medical curriculum by the end of that decade (Miles et al., 1989). In a paper comparing the approaches used to teach ethics in medicine, Self (1993) describes three educational philosophies – the Cultural Transmission Approach (CTA), the Affective Developmental Approach (ADA) and the Cognitive Developmental Approach (CDA). The CTA focuses on the teaching of professionalism, including oaths and codes, and centres on the transfer of facts and values. It centres on the profession itself rather than individual students. This traditionally was how ethics was taught to the professions (Self, 1988). The ADA focuses fundamentally on the development of virtues (e.g. empathy, compassion) and self-awareness in order to aid communication. This approach focuses on individual students. The CDA, also a student-centred approach, based on scientific theories, aims to develop reasoning, both logical and ethical (Self, 1993). The study showed that the CDA was the most commonly used teaching approach followed by the CTA, with the ADA being least commonly used. In line with the refocus of teaching methods in veterinary education, this indicates a similar shift in ethics instruction towards self-directed learning from didactic teaching.

One widely applied framework of ethical principles used in medicine (and referred to in many of the studies cited in this review) are the bioethical principles developed by Beauchamp & Childress (1974). These principles were developed to ease decision-making and help solve moral dilemmas within medical ethics (and possibly ethics in general) and can be applied individually or in combination (Gillon, 2003). They are popular as a teaching tool to help resolve moral dilemmas in medicine and other related professions. There are four principles, namely *beneficence*, *non-maleficence*, *respect for autonomy* and *justice*. *Beneficence* means to do good and *non-maleficence* refers to doing no unnecessary harm. In human medicine, *respect for autonomy* is concerned with respecting the decision-making capacities of patients in relation to their care. However, in veterinary medicine the animal patient is not autonomous, making this principle harder to apply. The fourth principle, *justice*, centres on fairness, in that each patient should be afforded the same level of care and attention as any other patient in a similar situation. Again, this is more difficult to apply in a veterinary situation than in a human medical one (due to species differences and differing animal use).

1.3.1.2 Perceptions of ethics

In veterinary and other scientifically-based professional degrees, one of the main challenges to teaching ethics is that it is often perceived as irrelevant as students think the main focus of the course is science (Nolan & Smith, 1995; Rollin, 2006). Lack of assessment of ethics can also lead exam-driven veterinary students to think of it as unimportant (Main et al., 2005). One of the reasons that students may not see the relevance of ethics teaching is that they do not foresee ethical conflicts occurring when working as a professional. Nolan & Smith (1995) surveyed groups of dental, medical and nursing students in the UK and found that none of the dental students and fewer than half of the medical and nursing students anticipated having to deal with ethical conflicts as part of their job. This indicates that students are ill-prepared for the ethical demands of their future roles.

A possible way to alter students' perceptions of ethics is to teach it in a 'subject relevant' way. In one study, the change in perception of ethics in Iranian nursing students exposed to two different teaching approaches (a traditional lecture-based approach and an approach based on Action Research which allows students to actively participate in discussions) were compared. Students in both groups reported that relevance to their daily work was important in ethics teaching, and that they did not want to be overloaded with theoretical information (Nasrabadi et al., 2009). Furthermore, actively participating in discussions improved the students' perception of ethics, compared to those in the traditional group who had a negative perception of ethics. Thus, focusing on student-centred teaching approaches (such as the CDA) could help to improve students' perceptions of ethics as well as aiding their ethical development.

1.3.2   Intended pedagogical outcomes of veterinary ethics teaching

Before discussing the approaches best used to teach ethics, consideration must first be given to which skills and attributes teaching is aiming to improve. There is sometimes disagreement on the central aims of professional ethics education, with some stressing the importance of virtues and professional responsibilities (Rhode, 1992; Huff & Frey, 2005; Main et al., 2005; May, 2011) but the majority focus on a cognitive approach involving recognition and reasoning (Self, 1993; Wiseman-Orr et al., 2009). In general, ethics

education should first aim to improve students abilities to recognise ethical issues within a scenario (including identifying the affected parties) (Rhode 1992; Latif, 2000; Huff & Frey, 2005). In addition, veterinary students should understand there are different ethical perspectives and be able to identify these perspectives and discuss their strengths and weaknesses (Wiseman-Orr et al., 2009). A pluralistic, skills-based approach to teaching is often the favoured method to achieve this:

> "Ethics teaching at a university should not, in our view, amount to a kind of moral lecturing. We believe that the aim of teaching is to give the students state of the art knowledge and understanding. … Therefore the best way to present ethics to students on an introductory course is to describe competing theories, show that each has certain strengths, but make it obvious at the same time that they cannot all be correct because they are incompatible.
>
> A clear advantage of this approach is that, through it, the students themselves become engaged in ethical reflection. They are not just presented with things to learn. They are challenged to make up their own mind on matters that call for answers but where the 'right answers' cannot simply be set before them."
>
> (Sandoe & Christiansen, 2008)

Nevertheless, some value based teaching is likely to also be incorporated e.g. that the animal's welfare matters (Mullan & Main, 2001). Just as students should be discouraged from taking the view that there is only one right way (moral absolutism) so too should they be discouraged from thinking that all views are equally valid (moral relativism) (Wiseman-Orr et al., 2009). The learning objectives outlined above lay the foundations of ethical development and would be achievable objectives for students in the early stages of the veterinary course.

At more advanced stages, students should be able to identify and evaluate options for action (Rhode, 1992; Mullan & Main, 2001), understand ethical frameworks, give reasoned defences of views (even those they disagree with), apply ethical frameworks to support these views (Schillo, 1999), and reason through a dilemma to resolution (Rhode, 1992; Smith et al., 2004). These aims advocate a cognitive skills-based approach. Applying these skills in practice is important for veterinarians as it will help them make decisions and logically defend the decisions made. Using conceptual frameworks (based on ethical principles) can be an important tool in this regard (Yeates, 2010).

The reason it is important to teach ethics to veterinary students is because firstly, students need to be given some guidance for their professional role (Bebeau, 1993), secondly, veterinarians should be at the forefront of ethical decisions involving animals (Rutgers,

2011) and thirdly, and most importantly, because teaching ethical skills prevents irrationality (being led by emotions) and double-standards (acting hypocritically) when making decisions (Sandoe & Christiansen, 2008). Sandoe and Christiansen (2008) additionally assert that being able to rationally defend one's view helps to get one's opinion across more successfully. Teaching ethics to veterinary students may also help them in other veterinary subjects (e.g. ethical issues in pain, disease transmission) and may encourage them to think about issues they had not previously considered (Reiss, 2005).

1.3.3   Moral Development

Improving the cognitive skills outlined in the previous section will contribute to what is scientifically described as cognitive moral development. The cognitive aspects of moral development have been defined by Rest (1983) in his Four Component Model of Morality (Table 1.2). The four component model consists of moral sensitivity, moral reasoning, moral motivation (or imagination) and moral character. Moral (or ethical) sensitivity is usually considered the most basic of these components (Wiseman-Orr et al., 1999). For full ethical development to have taken place, improvements in all four of these components must be seen (Rest et al., 1997). Very little empirical research has been carried out on the latter two components (moral motivation and moral character) and no comprehensive measures are available with which to assess them (Walker, 2002). Moreover, Clarkeburn and colleagues (2002) considered moral motivation and moral character "unacceptable and unreasonable aims for any ethical course", specifically, because of the lack of agreement on what constitutes each component and whether these components should be subject to influence through education (Clarkeburn, 2000). Therefore, this review will consider the first two components, ethical sensitivity[2] and moral reasoning. These two components tend to represent early ethical development and were of interest here as influencing them is a credible goal of ethics education. There are variations in the way these components are defined, for example, Kekes (1984) uses the term moral sensitivity to describe someone who is 'alive' to moral possibilities. For the purposes of this review, ethical sensitivity will be defined as the ability to recognise ethically relevant issues within a scenario (Hebert et al., 1992; Clarkeburn, 2002; Morgan, 2009) and moral reasoning as the process by which

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[2] This concept will be referred to as ethical sensitivity from hereon as this is how it is most commonly referred to in the relevant literature.

one comes to a decision when faced with an ethically problematic situation (Rest et al., 1997). Moral reasoning involves defining what the moral issues are and giving consideration to all the parties affected, as well as determining the best course of action.

Component	Description
Moral sensitivity	How the situation is interpreted, how perceiver empathises
Moral reasoning	Determining that one course of action is morally justified
Moral motivation	Degree to which one prioritises acting morally above other values
Moral character	Self-regulation, discipline, following through on convictions

Table 1.2: Four Component Model of Morality
Adapted from Rest, 1983.

1.3.3.1 Stages of moral reasoning development

Drawing from Piaget's studies of child development (Piaget, 1932), Kohlberg (1958) pioneered a six stage theory of cognitive moral development that described how individuals develop their capacity to reason morally. These six stages are sequential, starting at the most basic level and becoming increasingly complex (Table 1.3). Kohlberg's cognitive moral development theory was based on a justice concept of morality. This means that principles of justice are considered the highest principle of morality (Self et al., 1992). Some researchers have questioned this foundation (Gilligan, 1982) and in particular, suggest that females base their moral reasoning on a duty to care for others, rather than using a rule-governed, justice-based framework. However, several studies have since discredited this idea as females often outperform males on tests of moral reasoning that are based on justice concepts (Self et al., 1988; 1996; 1998a).

Level	Stage	Basis for reasoning
Pre-conventional	Stage 1 - Heteronomous morality	Aim is to avoid punishment, mainly by following authority. Often physical consequences described for 'wrong behaviour'. Reasoning often involves words such as 'must' and 'always'. Reasoning is egocentric.
	Stage 2 - Instrumental relativism	Aim is to win rewards; still egocentric but considers others needs if impacts own needs e.g. I'll scratch your back if you scratch mine.
Conventional	Stage 3 - Interpersonal conformity	Seeks social approval; revolves around relationships with others and wants to avoid disapproval, often refer to putting themselves in other's shoes. Attends to social norms.
	Stage 4 - Community conformity	Wants to maintain order through law, not solely about themselves about society as a whole.
Post-conventional	Stage 5 - Social utility and individual rights	Considers society and individuals within society. Believes in equality and that we have an obligation to others. Would challenge laws if violated their fundamental principles.
	Stage 6 - Universal ethical principles	Universal ethical principles centred on the notion of justice. Similarly to Stage 5, would act on principles if law violated them.

Table 1.3: Kohlberg's six stages of cognitive moral development
(adapted from Hartwell, 1995). N.B. Stage 6 is not distinguishable from Stage 5 in any assessment measures and the two are normally grouped together as 'post-conventional level reasoning'.

Kohlberg's six stages are often condensed into three levels of two stages each – pre-conventional (stages 1 and 2), conventional (stages 3 and 4) and post-conventional (stages 5 and 6) (Table 1.2). Pre-conventional is the most basic level of moral reasoning, where reasoning is based on winning rewards, obeying authority and avoiding punishment. Reasoning tends to be black and white so actions are classified as either right or wrong. This is the level of moral reasoning usually used by young children (Kohlberg, 1968) and as such there is little or no recognition of the ethical issues involved. Moral reasoning then progresses to the conventional level. At this level, there is movement away from self-interest and reasoning is based on conforming to social norms. Relationships with others are important at this level and an understanding that interdependence between members of

society is required to maintain order is apparent (Gibbs et al., 1992). Although actions may be questioned, the action taken will tend to remain within traditional boundaries. Most competent adults attain this level (Hartwell, 1995). The most advanced level of moral reasoning is post-conventional moral reasoning, in which there is critical thinking about relevant ethical issues, use of ethical frameworks to justify various viewpoints and a willingness to challenge unethical practices. Post-conventional reasoners are able to formulate arguments for and against different viewpoints, can see the validity of arguments that they do not support and take personal responsibility for their choices. Professional education aims to equip graduates with the tools to develop well-reasoned arguments for professional problems (Bebeau, 2002), which are often complex, and moral maturity is linked to better clinical performance (Sheehan et al., 1980; Krichbaum et al., 1994). Hence, achieving a predominance of post-conventional moral reasoning should be sought in professional programmes.

1.3.4   Assessing moral development

1.3.4.1 Assessing ethical sensitivity

Various measures have been created in an attempt to measure ethical sensitivity. Many of these measures were designed for a particular discipline, the Dental Ethical Sensitivity Test (DEST) (Bebeau et al., 1985), the Test for Ethical Sensitivity in Science and Engineering (Borenstein et al., 2008), the Nurses' Ethical Sensitivity Test (Byrd, 2006) and the Racial Ethical Sensitivity Test (Brabeck et al., 2000). The subject-specific nature of these tests has possibly restricted their use and often the study in which they were developed is the only cited reference using the test. However, some aspects of the tests are transferable, such as the scoring systems. For example, Myyry & Helkama (2002) based their scoring system on that of the DEST when investigating the ethical sensitivity of psychology students.

The most extensive research on ethical sensitivity has been done with dental students at the University of Minnesota. Here, Bebeau and colleagues (1993) developed an ethics curriculum along with dentistry specific tests for measuring improvements in the different components of Rest's morality model (1983). Their Dental Ethical Sensitivity Test (DEST) requires the student to take on the role of the dentist in a professional scenario (Bebeau et al., 1985). The test has undergone rigorous validation and there is evidence that ethical sensitivity can be reliably assessed using this test (Bebeau, 1993). Although this approach

has proved to be successful, it could be considered relatively advanced for first year students as it replicates real-life patient-dentist consultations using videotaped scenarios and expects students to comment on how they would proceed in a clinical situation. It is also time-consuming to administer because students are presented with these scenarios individually.

A common and possibly simpler way of measuring ethical sensitivity has been to use vignettes (short pieces of text describing an ethically challenging scenario). Students are normally asked to identify the ethical issues present in each vignette and a scoring system is developed (usually by experts) to ascertain whether the pertinent ethical issues were identified. A test that utilises this idea in an attempt to measure ethical sensitivity in university students is the Test for Ethical Sensitivity in Science (TESS) (Clarkeburn, 2002). It was designed to measure ethical sensitivity in life science students and is a pen and paper test that presents an ethically problematic scenario to students. It uses a vignette that describes a controversial research proposal to produce pharmaceutical milk from cows to help treat cystic fibrosis. Students are asked to list up to five questions that they think need to be answered before the research can progress. Purposely they are not explicitly asked to list ethical issues; the aim is to ascertain whether students will identify ethical issues without prompting. Although designed for life science students, the TESS is not subject-specific (Clarkeburn, 2002) and the vignette presented in the TESS has relevance to veterinary students. Therefore, it may provide a suitable method of assessing ethical sensitivity in veterinary students in the absence of a veterinary specific measure. Vignettes are an easily adaptable measure and can be created quickly and easily to suit the subject in question. The TESS measures spontaneous thought which is an important element of ethical sensitivity (the ability to identify issues without prompting). They provide an easily implemented measure for use in researching a component of ethical development which emerges as one that is hard to measure. However, the construct validity, that is the degree to which the test measures the construct it is designed to investigate (Rest et al., 2000), of vignettes may be poorer than those of subject-specific tests such as the DEST.

1.3.4.2 Assessing moral reasoning

Moral reasoning has been the most extensively researched component of the Four Component Model of Morality (Rest, 1983). Consequently, more measures are available to

assess levels of moral reasoning than any other component. The original measure of moral reasoning was developed by Kohlberg (1958) to measure his six stages of moral development. It was called the Moral Judgement Interview (MJI) and took the form of a semi-structured interview where respondents had to answer questions orally on a series of hypothetical moral dilemmas about social issues. Subsequently, several other measures were developed based on the same premise but with the aim of being more easily administered to large numbers of people simultaneously. These include the Defining Issues Test (DIT) (Rest et al., 1974), the Sociomoral Reflection Measure (SRM) (Gibbs et al., 1982), the Ethical Reasoning Inventory (ERI) (Page & Bode, 1980) and the Moral Judgement Test (MJT) (Lind, 1985). The SRM and the ERI are referred to as production measures and the DIT and MJT are referred to as recognition measures. Production measures require the respondent to spontaneously produce the reasoning behind their responses to the moral dilemmas posed whereas with the recognition measures, potential reasons are provided and these are rated by the respondent as to whether they were important in their decision making or not. These measures provide validated standardised measures for researchers to evaluate their subjects with, and allow comparisons between, disciplines. For a thorough evaluation of these tests, see Chapter 2.

The components of moral development reviewed here are restricted to those of ethical sensitivity and moral reasoning. Moral reasoning has been extensively researched and there are many tests available with which to measure it. Research on ethical sensitivity on the other hand is at a much more primitive stage and availability of suitable measures for use with veterinary students is limited, with the TESS providing a viable option. Further investigations into the suitability of the various moral reasoning measures for veterinary students need to be carried out.

1.3.5   Educational approaches to ethics teaching

1.3.5.1 Educational approaches that aim to improve general ethical development

The majority of the literature relating to improving ethical development in students of professional courses is from the field of medicine, with studies relating to ethical development in veterinary medicine being confined to one research group in the USA. Specific courses used to aid ethical development in veterinary medicine have become more

widespread in the last ten years (Dich et al., 2005; Hanlon, 2005; Rutgers, 2011). Often the aims of these courses are to improve general ethical development and they do not cite a specific component of morality (as per Rest's 1983 model). One such veterinary course on which published information is available is that taught at the University of Copenhagen (Dich et al., 2005). Here, the veterinary ethics course aims to provide students with tools to recognise and reflect on ethical questions related to the veterinary profession and to the human use of animals. It is made up of lectures which include perceptions of both a veterinarian and a philosopher on various topics; exercises themed around real ethical dilemmas experienced by the veterinarian followed by group discussion; and group based project work, where students have to analyse a veterinary issue from at least two ethical viewpoints. This appears to be a well-rounded approach to veterinary ethics teaching, utilising a variety of teaching methods and incorporating learning outcomes based on the skills outlined in Section 1.3.2. Although the impact of the course on students' ethical development has not been measured, evaluation of the course was provided in the form of student feedback. Ethics was perceived as important to their studies. Many students gave positive feedback on the ethics teaching being in the early part of the course as they felt it gave them sufficient time to reflect on ethical issues they are likely to encounter before having to confront them (in clinical practice) (Dich et al., 2005).

Ethics teaching at the Faculty of Veterinary Medicine in Utrecht incorporates both animal and veterinary ethics (Rutgers, 2011). Here, they use an approach called the Reflective Equilibrium Method with the aim of enhancing students' moral decision-making abilities. To make a defensible moral decision four actions are required under this model: identify one's moral intuitions towards the dilemma; search for applicable moral principles to resolve the dilemma; search for morally relevant facts of the dilemma and then balance these three elements until equilibrium is reached (i.e. the dilemma is resolved). The moral principles students are asked to consider are *beneficence*, *non-maleficence* and *respect for animal integrity*. These are most likely based on the bioethical principles developed by Beauchamp & Childress (1974), though they are not explicitly referred to in the paper. *Respect for animal integrity,* it can only be assumed, is used in place of *respect for autonomy* and there is no mention of *justice*. In Dutch law, animals are regarded as having intrinsic value. This seems in keeping with the veterinarian's oath that animal welfare should be the first priority and therefore, *respect for animal integrity* is a viable alternative to *respect for autonomy* for use in a veterinary context. The Reflective Equilibrium Method is a basic tool for helping veterinary students learn moral reasoning skills but no empirical evidence is available to determine whether it is beneficial in practice.

Although not designed explicitly for veterinary students, the ethical matrix (Mentham, 2005) is a tool that was designed to aid in teaching ethics, which could be used in veterinary scenarios. The ethical matrix, as its name suggests, provides a matrix of different parties and how their interests may be affected by a proposed action. Through discourse, it helps to identify impacts on all the parties before making decisions on ethically difficult dilemmas. Like some other approaches, it centres on the principles of bioethics (with *beneficence* and *non-maleficence* being combined to represent well-being) (Beauchamp & Childress, 1974). The ethical matrix very likely improves ethical awareness but no studies have been undertaken to test its impact on cognitive components of ethical development.

At present, only one resource is publicly available that was specifically developed for teaching ethics to veterinary students, the Animal Ethics Dilemma (Hanlon et al., 2007). The Animal Ethics Dilemma is a computer based tool that encourages students to reflect on difficult ethical decisions involving animals and is based around five contemporary animal ethics theories (this resource is discussed in more detail in section 1.4.2.2).

Outside of veterinary medicine, a course run at the University of Glasgow medical school assessed the effects of a new ethics curriculum where students were exposed to small group discussions in addition to lectures on ethical topics (Goldie et al., 2001). The researchers used a medical-specific tool called the Ethics and Health Care Survey Instrument (EHCSI) to measure 'potential ethical behaviour'[3] of first year medical students. The EHCSI comprises of 12 case vignettes which contain medical ethical issues. The respondent has to choose one action from a list of options and justify their choice. Students were tested using the EHCSI, underwent the ethical teaching described above, and then were re-tested using the same instrument. Any change on the EHCSI was measured by checking if students' answers were consistent with 'consensus professional judgement' (i.e. agreement by a number of experts as to what they would have done) on the ethical dilemmas outlined. The number of post-test consensus answers was significantly higher in the group that underwent the new form of ethics teaching, indicating a positive impact on their 'potential ethical behaviour' and that small group teaching was more effective than lectures alone.

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[3] Chosen action indicates what student would do if the scenario were not hypothetical.

Goldie and colleagues (2002, 2004) followed these same students through to their fifth year of medical school. No further improvement in students' 'potential ethical behaviour' was found (as measured by the EHCSI at the end of third and fifth year); the highest score was recorded after year one. The authors concluded that the increase was mainly due to the teaching methods used; in first year small group teaching is the main format, whereas lectures and large group teaching are the main formats in subsequent years. This result lends support to the use of small group teaching to improve ethical development. One reason suggested for the lack of continuing improvement is 'moral enculturation'[4] (a phenomenon often present in medical courses) (Hafferty & Franks, 1994). Impacts of moral enculturation have never been studied in veterinary clinical environments but it is likely that there could be similar effects as is indicated by Paul & Podberscek's (2000) research where they found that empathy decreases in male veterinary students as they progress through the veterinary course. The EHCSI was specifically designed for use in medicine and it would be useful to have a similar, subject-specific measure for veterinary medicine.

1.3.5.2 Educational approaches that aim to improve ethical sensitivity

Ethical sensitivity is the the ability to recognise ethically relevant issues within a scenario (Clarkeburn, 2002). Relatively few studies have looked at ethical sensitivity in the professions. Currently, there are no published studies on the ethical sensitivity of veterinary students and no veterinary-specific measure available. Studies have been carried out on dental students in the USA (using the DEST) and scores have been found to increase after ethics instruction (Bebeau & Brabeck, 1987). Details of the instruction were that it was a five week course in professional problem solving, though details of the number of contact hours were not provided. Improvement in ethical sensitivity through instruction has also been seen on the Quick Racial Ethical Sensitivity Test (Quick-REST) (Sirin et al., 2010) where student teachers were given one day of cultural sensitivity training in between tests.

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[4] Moral enculturation can be thought of as the development of character by the experiences of others' behaviour (ethical or unethical) in hospitals and the view that norms are morally right.

To test curricular effects in medicine, four clinical vignettes were presented to students in all four years of medical school at the University of Toronto (Hebert et al., 1992). Students were asked to list the ethical issues related to each vignette and their responses were categorised using three of the principles of bioethics (Beauchamp & Childress, 1974) – *respect for autonomy*, *beneficence* and *justice*. Using this measure, ethical sensitivity increased between first and second year but decreased subsequently i.e. fourth year students identified fewer ethical issues in the vignettes than first year students. The first year students had undertaken a short course on ethics and no further teaching on ethics was carried out in the remainder of the course. The authors suggested that the lack of reinforcement of ethics teaching later in the course may have resulted in the decline and this is supported by similar results in medical students in the UK (Goldie et al., 2002; 2004). This indicates that some aspects of ethical development do not automatically progress during university education if ethics teaching is not maintained. Although the methods used followed accepted methodology (panel of experts picking scenarios with relevant ethical issues then categorising the responses), Hebert and colleagues (1992) listed several limitations of their measure, including the expert panel being of the same race and gender (all white males); questions around construct validity (whether ethical sensitivity was being measured accurately); and indecision as to whether they had applied the bioethical principles appropriately. This lengthy list of limitations may indicate poor study design but also supports earlier evidence of the difficulty of accurately measuring ethical sensitivity in practice.

Vignettes were also the approach used by Clarkeburn (2002) when investigating ethical sensitivity in life sciences students using the TESS. Clarkeburn exposed one group of students to three, structured, two-hour long group discussions that centred on an ethical theme such as the use of animals in bioscience research. A second group did not participate in any ethics tuition. The results showed that ethical sensitivity was significantly higher in the group that had had the ethics instruction. Unlike Hebert and colleagues, Clarkeburn (2002) limited the number of issues students were asked to identify to five. Presumably this was done to encourage inclusion of the most important issues. Clarkeburn did not specify that these issues had to be ethical in an attempt to ascertain whether students would identify ethical issues ahead of those of scientific or clinical relevance (Hebert did). Informing students there are ethical issues within the scenario could bias the measure. Clarkeburn also graded responses on a 0 to 3 scale, which Hebert did not do, with more ethically complex responses scoring higher marks and non-ethical responses scoring zero.

This provides additional information as to what level of response students most commonly produce.

Categorising ethical issues by level of complexity is one possible approach but frameworks are also often used (Hebert et al., 1992; Rutgers, 2011). A study on nurses in Turkey, which categorised responses in relation to the bioethical principles, found that ethical sensitivity of nurses to the relevant principle was dependent on the scenario presented in the vignette (e.g. in one scenario the majority of nurses did not recognise the principle of patient autonomy but in the second scenario the majority did) (Ersoy & Goz, 2001). This is one disadvantage of the use of vignettes (though it may be realistic as professional dilemmas are never exactly the same). The authors felt that knowledge of ethical decision making models such as the bioethical principles was lacking in these nursing students and suggested that using case-based examples could improve ethical skills.

Few studies have looked at the effect of educational interventions on ethical sensitivity specifically and all of these studies have taken place outwith veterinary medicine. Results of the studies that have taken place indicate that modest instruction can improve ethical sensitivity, though the approaches have been limited to ethics courses, some with elements of group-discussion. Frameworks, such as the bioethical principles, have been heavily relied on as a useful tool in ethical educational approaches. Animal ethics frameworks have rarely been used but would serve as the most relevant frameworks for veterinary students.

1.3.5.3 Educational approaches that aim to improve moral reasoning

Curricular effects

Moral reasoning has been the most frequently studied component of moral development because reproducible results from accessible, standardised tests have allowed several empirical studies to be carried out. Of these standardised tests, the most widely used has been the Defining Issues Test (DIT) (Rest et al., 1974). Numerous studies using the DIT have been carried out on university students to investigate curricular effects including degrees in nursing (Duckett et al., 1997; Kim et al., 2004), dentistry (Bebeau & Thoma, 1994; Chaves, 2000), pharmacy (Latif & Dunn, 2004) and medicine (Sheehan et al., 1980). Educational interventions were not applied in these studies but in both nursing studies, significant gains were found between the DIT scores of first and fourth year students, and

in medical students between first and third year students. By contrast, in dentistry and pharmacy no gain was found between first and third year students.

One of the most influential authors in relation to teaching ethics in US medical and veterinary schools is Donnie Self. The majority of Self's research has focused on moral reasoning development. In his first longitudinal study on moral reasoning abilities in veterinary students, the MJI (Kohlberg, 1958) was used to assess 20 students' moral reasoning levels at the beginning and end of their veterinary education (Self et al., 1991). There was no significant increase in moral reasoning scores during this period, indicating that veterinary education did not result in the expected improvement in scores as per the DIT norms (Rest, 1993). The study was carried out on a small number of students and within this small sample there was wide variation in scores (scores ranged over 123 points on a scale of 500) which would make statistical significance unlikely. Tracking individual students and their respective increases may have provided more information.

A couple of years later, a follow up study was done, this time using a different measure of moral reasoning, the SRM (Gibbs et al., 1982) and a larger number of students (n=57) (Self et al., 1993b). A statistically significant difference was found between the scores of the same cohort of students in first and fourth year, with fourth year students scoring higher ($p < 0.05$; 340.86 and 358.40 respectively). This disagreed with the result of the previous study but is not directly comparable because a different test was used to assess moral reasoning ability. The SRM measures moral reasoning up to the conventional level (not the highest level, post-conventional). This is not made clear in the paper. It is post-conventional level moral reasoning that is strongly linked to 'desired professional decision making' (Rest et al., 1999) so this level is the level where gains are particularly sought.

In the third and final longitudinal study on veterinary students by this research group, moral reasoning in veterinary students was examined using the DIT (n = 98) (Self et al., 1996). Again, DIT scores were obtained from the students in first year and at the end of their fourth year. There was no increase in score between first and fourth year students (mean first year score = 44.0, mean fourth year score 45.4). However, a significant correlation between score and gender was found, with females scoring higher than males. As with the previous DIT study there were large variances in scores (first year range 8.3 to 70.0, fourth year range 16.7 to 76.7). The results show that veterinary medical education, at least for the curriculum under study, does not advance moral reasoning development as expected. All of these students also participated in a veterinary ethics course involving

group discussions, a tool that often results in an increase in moral reasoning score on the DIT. However, this was not the case here. These results support the notion that veterinary students become less open to ethical development as they go through the years, which may be related to the nature of veterinary education but may also be linked to factors such as decreasing empathy (Paul & Podberscek, 2000) and students' perception of the need for 'hardening'.

Intervention effects

Courses in ethics have been used in an attempt to improve moral reasoning in undergraduates. In the first longitudinal study of medical education, Self & Olivarez (1996) followed students over their entire medical degree to see whether a first year course in medical ethics could improve their moral reasoning ability. They used the DIT to measure changes before and after the course, then at the end of each of the subsequent four years. The educational intervention resulted in an increase in moral reasoning scores in first year students but there were no further increases in future years of the course (though the initial increase was retained). This indicates that it is possible to improve moral reasoning with relatively little intervention. And as with previous studies (Hebert et al., 1992; Goldie et al., 2002), it supports the introduction of ethics teaching as early as first year. The scores at the end of first year were high so there may have not been room for further improvement. One problem that became apparent from this study is the difficulty of retaining study participants for the length of a longitudinal study (only 26% of the original students completed all five DITs). Thus, studies of this type are often restrained by small sample sizes and self-selection.

In contrast to medical students, the mean DIT score of first year veterinary students was no different following a short ethics course that included lectures and small group case studies (Self et al., 1995). The course was 15 hours long which may have been too short to have an impact. The effective medical ethics course comprised 44 hours over 22 weeks (Self et al., 1992), and it has since been found that a minimum of 20 contact hours are needed to improve moral reasoning development (Self et al., 1998b). It is difficult to understand why veterinary students do not seem to achieve gains seen in students of other professions. Speculative reasons may be that particular characteristics of veterinary students make them less receptive to ethical educational interventions or that the selection of veterinary

students inadvertently favours students with lower than expected moral reasoning ability. There is also the possibility that moral enculturation within the veterinary course affects students' moral development. Alternatively, the motivation of veterinary students to complete the DIT may be lacking due to their extremely heavy workload and their focus on passing exams or that the irrelevance of the dilemmas presented in the DIT to veterinary work affects their judgement.

A more unusual pedagogical approach was adopted by Penn (1990). He taught arts, sciences and humanities students the foundations of moral reasoning including the stages of moral development theory, logical reasoning skills, and how to apply ethical theories when analysing social issues; an approach based on directly teaching moral reasoning. Normally students would discuss and analyse example ethical dilemmas with the aim of improving moral development, a somewhat indirect approach. Penn's direct approach was highly successful and resulted in large increases in DIT scores (from 41.7 to 50.6). In accordance with the DIT norms (Rest, 1993), the degree of change seen in scores would normally be expected as a result of a degree's worth of formal education and according to Penn, effect sizes almost twice those of other successful studies were seen. However, it could be said that by teaching students in this direct way you are teaching them how to tackle the DIT and they may have a less rounded ethical knowledge. Penn concludes that his approach, as opposed to group discussion of ethical dilemmas, is the most effective way to promote moral development. However, it is questionable as to whether veterinary students (or students of other professions) would readily engage with this type of approach as it has limited relevance to their practice.

A difficulty with assessing the impact of courses on ethics lies in identifying the effective part of the course. It is easier to assess the success of more specific educational interventions as courses vary in length, group dynamics and tutor input. Motivation to learn from a course will also differ depending on assessment procedures (Donaghy & Morss, 2007).

Group discussion of case studies involving ethically difficult situations are a common way of teaching ethics, and in particular of trying to improve the moral reasoning component of ethical development. In a myriad of professional courses, group discussion of ethical dilemmas has been used as the main tool to improve moral reasoning abilities. In a comparison of two teaching approaches (Self et al., 1989), the impact of lecture-based teaching and lectures plus case-study discussions on moral reasoning was measured using

the SRM (Gibbs et al., 1982). The teaching improved first year medical students' moral reasoning regardless of the teaching format. Although the result was not significant, students achieved greater gains in score when taught in small groups rather than by lecture. These results were one of the first indications that small group teaching had a positive impact on moral reasoning. In another study by the same research group, medical students taking an elective course which involved discussion of social issues in medicine had significantly higher moral reasoning scores on the DIT after the course compared to those not taking the course (Self et al., 1993a). However, the self-selection of students to take part in the elective course could have biased the results.

In second year pharmacy students, the DIT was used to examine whether a communications course, where students had to defend a particular position, would impact their moral reasoning ability (Latif, 2000). Students scored significantly higher after having participated in the course. In addition, there was a correlation between higher moral reasoning level and an improved ability to cope with dilemmas (students perceived common ethical dilemmas as less problematic). This is a notable result in relation to reducing stress as a result of dealing with dilemmas in veterinarians.

A similar approach was used with law students (Hartwell, 1995) where students had to participate in a number of client-lawyer role-plays involving ethical dilemmas. Students were tested with the DIT before and after the module. The use of role play, along with group discussion had a positive effect on the students' levels of moral reasoning. Role play has been used in veterinary medicine to teach communication skills (Brandt & Bateman, 2006) and Reiss (2005) suggests that it may be a suitable way to teach ethics as it is likely to be memorable. Role-play allows students to experience the reality of their professional role and may help them to see others views more clearly, especially when asked to defend a view they do not agree with.

In a later comparative study (Smith et al., 2004), an improvement effect as a result of group discussion was found with third year medical students. This study compared written case analyses to written case analyses with group discussion. Students completed analysis of four cases. The measure used was developed by the authors and involved recognition as well as reasoning measures. Participation in group discussion resulted in higher total scores as well as higher absolute increases in scores, indicating a beneficial effect of participating in the group discussion.

The popularity of using group discussion to teach ethics is likely because it was found to be widely effective. Group discussion of case-studies improves moral reasoning (and ethical development in general) because it provides a platform for students to develop important skills such as reflecting on and respecting others views, and as a result possibly re-examining their own views. It allows students to be active learners (contributing arguments to defend their views) and to practice problem solving (Huff & Frey, 2005). The process of discussion may also expose them to novel or more complex arguments made by classmates that they had not thought of (Latif, 2000). This may lead to 'cognitive dissonance' (mental conflict) within students, a state that is often thought to precede moral development (Self, 1993). Importantly, all the successful studies discussed above used subject-specific dilemmas within the case-based discussions. This helps to ensure content remains relevant to students and keeps them engaged (Reiss, 2005).

Summary of educational approaches to ethics teaching

Twenty years ago there was little evidence that ethics teaching could impact students' moral development (Bebeau, 1993). Since then, several studies have highlighted that moral development components can be improved through educational interventions centring on ethics. Most of these studies are based on students in professions outwith veterinary medicine. There are few published papers on approaches to ethics teaching in veterinary medicine and those described have not been externally validated (Dich et al., 2005; Hanlon et al., 2007; Rutgers, 2011). Self's research group has lent much needed information to research on moral reasoning in veterinary students. The indication is that veterinary education leads to impaired ethical development and that interventions effective in other professions do not have the same positive effect on veterinary students. This suggests that alternative teaching approaches need to be explored.

Studies that found increased levels of moral reasoning were all based on the same approach - group discussion of subject-specific case-studies. Although evidence for the value of using case-study discussions is unequivocal, using this approach is time-consuming, and staff intensive (for example if there are a large number of students, teaching may have to be repeated several times). With staff-student contact time already under pressure it is appropriate to consider using alternative methods of promoting ethical development and consider the use of self-directed learning or computer based learning where the student

takes responsibility for their learning and can work through exercises with minimal tutor input.

1.4   Teaching approaches that encourage lifelong learning

When considering alternative methods for teaching ethics, approaches that relate to independent, lifelong learning[5] will be of value. Ethics is not about learning 'the right answer', but rather synthesising knowledge and understanding theories in order to apply ethics in practice. This requires a deep learning approach where knowledge and application are integrated and lifelong learning approaches facilitate this. Lifelong learning emphasises taking the responsibility for one's own learning. Self-directed learning, where learning is directed by the learner rather than by a tutor, is one such approach and the ability to learn independently of guidance is necessary in professional roles (Raidal & Volet, 2009). Blumberg (2005) suggested that the excessive content in the veterinary course prevents students from engaging in self-directed learning. She emphatically states that more effort needs to be put into developing self-directed aspects of the curriculum. A survey carried out in an Australian veterinary school also found strong support for increasing the amount of self-directed learning in the veterinary course (McLennan, 2003).

Problem based learning (PBL) is probably the most popular form of self-directed learning in professional courses. PBL is an effective teaching method because it provides a relevant context for learning and students are actively involved in solving problems in a similar way to professional practice (Collins, 1997). In this sense, it fosters lifelong learning skills. PBL helps to integrate pre-clinical science into clinical problems, develops self-directed learning skills, increases retention of knowledge and can increase students' interest in the subject (Canfield, 2002; Lane, 2008). There are many instances of the use of PBL in veterinary education (Farnsworth, 1997; Rand & Baglioni, 1997; Canfield, 2002; Howell et al., 2002; Lane, 2008) and in relation to teaching ethics, Hanlon (2005) gives an overview

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[5] Definition of lifelong learning from Collins' English Dictionary is "the provision or use of both formal and informal learning opportunities throughout people's lives in order to foster the continuous development and improvement of the knowledge and skills needed for employment and personal fulfilment".

of the use of real-life case studies to teach ethics and animal welfare to pre-clinical veterinary students at University College Dublin. PBL studies in veterinary medical education tend to be evaluated using an informal approach based on student feedback (Rand & Baglioni, 1997; Canfield, 2002; Lane, 2008). PBL requires foundation knowledge of the subject (Williams, 1999) and students early on in their degree may not have sufficient knowledge to tackle this type of learning. An alternative approach to teaching ethics that allows students to explore their own feelings, use their own experiences and apply them to ethics may be more beneficial for pre-clinical students. Reflecting on experiences is one such approach.

1.4.1 Reflection

The concept of reflection was first defined by Dewey (1910). Reflection is a key lifelong learning skill. A definition of reflection often cited is that of Boud and colleagues (1985): "those intellectual and affective activities in which individuals engage to explore their experiences in order to lead to new understandings and appreciations" (p. 19). Reflection is a means of turning an experience (often a negative one) into a positive learning experience which allows the learner to approach the next learning experience with a new found understanding. This process facilitates exploration of confusing, upsetting, unexpected and extraordinary events and the thoughts and feelings they produce (Boud 2001). Schon (1983), who led the way in establishing the importance of the role of reflection in professional practice, coined the terms reflection-in-action and reflection-on-action. Reflection-in-action refers to reflection that occurs concurrently with action whereas reflection-on-action happens after the event. Reflection-in-action is often used by those working in professional practice. The latter is more relevant to students who are not yet in practice (Tate, 2004).

The postulated benefits of reflection are plentiful. It allows students to take control of their own learning needs and can facilitate deeper learning (Wald et al., 2009), or further learning from experiences that may not be explored otherwise, and in this sense can minimise negative effects of negative experiences. It also encourages consideration of many perspectives and promotes the development of critical thinking skills which are essential in clinical practice (Plack et al., 2007).

While reflection has not been used to teach ethics in veterinary medicine, the concept of reflection has been used to identify ethical issues confronted by medical students during clinics. Three papers describe using reports of students' experiences to identify where ethical issues are most commonly seen during rotations (Huijer et al., 2000; Caldicott & Faber-Langendoen, 2005; Fard et al., 2010). They revealed that ethical issues within medical education often contribute heavily to those issues recorded. In Fard and colleagues' (2010) study, the most commonly cited ethical issue confronted was 'ethics in medical education' (examples being maintaining quality of care when teaching students and the student's role in confronting medical team error). Surprisingly, the authors dismissively state that this category is 'not considered essential for medical practitioners' but arguably these practices help shape students' views of normal practice and therefore impact their ethical development. Furthermore, Caldicot & Faber-Langendoen (2005) focused on three areas they thought influenced ethics education in one US medical school: deliberately lying, discrimination and students' reluctance to speak up about ethically questionable practices for fear of reprisal. Recording the issues experienced by veterinary students in a similar way could have two sizeable benefits: 1) it could provide information on the types of ethical issues faced by veterinary students during practical experience and 2) more importantly, giving students opportunities to reflect on ethically problematic experiences could help them to cope with emotionally difficult situations.

The papers mentioned above used reflection as a tool to identify ethical issues experienced in a clinical setting but only one published study uses reflection as a measure of moral reasoning. The Ethical Reasoning Test for nurses (McAlpine et al., 1997) is based on an amalgamation of prominent theories of moral growth including Kohlberg (1976), Rest (1982) and Perry (1970) but levels of reasoning are categorised into traditional and reflective responses; the three levels used were traditional, traditional/reflective and reflective. A traditional response would be one which had features of pre-conventional reasoning such as obedience to others. A reflective response was one which incorporated more desirable aspects of ethical reasoning than the other levels, (and were similar to those described as post-conventional by Kohlberg (1958)) e.g. use of ethical frameworks, willingness to challenge unethical practises. First year nursing students were asked to submit a written reflection on the same ethical case study before and after a course in ethics. The results showed improvements in three components of ethical reasoning (recognition of ethical issues, use of an ethical framework, and use of personal values to direct decision making) and consequently, an improvement in levels of reflection from traditional (pre-course) to traditional/reflective (post-course). The approach used indicates

that reflection can be used to improve moral reasoning, albeit in this case to a relatively low level. The components used here are specific to nursing but the approach could guide a reflection-based approach for improving veterinary students' ethical awareness. It also demonstrates that levels of reflection could be used as a measure of moral reasoning.

1.4.2   Experiential learning

Written reflections are normally based on personal experiences, and consequently reflection and experiential learning (learning through one's own experience) are inextricably linked. Veterinary medicine is a very practical subject and experiential learning is therefore an important part of veterinary education. Experiential learning is vitally important once students embark on clinical education (Miller, 1997) and exposing students to this form of learning as early on in the curriculum as possible will be of great benefit to them. In one of the first recorded studies of experiential learning in veterinary education, students at Murdoch University took part in a programme involving 'foster farms' (Swan et al., 1982) where they were assigned a farm to evaluate and improve by working with the farmer. Other studies refer to elective placements (Malone et al., 2009), computer based resources (Conrad et al., 2007; Dyson, 2003), and courses that use experiential learning to improve animal handling (Reiling et al., 2003; Marshall et al., 1998), veterinary epidemiology (Hueston, 2003) and communication skills (Brandt & Bateman, 2006; Adams & Ladner, 2004). All were evaluated through student opinion gathered through feedback questionnaires. None use a learning cycle, such as Kolb's experiential learning cycle (1984), as an evaluation tool. Kolb's experiential learning cycle, which is based around the process of experiential learning and reflection, is a four-stage cycle that starts with a concrete experience, which provide a basis for reflective observation (reflecting on how one felt about the concrete experience), that leads one to develop an abstract conceptualisation (developing one's understanding further and forming new ideas) and finally applying one's new knowledge through active experimentation (Figure 1.1). The cycle is continuous with active experimentation feeding into the next concrete experience and another cycle. The Kolb cycle has been suggested as a relevant model to help students negotiate the clinical years of medical education with emphasis on its relevance in the transition from pre-clinical study to clinical study (Greenberg & Blatt, 2010) but no empirical evidence has been provided. Similarly, it has been used in an attempt to aid engineering students' learning of mathematics (Stice, 1987) but again no

evidence of improved retention of knowledge was provided. An alternative reflective framework, Johns' framework, was used to assess levels of reflection in student writing (Pee et al., 2002). Johns' framework (1994) consists of five steps (description of experience, reflection, influencing factors, could I have dealt with the situation better and learning) under which are listed a series of questions that the student should address. Student reflections were analysed for evidence that the question had been addressed and marked accordingly. The framework was found to be suitable for assessing the process of reflection and gave the researchers insight into which aspects of the reflection were commonly achieved and which were not addressed. Due to its detailed nature it was not suitable for assessing levels of reflection. Other drawbacks of using this framework were that it was time-consuming to assess and it was designed for supervised reflection (Pee et al., 2002). Contrastingly, the Kolb cycle could provide a simpler, easily interpretable framework around which a reflective exercise could be structured and the content of the reflections could provide evidence as to whether students complete cycles of reflection (as in Pee et al., 2002).
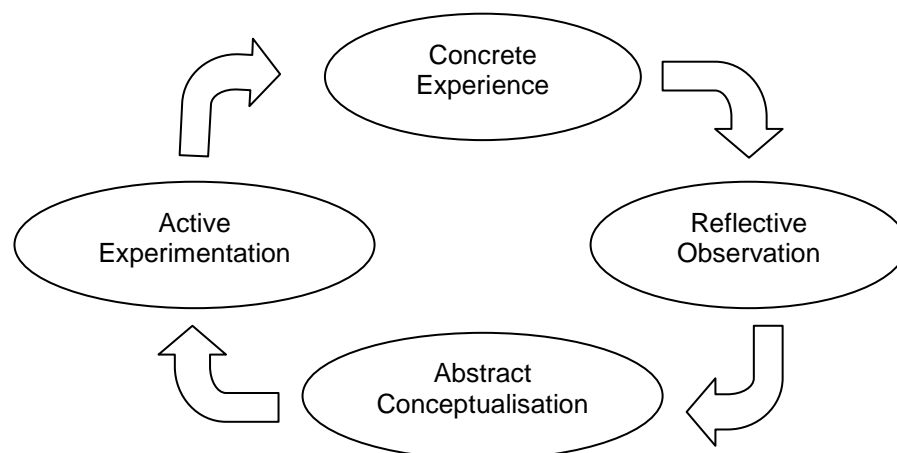
Figure 1.1: Kolb's (1984) experiential learning cycle

1.4.2.1 Pre-clinical Extra Mural Study

One aspect of veterinary education in the United Kingdom (UK) which is a major strength in regard to experiential learning opportunities is Extra Mural Study (EMS). EMS is the practical, on-the-job experience that undergraduate students do outside their formal studies at university. EMS is split into pre-clinical EMS (PC-EMS) and clinical EMS. Veterinary undergraduates in the UK are required to complete 12 weeks of PC-EMS within their first

two years of study. In these 12 weeks they are encouraged to gain as wide an experience as possible in different animal establishments such as sheep farms, stable yards, dairy units and kennels. The principle aim of PC-EMS is to provide students with practical experience of animal handling and to introduce them to the methods used in different husbandry systems.

One criticism of EMS is the variation in its quality as it is not presented in a controlled environment like veterinary school. However, this could also be said to be one of its strengths (Taylor & Barnes, 1998b) as it provides students with a vast range of experiences, some good, some bad, which all contribute to the learning experience. One survey looked at graduates' opinions on the importance of EMS in teaching ethics and welfare (Fitzpatrick & Mellor, 2003). EMS was found to be 'fairly valuable' (the midpoint on a five point scale). This survey was done before formal ethics teaching had been introduced to the curriculum, and students may have failed to recognise ethically relevant situations during EMS. EMS has been rated as very useful for developing other graduate attributes necessary for successful work as a veterinarian, e.g. communication/observation skills, procedural skills, history taking/data gathering (Baguley, 2006).

The SILVER (Supporting Independent Learning in Veterinary Extramural Rotations) project, which aimed to enhance the quality of learning from EMS, stated that EMS is often where "values and attitudes can be shaped and inculcated" (Taylor & Barnes, 1998a). In addition, anecdotal reports suggest that students often have 'spontaneous moral reactions' towards certain events witnessed during EMS; that is they have a strong, immediate emotional reaction to something that strikes them as distasteful or morally wrong (Ohman & Ostman, 2008). This emotional expression is not easily suppressed and is not accompanied by rational thought. Spontaneous moral reactions sometimes referred to as 'moral emotions' (Haidt, 2001) are considered important inputs to moral judgements (Kohlberg, 1958).

The indication is that EMS can play a major role in the formation of students' perceptions of standard practice and therefore is playing an informal role in their ethical development. Students may experience welfare issues and unethical practices for the first time during PC-EMS leading to upset and distress. Students may leave PC-EMS placements having dealt with difficult situations and at present there is little done to help them cope with their experiences. Providing students with formal opportunities to reflect on these experiences

and their ethical basis could lead to positive learning outcomes and improved ethical development.

1.4.2.2 Computer Assisted Learning

A popular teaching aid often used to support students' experiential learning is the use of Computer Assisted Learning (CAL). The earliest record of CAL being used in veterinary medicine was the introduction of the PLATO computer system which simulated the conversation between the veterinarian and a client (Grimes et al., 1974). This was closely followed by a canine cardiology teaching aid (Musselman & Grimes, 1976). In 1993, a project was initiated to establish the use of CAL in veterinary medical education. This project, CLIVE (Computer-Aided Learning in Veterinary Education) resulted in several CAL packages being created including a nerve block tutorial, digital lectures and case simulations (Holmes & Nicholls, 1996). The project was a success and there are currently 23 packages available on their website http://clive.ed.ac.uk/clive.html).

Since the inception of CLIVE several other CAL packages have been created to assist in veterinary educational programmes incorporating a range of different subjects, some assisting with practical learning (e.g. oestrus detection in dairy cows (Heuwieser et al., 1995), diagnostic procedures (Jergens et al., 2007) and preparing blood smears (Preast et al., 2007)), and others with more theoretical subjects (e.g. epidemiology (Conrad et al., 2007; Goutard et al., 2007), nutrition (Dascanio et al., 1997), parasitology (Pinckney et al., 2001) and anaesthesia (Dyson, 2003)). Computers have also been used to teach small animal husbandry (specifically the housing of cats and dogs in establishments such as boarding kennels and catteries) (Denwood et al., 2008) and to replace the use of animals in teaching (e.g. students shown how to pass a nasogastric tube in horses using a CD-ROM in place of a live demonstration (Abutarbush et al., 2006)) but there is only one example of using CAL to teach university students animal ethics. The Animal Ethics Dilemma (available at www.aedilemma.net) (Hanlon et al., 2007) is a web-based package that provides an interactive teaching approach to animal ethics. Students are presented with a series of ethical dilemmas and opinions analogous to five ethical frameworks (utilitarian, animal rights, contractarian, respect for nature and relational). Students first have to develop their ethical profile by answering 12 questions with 5 possible answers each relating to the five ethical frameworks. Participants can then work through a series of

dilemmas, in which they have to make choices as to what they would do in each situation, and depending on their choice they are then faced with additional complications. The complications are designed to challenge the users' views (as provided by the profile) and the package aims to encourage critical thinking about their attitudes to animals and their ethical basis. The tool has many good qualities: the interactive approach and creation of a personalised profile mean it is engaging for students; the pathway to a solution alters dependent on the choices made and forces re-evaluation of initial thoughts, exposing how troublesome real-life animal ethics dilemmas are; and it raises awareness of different perspectives and the use of frameworks, which are important in the early stages of veterinary students' ethical development if one wants to create post-conventional reasoners. Since its inception, the tool has been enhanced and students can now add their own case study (Hanlon et al., 2010). As yet, no scientific studies have been carried out to judge whether it improves ethical development. Feedback from students in the form of direct observations, face-to-face interviews and questionnaires was collected to evaluate the tool but the results are not publicly available.

Feedback on CAL programmes is a commonly used evaluation tool (Ito et al., 2001; Dyson, 2003) however the validity of this approach has been questioned (Jones & McCormac, 1992; Brandt & Bateman, 2006). Feedback, usually in the form of student evaluative questionnaires, is often used because it is an easily implemented measure and students' perception of the programme is of importance to their engagement. Validating CAL programmes using outcome based measures may be more valuable for reliably assessing the pedagogical objectives. CALs have been shown to improve practical skills (Abutarbush et al., 2006; Preast et al., 2007) as well as knowledge (Heuwieser et al 1994; Jergens et al., 2007). The most comprehensive approach is to use both outcome measures and student evaluations as it is important that as well as meeting the expected learning outcomes that students are keen to engage with the programme.

There are numerous advantages to using CALs: they can save staff time (Dewhurst & Williams 1998), are usually easy to update (Dyson, 2003), they allow students to work at their own pace (Conrad et al., 2007), and they can replace practical classes involving animals so have welfare and ethical advantages (Dascanio et al., 1997; Dale et al., 2005; Abutarbush et al., 2006). Criticisms of CALs are that they can be used for inappropriate material (Trynda, 1979) and feedback often finds support for their use as a supplement to traditional teaching rather than a replacement of it (Dascanio et al., 1997; Dewhurst & Williams 1998; McLennan, 2003; Dale et al., 2005). There is also a culture of 'not

invented here' syndrome which prevents integration into others' curricula (Jones & McCormac, 1992).

In this age of technology, where students are familiar with using online material for research and study, CALs seem like an appropriate approach to take when designing new teaching tools or supporting material. The evidence for their use is supported by a number of successful studies in veterinary medicine (Holmes & Nicholls, 1996; Abutarbush et al., 2006; Jergens et al., 2007; Preast et al., 2007; Denwood et al., 2008).

1.5 Aims

The evidence from the literature clearly points to the need for improvement in ethics education in veterinary medicine. Despite the ethically challenging nature of veterinary medicine as a profession, very few approaches that have been developed for teaching ethics are specific to veterinary students. Those that are available have not been evaluated using scientific measures of ethical development. Research that has investigated veterinary students' ethical development has focused on a single aspect of ethical development (moral reasoning) and is confined to the USA (where little ethics teaching is included and students are college graduates on entry to the veterinary course). The results of these studies indicate that veterinary education does not have the desired impact on moral development and educational ethics interventions have not rectified this. Introducing ethical concepts early in the veterinary course is supported by the many studies reviewed using first year students from other disciplines that found improvement in ethical development (and retention of that development) as the result of short, early educational interventions. Educational interventions that centre on lifelong learning skills such as self-directed learning, reflection and experiential learning have not been attempted in an effort to improve ethical development in veterinary students. There is an urgent need for ethics educational tools and approaches designed specifically for veterinary medicine.

The primary aim of this study was to create a self-directed learning tool, which through the use of reflection would improve ethical awareness in pre-clinical veterinary students. Ethical awareness can be described as familiarity with ethical concepts such as parties, interests, perspectives and frameworks. It is not a term that is used in the literature or which has established measures attached to it. To this end, in this project the improvement

of ethical awareness, in addition to textual analysis, is assumed by representative measures of ethical development and ethical reflection. This novel approach to teaching ethics to pre-clinical veterinary students will have animal welfare at its core and will take the ideas of self-directed learning, experiential learning and reflection and combine them in an exercise that can develop lifelong learning skills. This approach has not previously been attempted with veterinary students. The tool will be developed using ideas from the healthcare professions where reflection has been used more widely. The tool will take the form of a structured reflection and it will be accompanied by a computer based teaching package. Students will be asked to identify relevant animal welfare issues on farms from their own PC-EMS experience upon which to reflect. As well as the aim of aiding ethical development, this will also provide an insight into the types of welfare issues seen on EMS by pre-clinical veterinary students. Students will be free to choose the welfare issue for reflection. Allowing students to use their own experience will make it more meaningful and therefore should maximise the learning gained from their PC-EMS placements.

The aim will be to improve students' ethical awareness through reflecting on an ethically relevant animal welfare issue. Ethical reflection, as defined in this study, involves considering a situation from the standpoint of what is morally right and what is morally wrong, reflecting on the reasons that an action is morally right or wrong (which may include personal feelings), who is affected by the (proposed) action, in what ways are they affected by the (proposed) action, and what could be done instead/why should the action be advocated. The impact of the reflective tool on two components of ethical development (ethical sensitivity and moral reasoning) will be investigated to validate its effectiveness. Following development and validation of the learning tool, it will be offered to all other UK vet schools for use in their PC-EMS teaching programme. Further to the development of a PC-EMS tool, an investigation will be carried out to determine whether this tool can be adapted for use in clinical EMS. A secondary aim of the study was to provide baseline information on the moral reasoning abilities of veterinary students and veterinary professionals in the UK.

1.6 Thesis outline

Chapter 2 begins with a review of standardised tests of moral reasoning development in order that appropriate measures for validation of the proposed learning tool could be

identified. The remainder of this chapter first explores the usability of two of the reviewed measures for testing the moral reasoning abilities of first year veterinary students and then outlines the results of an investigation into the moral reasoning abilities of UK veterinary students at various stages of their veterinary education.

The development and pilot of a novel, reflective learning tool for pre-clinical veterinary students is outlined in Chapter 3. The tool was designed for use following PC-EMS placements on cattle, sheep and horse units, with the aim of promoting students' ethical awareness, encouraging ethical reflection and in turn improving students' ethical development. The prototype tool was designed to replace the unstructured reflection currently completed by students following PC-EMS placements. The prototype tool focuses on the ethical dimension of an incident impacting animal welfare witnessed by the student during their PC-EMS placement and is called the Animal Welfare Associated Reflective Exercise (AWARE). Creation of the accompanying teaching package is also described.

Chapter 4 describes the validation of the AWARE using a mixed-methods approach. This chapter describes in detail the techniques used to validate the tool as well as the results of both quantitative and qualitative analysis. The main aim of this work was to investigate whether the AWARE achieved its aim of improving the level of ethical reflection displayed in post-EMS reflections. In addition, student engagement and the impact of the AWARE on ethical sensitivity and moral reasoning were also explored.

Chapter 5 is split into two parts and gives details of collaborative work between the University of Glasgow and the University of Bristol. In the first part, the development and pilot of a combined animal welfare and ethics teaching package for pre-clinical veterinary students is outlined. In the second part, the concept of ethical reflection was used in a clinical setting. This part describes the results of a pilot study using clinical veterinary students that investigated structured, self-directed, reflective exercises as a way of incorporating animal welfare and ethics, and professional ethics into clinical EMS.

Chapter 6 returns to the concept of moral reasoning and investigates the moral reasoning abilities of qualified veterinary surgeons in relation to members of the public using a well-established test of moral reasoning. The results are discussed in light of the potential impact on animals, clients and the veterinary surgeons themselves.

Chapter 7 summarises the main findings of the research presented in this thesis and includes limitations and recommendations for future research and teaching.

Chapter 2 - Moral reasoning development in veterinary students

2.1   Introduction

Moral reasoning, one component of moral development, has been widely studied in students of professional courses. Moral reasoning is the process by which a person decides that one course of action is morally preferable. Professional decisions are rarely clear-cut and coping with difficult decisions requires good moral reasoning skills. Moral reasoning is a vital skill for those in the veterinary profession given that they often face ethically difficult situations where they have to balance the interests of animals, clients and themselves, e.g. providing the best treatment for an animal may not be possible if this is not what the client wants or can afford. Worryingly, there is evidence that UK veterinarians experience ethical dilemmas regularly (up to five times a week) and that dealing with them does not necessarily become less stressful with increased years of experience (Batchelor & McKeegan, 2012). Good moral reasoning skills allow veterinarians to make defensible decisions (rather than relying on common/routine practice) and logical ethical reasoning is likely to give veterinarians more confidence in their decision making ability (Morgan & McDonald, 2007). The key feature of moral reasoning is that skills are related to how decisions are made rather than their outcomes. Teaching veterinary students moral reasoning skills is likely to also help prevent decision making fatigue and reduce the stress caused by decision making (Batchelor & McKeegan, 2012).

The basis of moral reasoning measures are that students at different educational levels differ in their levels of ethical reasoning and that those at higher levels place greater importance on principled moral thinking (Rest et al., 1974). However, recent research suggests that professional curricula do not always improve moral reasoning ability (Self et al., 1991; 1996; Chaves, 2000; Latif & Dunn, 2004). If specific educational interventions focusing on ethics are introduced, most often an improvement in moral reasoning is seen (Penn, 1990; Self et al., 1992; Bebeau & Thoma, 1994; Self & Olivarez, 1996; Latif, 2000). Nonetheless, with veterinary students no improvement in moral reasoning at the post-conventional level was seen as a result of introducing a course in ethics in the one study that has investigated this (Self et al., 1995). There are several speculative reasons for

this; that the course was too short (Self et al., 1998b), suggested 'emotional hardening' in veterinary students or that the test used does not use veterinary scenarios. The 1995 Self study was carried out in the USA, and a number of other studies on veterinary students have been carried out in the USA (Self et al., 1991; Self et al., 1993b; Self et al., 1996). The results were inconclusive, but generally indicated an inhibitory effect of veterinary education on moral reasoning development. In the USA, students are college graduates when they begin their veterinary education so their scores are likely to differ from students from the UK who enter university directly from school. There is no information available on the moral reasoning ability of UK veterinary students, or their ethical development as they progress through the undergraduate curriculum. There is therefore a need to characterise moral reasoning ability in UK veterinary students both when they enter veterinary school and throughout the curriculum.

As a starting point, it was of interest to investigate the impact of the current veterinary curriculum at the University of Glasgow on students' ethical development, and in particular to assess students' moral reasoning abilities. At the University of Glasgow, formal ethics teaching in the pre-clinical years currently consists of two hours of lectures that introduce animal ethics concepts such as sentience, intrinsic value and ethical frameworks as well as specific veterinary ethics concepts such as quality and quantity of life and the ethical limits of treatment. In fourth year, teaching consists of a whole class, interactive 'workshop' session focusing on euthanasia and a small group tutorial where students discuss three case-studies that have an ethical dimension. Students review the cases before the tutorial and then during the session, with guidance from a facilitator, they discuss what they would do in each situation and why. The facilitator will often challenge their views to encourage further discourse. In fifth year, students attend a further small group tutorial which centres around two challenging 'ethical dilemma' case-studies, and students must make and defend a decision. This tutorial focuses on encouraging students to discuss the issues with peers and to generate plausible arguments for each possible course of action, including those they do not agree with. Group discussions of case studies have been found to be very effective in improving moral reasoning ability (Self et al., 1989; Self et al., 1993a; Hartwell, 1995; Latif, 2000; Smith et al., 2004) so it would be expected that following their clinical ethics teaching students' moral reasoning abilities would improve. As well as the impact of formal ethics teaching, there may also be impacts on ethical development from other sources such as the hidden curriculum (Hafferty & Franks, 1994) and students' experiences on extra mural study (EMS). Introducing ethics interventions early on in the course could also have benefits (Hebert et al., 1992; Goldie et al., 2002).

Before doing so, or establishing whether any specific components of the curriculum impact ethical development, a suitable measure must be identified with which to measure moral reasoning ability.

2.2   Choosing a suitable moral reasoning measure

To examine the impact of the veterinary curricula and specific educational interventions on moral reasoning development, a suitable standardised measure had to be identified. Unfortunately there is no currently available ethical reasoning test that uses veterinary scenarios or that uses ethical dilemmas involving animals (Wiseman-Orr et al., 2009). However, there are many standardised ethical reasoning tests available. These tests generally use hypothetical ethical dilemmas that focus on social issues. To find a suitable test, an extensive review of the literature was carried out. Six tests were considered for use. The ideal test would assess the students' ability to reason and make moral judgements, to reflect on their own standpoint, to understand and respect different viewpoints and to apply ethical principles to their own conduct. The six tests were compared for their ability to assess these criteria (Table 2.1). Other decisive factors were whether the test was easily administrable to a large number of students at one time, whether students could complete it in a short timeframe, whether it had been well-validated and whether it could be assessed without specialist training. All tests considered had good internal reliability and test-retest reliability (Rest et al., 1974; Eckensberger & Zimba, 1980; Page & Bode, 1980; Moore 1988; Basinger et al., 1995; Lind, 2005).

Can assess ability to:	Test					
	MJI	DIT	ERI	SRM-SF	MJT	LEP
Reason and make moral judgements	✓	✓	✓	✓	✓	✗
Reflect on own standpoint	✗	✗	✗	✗	✗	✓
Understand and respect different viewpoints	✗	✗	✗	✗	✗	✓
Apply ethical principles to own conduct	✗	✗	✗	✗	✗	✓
Other decisive factors:						
Easily administrable to group	✗	✓	✓	✓	✓	✓
Can be completed in short time	✗	✓ (Short form)	✗	✓	✓	✗
Can be assessed by non-expert	✗	✓	✓	✓	✓	✓
Widely validated	✓	✓	✗	✓	✓	✗

Table 2.1: Tests considered for measuring moral reasoning

MJI = Moral Judgement Interview (Kohlberg, 1958), DIT = Defining Issues Test (Rest et al., 1974), ERI = Ethical Reasoning Inventory (Page & Bode, 1980), SRM = Sociomoral Reflection Measure (and Short Form) (Gibbs et al., 1982; 1992), MJT = Moral Judgement Test (Lind, 1985), LEP = Learning Environment Preference Questionnaire (Moore, 1987)

Table 2.2 describes the format of each of the tests under consideration and summarises their strengths and weaknesses. The earliest measure of moral reasoning that was developed was the Moral Judgement Interview (MJI) (Kohlberg, 1958) and most other measures stemmed from it. The MJI is thought to be the most accurate measure of moral reasoning ability available (Self et al., 1993b). However, it can only be administered by people who have undergone specialist training, and as it involves individual, face-to-face interviews, it is time-consuming to administer and thus is not suitable for use with large groups of students. Since the creation of the MJI, several alternative tests have been developed. The most commonly used of these is the Defining Issues Test (DIT) (Rest et al., 1974). The DIT has been promoted as a simpler, less time-consuming alternative to the MJI. It is a scenario-based, multiple choice, pen and paper test. The DIT is a recognition measure, which means the respondent has to rate the supplied statements for level of importance rather than come up with their own reasoning as to what is important in making their decision. Some of the statements supplied are nonsensical, made up of complex vocabulary in an attempt to identify and eliminate respondents who choose statements based on how they sound rather than their meaning and actual importance in decision-making. This multiple-choice approach allows the DIT to be objectively scored, removing

the need for specialist assessors. It has been used in hundreds of studies (King & Mayhew, 2002) and has been described as "the most reliable and valid of all moral reasoning instruments" (Latif & Dunn, 2004).

Test	Type and format of measure	Strengths	Weaknesses
MJI	Production measure that involves a 45 minute semi-structured interview with a trained assessor Respondent is presented orally with 6 fictional ethical dilemmas and follow up open-ended questions to elicit different levels of reasoning Generates score for stage of moral reasoning (1-5/6)	Well-validated Measures Kohlbergian stages of moral development Takes into account individual answers and alters questioning accordingly	Cannot be administered to large groups Requires expensive, specialist training to rate responses No known support available Time-consuming
DIT	Pen and paper or online, recognition measure Presents series of ethical dilemmas (in form of stories). Respondent has to decide which action they would take then rate 12 accompanying reasoned statements for level of importance and rank 4 statements as most important in their decision-making. Comes in 3 forms: original 6-story DIT-1, short-form 3-story DIT-1 or newest 5-story DIT-2 Focuses on respondent's preference for post-conventional reasoning but provides scores for lower stages and stage preference	Can be administered to large numbers Support available Shortened version available which is less time consuming Automatic scoring available Well validated, used in many undergraduate studies including studies on veterinary students Measures stage preference and focuses on post-conventional moral reasoning	Expensive to buy and score Full version which is most reliable takes 40-45 minutes to complete Sensitivity may be problematic as students may not reach level of post-conventional reasoning
ERI	Pen and paper, recognition measure Multiple-choice with 26 questions on 6 dilemmas Uses Kohlberg's open ended questions in branching technique to evaluate average stage selection	Can be administered to large numbers Inexpensive Objectively scored Measures Kohlbergian stages, and mirrors technique of original measure, the MJI	No support available Takes approximately 45 minutes to complete Few studies have used it

Test	Type and format of measure	Strengths	Weaknesses
SRM -SF	Pen and paper, production measure Consists of 11 items that address several sociomoral values. Questions in 5 sections: Truth and Contract, Affiliation, Life, Property and Law, and Legal Justice Each item contains a two-part question and respondents are asked to evaluate and justify the importance of each value Justifications given are then scored for preferred stage of Kohlbergian moral reasoning (Stages 1-4)	Can be administered to large numbers Inexpensive Quick to complete (15-20 minutes) Scoring can be self-taught Well-validated measure Similar to MJI in that requires respondents to spontaneously justify their choices	Support not available Time consuming to score Primarily designed for children and low-literacy subjects so may be too simplistic Does not assess post-conventional level moral reasoning
MJT	Pen and paper, recognition measure Consists of 2 ethical dilemmas accompanied by 6 pro and 6 con arguments relating to the protagonist's action in the dilemma. Respondent asked to rate whether they agree or disagree with action (scale -3 to +3), then to rate the 12 statements on their level of acceptability (scale -4 to +4) Measures stage consistency	Easy to administer to large groups No cost Support available from author Short completion time Easy to mark Used in several studies	Measures consistency rather than Kohlbergian stage preference Not been used as extensively as DIT
LEP	Pen and paper, recognition measure Presents 5 domains each with 13 statements to be ranked on scale of 1 to 4 ('not at all significant' to 'very significant') when considering a learning environment Then top 3 statements are ranked on each domain Main scores gives the position preference on Perry's scheme	Can be administered to large numbers Low cost Support available Scoring available Reasonably well validated Measures three important criteria not evaluated by other tests	'Ethical' meant in classical sense Does not measure moral reasoning levels Measure focuses on the intellectual part of the scheme rather than the 'ethical' part Takes up to 45 minutes to complete

Table 2.2: Characteristics of six moral development tests and a summary of their strengths and weaknesses

The Ethical Reasoning Inventory (ERI) (Page & Bode, 1980) uses the same probe questions as the MJI but is a paper-based approach. It was designed to provide a moral reasoning measure similar to the MJI but that is objectively scored and can be group administered. Another measure of moral reasoning derived from the MJI is the Sociomoral Reflection Measure (SRM) (Gibbs et al., 1982). Unlike the DIT and the ERI, it is a production measure where respondents are expected to spontaneously produce reasons for their choices rather than choose pre-populated answers. The creation of the SRM aimed to reduce the intensity of training required for scorers in comparison to the MJI while retaining most of its important features. A shortened version of the SRM, the Sociomoral Reflection Measure-Short Form (SRM-SF), is also available (Gibbs et al., 1992) and was the version considered here. The SRM-SF (unlike the other measures reviewed) does not include dilemmas; instead it uses a series of questions on social values that Kohlberg considered "the core of morality" (Gibbs et al., 2007).

One of the most recently developed moral reasoning measures is the Moral Judgement Test (MJT) (Lind, 1985). Rather than measuring stage preference as the DIT does, the primary score on the MJT represents how consistently an individual follows a moral principle, even when faced with positions they do not agree with (Ishida, 2006). This consistent position may be at levels lower than post-conventional reasoning.

The Learning Environment Preferences (LEP) questionnaire (Moore, 1987) is an objective measure of Perry's Scheme of Intellectual and Ethical Development (1970). Perry's scheme comprises nine levels (Table 2.3) which do not directly relate to the Kohlbergian stages described earlier. The LEP measures the respondent's position on the first five stages of the Perry scheme (Moore, 2002) and uses five domains relating to learning environments to investigate how a respondent likes to learn and this is correlated with their position in Perry's scheme.

Position	Description
Position 9	Own identity established and lifestyle reflects personal commitments
Position 8	Implications of commitments made are recognised
Position 7	Establishment of identity begins through a commitment in some area.
Position 6	Values emerge. Limitations to intellectual development are realised and life commitments to a particular pathway are foreseen but not yet acted upon. At this stage (and beyond), ethical behaviour is driven by informed choices based on individual values and considerations of right and wrong.
Position 5	Dualistic thinking no longer predominates. Solutions and values that drive those solutions are dependent on the situation. Within this there are better/worse answers. Students learning to evaluate solutions. Level we want college students to achieve.
Position 4	Here students may believe that most problems have no known solution and so everyone has right to their own opinion, or that problems are unsolvable so doesn't matter which solution you choose.
Position 3	Aware there are questions that we know answers to and that there are questions we don't know answers to yet. Believes there are right/wrong ways to find answers to things that are not known yet.
Position 2	Aware of others believing in uncertainty but believes there are correct solutions, and that their thinking is right and others is wrong.
Position 1	World perceived in terms of right vs. wrong. All problems are solvable. Being good equated with doing 'right' behaviour a lot.

Table 2.3: The nine positions in Perry's (1970) Scheme of Intellectual and Ethical Development

The pros and cons of each of the tests were considered (Table 2.2). Initially, it appeared that the LEP addressed most of the required elements, but it did not give information on making moral judgements, which was considered of major importance. It also transpired that the LEP focuses on the first five stages of Perry's scheme which centre on intellectual development, while it is the last four stages that centre on ethical development (Moore, 2002). Moreover, after consultation with the author (Moore, personal communication), it became apparent that the use of the term 'ethical development' by Perry did not refer to ethical awareness or moral judgement but to a classical sense of good character, and that the test itself measures epistemological development[6] rather than ethical development. As a result, this test was eliminated from further consideration. The two tests that met the

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[6] Epistemology is a branch of philosophy that investigates the origin, nature, methods and limits of human knowledge.

majority of the relevant criteria were the DIT and the SRM-SF. Other tests were rejected for various reasons (Table 2.2), for example, because the MJI cannot be administered to groups, the ERI takes too long for respondents to complete and the MJT does not provide a score for preferred moral reasoning stage. The short forms of both the DIT and the SRM provided an easily administrable, well-validated option for testing. It was hypothesised that first year students may not attain the level of post-conventional reasoning that the DIT targets so the SRM-SF was thought to supplement this by providing a measure at lower levels of moral reasoning.

2.2.1   Aims

Using the selected moral reasoning tests, the DIT-1 short form (three-story) and the SRM-SF, a preliminary study was carried out to establish the suitability of these tests for measuring moral reasoning abilities in first year veterinary students (Experiment 1). The full cohort of first year veterinary undergraduates (2009-2010) at the University of Glasgow were asked to complete one of the two tests before and after their first pre-clinical extra mural study (PC-EMS) placement. In Experiment 2, first year veterinary students (2010-2011) at the University of Glasgow were asked to complete the DIT-2 before and after completing a novel, reflective exercise that aimed to promote ethical development. The aims of Experiment 2 were a) to establish the moral reasoning ability of UK veterinary students on entering the first year of veterinary school and b) to assess whether completing a novel, reflective ethics exercise would impact students' moral reasoning scores (the results of Experiment 2b are discussed in Chapter 4). The aim of Experiment 3 was to investigate, through a cross-sectional design, whether moral reasoning ability in veterinary students at different stages of the course was impacted by the current Glasgow University curriculum. Data was collected from fourth year students in session 2010-2011 and the same cohort of students were invited to re-take the DIT after their formal clinical ethics teaching in fifth year.

2.3   Methodology

2.3.1   Test allocation and administration

2.3.1.1 Experiment 1

Ethical approval for collecting data from students was obtained from the University of Glasgow's Faculty of Veterinary Medicine Ethics and Welfare Committee. In the first year of the study, 116 first year veterinary students (2009-2010) at the University of Glasgow participated from a cohort of 129 students. These students will be referred to as cohort 1. Cohort 1 was split into two equal-sized groups; one group was allocated the three-story DIT-1 (Appendix A1) and the SRM-SF (Appendix A2) was allocated to the other. Students were allocated randomly but the groups were adjusted for gender.

Students first completed the three-story DIT-1 or the SRM-SF after a clinical skills class in February 2010, before completion of a PC-EMS placement. These tests will be referred to as the 'pre-EMS DIT' and the pre-SRM-SF respectively. The students were given written instructions on how to complete the test along with a statement indicating that completion implied consent. They were allowed 30 minutes to complete the test. Additional information was collected from each student on gender, age, nationality, upbringing[7] and whether they already held a degree[8]. Students were asked to complete the same test nine weeks later (after most had completed a PC-EMS placement). These tests will be referred to as the 'post-EMS DIT' and the post-SRM-SF. The re-tests were administered after an unrelated lecture. At the time of re-test, students were asked whether they had completed a PC-EMS placement since the last test and with which species. All testing was carried out in the morning.

2.3.1.2 Experiment 2

Following the pilot of the two short-form moral reasoning tests, the decision was taken in the second year of the study to use the longer, five-story DIT-2 (Appendix A3). There is

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[7] Whether they were raised in an urban area, a rural area or on a farm.
[8] It is common for students who study veterinary medicine to do this as a second degree, especially North American students.

evidence that the more dilemmas considered by students, the more reliable the results of the test are (Rest, 1993), and in the second year, more time with the students was available. The students sitting this test were 109 first year veterinary students in academic session 2010–2011 and will be referred to as cohort 2. Students were asked to complete the DIT-2 at the beginning of a computer-based teaching session on animal ethics in February 2011. This test will be referred to as cohort 2's pre-DIT. This teaching session introduced the novel, reflective exercise piloted by the volunteers in cohort 1 and all students in cohort 2 were asked to complete it. Students re-sat the DIT-2 in the first week of their second year (in September 2011) after most students had completed a PC-EMS placement and subsequently the novel, reflective exercise. This test will be referred to in the remainder of this chapter as the post-DIT. The results of the impact of the novel, reflective exercise on DIT scores are discussed in Chapter 4.

2.3.1.3 Experiment 3

To assess moral reasoning development in successive years of the veterinary programme, a group of 54 fourth year veterinary students (2010-2011) were asked to complete the DIT-2 at the beginning of an ethics teaching session (February 2011). Fourth year is the first year of clinical study in UK veterinary schools. These students will be referred to as cohort 3. Students from this year group were asked to complete the DIT-2 a second time in their fifth (and final) year after they had completed all their formal ethics teaching. Students were individually emailed immediately following their final ethics tutorial with a link to an online version of the DIT-2. Students were offered £5 worth of print credits as an incentive to encourage participation. The online DIT-2 stated that completion of the test indicated the student's consent for the data to be used for research purposes.

2.3.2   Data handling

2.3.2.1 DIT scoring

After each testing session, completed DITs were checked to ensure identification numbers were clearly marked and then they were posted to the Center for the Study of Ethical Development at the University of Alabama where they were scored using Scantron Opscan software (Scantron Corporation, USA). Results are returned electronically and a summary

of the results is provided as well as raw data files. Preliminary indications of which responses should be purged are indicated. Responses can be purged due to incomplete test protocols but also because the results are likely to be unreliable due to a number of factors (see Table 2.4). The guide that accompanies the DIT-1 gives more detailed information regarding purging unreliable results (Rest, 1993). The guide stipulates that "it is usual in studies to lose between 5 and 15% of the sample" as a result of these checks. The guidelines are based on the six-story DIT-1 and the purge guidelines are less clear for the three-story DIT-1. The suggestion is that the cut-offs should be around half of those for the six-story DIT-1. Using the guidelines provided, further purges were done on the results (Table 2.4). Utilizer scores of 9.99 (i.e. unable to be computed) were not purged because they are caused by indecision on the respondent's part, i.e. 9.99 is the result of the respondent selecting 'can't decide' on all five stories. As this is a valid answer it was not appropriate to purge these respondents.

Reliability check	3-story DIT-1	5-story DIT-2
Rate-and-rank consistency	> 150	>= 200
Meaningless	>= 4	> 10
MISRANK	> 3	>= 6
MISSRA	> 0	>= 3
NODIFF	> 0	>= 2
Utilizer	Not purged even if 9.99	Not purged even if 9.99

Table 2.4: Reliability checks and their purge criteria for the Defining Issues Test

Based on information from Rest (1993) and Bebeau & Thoma (2003). This table lists the measures that are considered before a response is purged due to unreliability. An explanation of the measures is given below:

Rate-and-rank consistency = this checks whether respondents are being consistent in their rating e.g. if they rank an item as most important in making their decision it would not be expected that it would be rated as 'of little importance'. If there is too much inconsistency in responses, it may indicate that the subject is responding randomly. It also checks whether respondents are marking each item with the same rating.

Meaningless = this check relates to items written as an internal reliability check. There are items within the DIT that are written in a pretentious manner in order to sound like they are important but are really meaningless. This check identifies respondents that rank these items of high importance in their decision making.

Completing the DIT requires the respondent to first **rate** the 12 statements on level of importance and then **rank** four of the items as the four most important. The MISSRA and MISRANK variables indicate missing data. Some missing data can be tolerated. The **MISSRA** variable indicates whether respondents have ranked at item that they failed to rate and the **MISRANK** variable counts how many rankings are left blank.

NODIFF = identifies non-differentiation of rates or ranks e.g. if respondents give all items of a story the same rating, or ranks the same item as most important, second most important and so on. Non-differentiation in one story is tolerated if using the DIT-2 or the six-story DIT-1.

Utilizer = measure whether the ranking on each dilemma is consistent with the action chosen and are given as a correlation (+1 to -1) with negative values indicating lack of consistency and positive values indicating consistency.

The DIT results include individual scores for percentages of reasoning at three different levels referred to as moral schema (cognitive structures of moral reasoning) – personal interests (Stage 2/3), maintaining norms (Stage 4) and post-conventional (Stage 5 or above) (Rest et al., 2000). The P score indicates the percentage of the respondent's answers that use post-conventional moral reasoning and the N2 score measures the degree to which post-conventional moral reasoning is prioritised but also the degree to which lower level moral reasoning is rejected (Bebeau & Thoma, 2003). The P score is the original measure and is cited most extensively in the literature whereas the N2 score is newer but is said to be a more reliable construct (Rest et al., 1999). Additional scores of interest are profile indicators and Type indicators. The profile indicator denotes whether the respondent has a consolidated profile or a transitional profile. A consolidated profile shows that the respondent is consistent in their reasoning whereas a transitional profile indicates disparity in their answering. The Type indicator, measured on a scale of one to seven, gives the predominant level of reasoning in the respondent's answers as well as taking into account whether the profile is consolidated or transitional (Table 2.5). Type indicators can also be merged into three moral reasoning levels: pre-conventional (1 and 2), conventional (3, 4 and 5) and post-conventional (6 and 7) (Bebeau & Thoma, 2003).

Type	Profile indicator	Predominant schema of moral reasoning	Level of moral reasoning
1	Consolidated	Personal Interests	Pre-conventional
2	Transitional	Personal Interests	Pre-conventional
3	Transitional	Maintaining Norms	Conventional
4	Consolidated	Maintaining Norms	Conventional
5	Transitional	Maintaining Norms	Conventional
6	Transitional	Post-conventional	Post-conventional
7	Consolidated	Post-conventional	Post-conventional

Table 2.5: Categorisation of Type indicators

An additional score provided by the DIT-2 is the number of 'can't decides'. In each scenario, the respondent is asked whether they would do something, not do something or 'can't decide'. The number of 'can't decides' selected is considered to be a measure of

indecision. The minimum score for this measure is zero and the maximum is five. The DIT-2 also directly records demographic information including gender, age, educational level and whether the respondent is a US citizen or not.

2.3.2.2 SRM–SF scoring

Marking the SRM-SF required thorough examination of the material in the scoring manual (Gibbs et al., 1992) and completion of the practice scoring exercises it included. The primary score in the SRM-SF is the Sociomoral Reflection Maturity Score (SRMS). Consistently attaining SRMS scores within 0.2 or less of the given score indicates a satisfactory level of competency, which was achieved before embarking on scoring of students' tests. The SRM-SFs were scored blind. The response to each question was given a mark on a scale of one to four or marked as unscorable. The marks equate to Kohlberg's stages of moral reasoning (ratings 1 and 2 are pre-conventional and ratings 3 and 4 are conventional). The mean of the total marks on all scorable responses was calculated to produce the SRMS. There are a total of 11 questions and each questionnaire has to have at least seven scorable responses otherwise it is deemed unscorable. Using the mean of the ratings, the respondent was allocated a Global Stage (GS). The GS indicates the moral stage preference of the respondent (based on Kohlbergian stages (see Table 1.3)), subdivided into ten levels (rather than four stages) to show transitional stages (Table 2.6). An example of a scored test protocol is provided in Appendix A4.

Score	Global Stage
1.00 -1.25	Stage 1
1.26 – 1.49	Transition 1(2)
1.50 – 1.74	Transition 2(1)
1.75 – 2.25	Stage 2
2.26 – 2.49	Transition 2(3)
2.50 – 2.74	Transition 3(2)
2.75 – 3.25	Stage 3
3.26 – 3.49	Transition 3(4)
3.50 – 3.74	Transition 4(3)
3.75 – 4.00	Stage 4

Table 2.6: Global Stages in the Sociomoral Reflection Measure – Short Form

Stages are based on Kohlberg's stages of pre-conventional and conventional moral reasoning but have intermediate stages as well which indicate that the respondent is in transition from one stage to another. Bracketed numbers indicate the transitional stage e.g. respondent scoring 3(2) is predominantly stage 3 but has some stage 2 responses.

A Type B score was also allocated to each respondent and refers to moral type, scored on three classifications: balancing, conscience and fundamental valuing. If the respondent had one response matching any of these classifications, the respondent was assigned a score of one for that category (scale 0-3). A respondent was considered to be Type B if they had a total score of 2 or 3. Type B reasoners are thought to be more suited to post-conventional reasoning than Type A (Kohlberg, 1984, p535). Type A reasoners make moral judgements more predictably, based on rules and authority whereas Type B reasoners are more intuitive in recognising moral values (Gibbs et al., 1992).

2.3.3   Statistical analysis

All statistical analyses, except for chi-square tests, were carried out using Minitab 16 Statistical Software (Minitab Inc., USA). Before examining the effects of various factors on the DIT scores, tests for normality (Anderson-Darling) and equal variances (Levene's test) were carried out on the P and N2 scores. To give an indication of change in score from test to test, P and N2 scores from pre-DITs were subtracted from those of post-DITs to create new variables called 'change in P score' and 'change in N2 score'. All scores (P

and N2 pre and post scores and 'change in N2 score') except 'change in P score' in cohort 1 met normality assumptions and were analysed using general linear models (GLMs). Kruskal-Wallis tests were used to analyse 'change in P score'. Paired t-tests were used to compare pre and post-DIT scores in the same cohort. Two-sample t-tests were used to investigate differences in P and N2 scores between cohorts.

Several of the demographic factors collected were merged into fewer categories to provide groups for statistical analysis. Nationalities were merged into British/Irish, North American (American & Canadian) and all others were categorised as Rest of the World. As there was a wide age range, first year respondents were classified into four groups, 18 year olds, 19 year olds, 20 to 22 year olds and 23 and over. These age groups are likely to represent different levels of experience both within academic education and otherwise and provided groups large enough for meaningful statistical comparisons. For fourth years, these same age groups were advanced three years (21, 22, 23 to 25 and 26 and over) to reflect age progression. Although both nationality and 'degree held' were collected it became apparent that nationality was confounded with 'degree held' in cohort 1 (only North American students held degrees) so an assumption was made that 'degree held' was the causal variable. These variables were not confounded in cohorts 2 and 3. Each demographic factor collected was initially tested separately using GLMs (gender, 'degree held', upbringing, age group, nationality, and whether student's first language was English). If the resultant p value was less than 0.2 it was combined in a subsequent GLM with any other factors that also had p values of less than 0.2. For comparisons of UK veterinary students with students of other professions, one-sample t-tests were used to calculate 95% confidence intervals. Chi-square tests were used to test whether the proportions of students assigned to each moral reasoning level differed between cohorts and between pre and post-DITs. SPSS (IBM, USA) was used to carry out these tests.

Similar tests for normality and equal variance were carried out on the SRM-SF scores and the normality assumptions were met. A mixture of two-sample t-tests and GLMs were used to investigate the impact of each demographic factor collected (gender, 'degree held', upbringing, age group and nationality) both on the pre-SRM-SF and the post-SRM-SF. Paired t-tests were used to test the effect of PC-EMS on SRM-SF scores.

2.4   Results

2.4.1   Experiment 1

2.4.1.1 DIT - Demographic information

In cohort 1, 51 students completed the pre-EMS DIT (40% of the class and 77% of the group allocated the DIT) and 48 completed the post-EMS DIT (37% of the class and 73% of the group allocated the DIT). After purging, 40 pre-EMS DITs remained (22% purged) and 38 post-EMS DITs (21% purged). Thirty-eight students completed both the pre and post-EMS DITs and after purging, 27 of these (21% of the class and 41% of the group allocated the DIT) were included in the final data set (29% purged). The most common reason for purging was a high selection of meaningless items. Demographic information on students who produced usable test protocols is displayed in Table 2.7. In each test (pre-EMS and post-EMS), at least 80% of cohort 1 respondents were female and over 30% of respondents had already completed a degree. A small number of males (n = 4) successfully completed both tests. Similarly, the number of students from outwith Britain and Ireland, and North America was minimal. The age range was 18-28 years. Information on area of upbringing revealed that in each sample, the largest proportion were of urban upbringing (62% on pre-EMS DIT and 47% on post-EMS DIT), between 30 and 35% had a rural upbringing and a small number were brought up on a farm. Only students whose first language was English successfully completed the post-EMS DIT. Of those students in cohort 1 that completed both the pre-EMS and post-EMS DITs, 24 of them completed a PC-EMS placement in between tests (19% of the class and 36% of the group allocated the DIT).

Demographic characteristic	Pre-EMS DIT	Post-EMS DIT	Pre-EMS + post-EMS DIT
Gender			
F	0.80	0.84	0.85
M	0.20	0.16	0.15
Age			
18	27.5	0.29	0.33
19	0.20	0.16	0.18
20 – 22	0.25	0.16	0.18
23 and over	0.28	0.24	0.30
Unknown	0	0.16	0
Nationality			
North American	37.5	0.32	0.37
British + Irish	0.55	0.50	0.63
Rest of World	0.05	0	0
Unknown	0.02	0.18	0
Upbringing			
Farm	0.05	0.05	0.04
Rural	0.32	0.32	0.33
Urban	0.62	0.47	0.63
Unknown	0	0.16	0
Degree held			
No	0.60	0.53	0.63
Yes	0.40	0.32	0.37
Unknown	0	0.16	0
First language English			
No	0.05	0	0
Yes	0.92	0.82	27
Unknown	0.02	0.18	0

Table 2.7: Proportion of first year veterinary students that completed the 3-story DIT before and after EMS by gender, age, nationality, upbringing, educational level and native language Missing data (unknowns) are caused by incomplete responses by students.

2.4.1.2 DIT - P and N2 scores

The means (and standard errors) for the different moral schema identified by the DIT are shown for cohort 1 (first year pilot study) for the pre-EMS and post-EMS DITs in Figure 2.1. The mean P score (percentage of the respondent's answers that use post-conventional moral reasoning) for this cohort was 38.7 ($\pm$ 2.8) on the pre-EMS DIT and was 39.5 ($\pm$ 2.9) on post-EMS-DIT and the mean N2 score (degree to which post-conventional moral reasoning is prioritised but also the degree to which lower level moral reasoning is rejected) on the pre-EMS DIT was 36.0 ($\pm$ 2.5) and on the post-EMS DIT was 39.4 ($\pm$ 2.3).

There were a wide range of scores for post-conventional reasoning, with levels measured by P score ranging from 0 to 80, resulting in large standard deviations. Cohort 1's pre-EMS DIT P and N2 scores were not affected by gender, age group, 'degree held' or upbringing. The farm group was so small (n = 2) that only urban and rural were statistically analysed for upbringing. Similarly, the effect of first language could not be tested statistically because there were only two non-native English speakers.
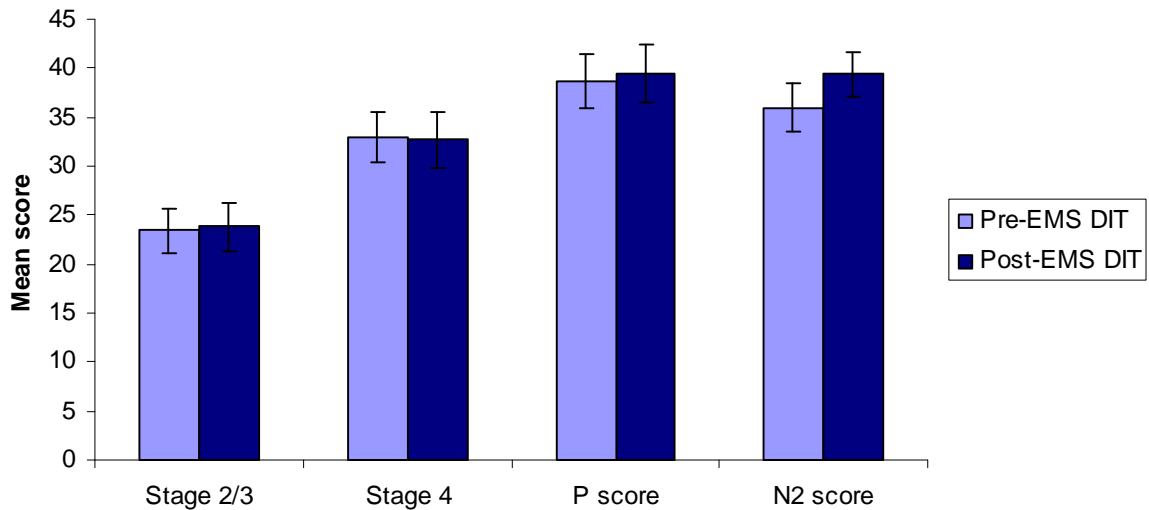
Figure 2.1: Mean DIT scores (+/- standard errors) for cohort 1 on the pre-EMS DIT and post-EMS DIT

Pre-EMS DIT n = 40, Post-EMS DIT n = 38

Cohort 1's post-EMS DIT P and N2 scores were not affected by gender, age group or upbringing. The P and N2 scores differed depending on whether the student had a degree or not (P score, p = 0.041; N2 score, p = 0.038) with those holding a degree on average scoring 12 to 13 points more than those without.

'Change in P' and 'change in N2' scores were both influenced by age group (P score, p = 0.006; N2 score, p = 0.024) and whether the student was a degree holder or not (P score, p = 0.003; N2 score, p = 0.001). The only positive change was seen in the oldest age group (23 and over, median change + 20), with all other age groups showing decreases. Degree holders showed an increase in P and N2 scores between tests (median change = +17.7), with non-degree holders having a downward change between tests (median change = -10).

No difference was found between the pre-EMS and post-EMS DIT P and N2 scores for cohort 1 as a whole (paired t-tests, n = 27). When testing the students who completed a PC-EMS placement, no difference was found between their pre and post P or N2 scores (paired t-tests, n = 16).

2.4.1.3   DIT - Type indicators

In this first cohort of first year students, on both the pre and post-EMS DITs, the highest proportion of respondents were allocated Type 7 (Figure 2.2a and b). Type indicators give the predominant level of Kohlbergian reasoning (refer to Table 2.4). Fifty-five percent of students had a transitional profile on the pre-EMS DIT and 45% had a consolidated profile. On the post-EMS DIT, 63% of students had a consolidated profile while 37% were transitional types. On both the pre and post-DIT, the largest proportion of students in cohort 1 relied on post-conventional moral reasoning (42% and 49% respectively), with the next largest proportion relying on conventional level reasoning (40% and 29%) and the smallest proportion relying on pre-conventional moral reasoning (18% and 21%). From pre-EMS to post-EMS test there are no significant differences in the proportion of students assigned to each level (chi-square test).
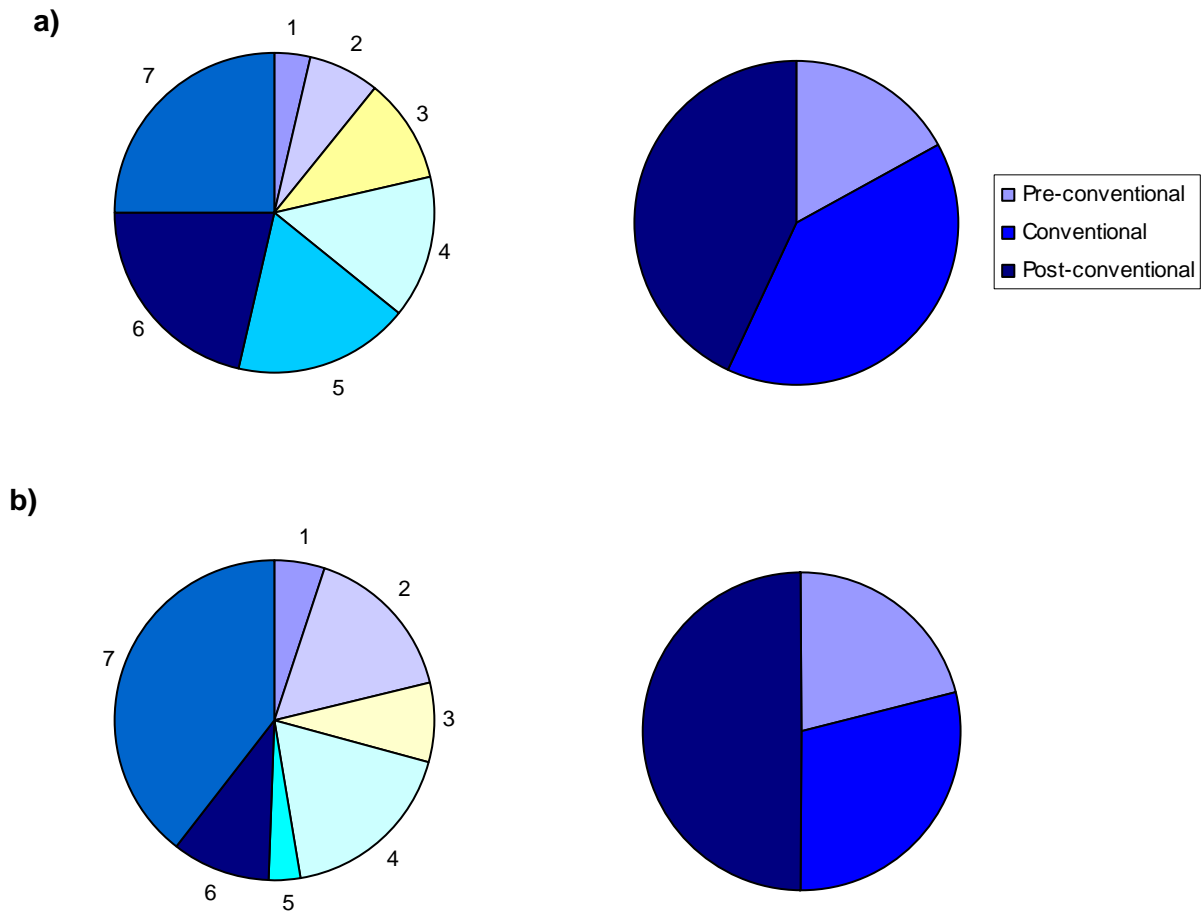
Figure 2.2: Proportion of students in cohort 1 assigned to each Type (1-7) and each level of moral reasoning on a) the pre-EMS DIT and b) the post-EMS DIT

2.4.1.4 SRM-SF – Demographic information

The pre-SRM-SF was completed by 54 students and the post-SRM-SF was completed by 53 students but six of the post-SRM-SFs were unscorable, resulting in 47 scored post-SRM-SFs. Forty students had scorable protocols for both the pre and post-SRM-SF. Demographic information on students who produced scorable test protocols are given in Table 2.8.

Demographic characteristic	Pre-SRM-SF	Post-SRM-SF	Pre + post-SRM-SF
Gender			
F	0.78	0.72	0.80
M	0.22	0.28	0.20
Age			
18	0.35	0.28	0.30
19	0.22	0.21	0.25
20 – 22	0.17	0.23	0.20
23 and over	0.26	0.21	0.25
Unknown	0.00	0.06	0.00
Nationality			
North American	0.31	0.28	0.32
British + Irish	0.54	0.51	0.52
Rest of World	0.15	0.15	0.15
Unknown	0.00	0.06	0.00
Upbringing			
Farm	0.11	0.11	0.10
Rural	0.43	0.45	0.48
Urban	0.46	0.38	0.42
Unknown	0.00	0.06	0.00
Degree held			
No	0.68	0.66	0.68
Yes	0.31	0.28	0.32
Unknown	0.00	0.06	0.00
EMS placement completed			
No	N/A	0.08	0.08
Yes	N/A	0.91	0.92

Table 2.8: Proportion of first year veterinary students that completed the SRM-SF before and after EMS by gender, age, nationality, upbringing and educational level

2.4.1.5   SRM-SF - Scores

In both the pre and post-SRM-SFs, the average number of scorable responses was between 9 and 10 (out of a possible 11). All protocols on the pre-SRM-SF were scorable whereas 11% were unscorable on the post-SRM-SF. The average score on the pre-SRM-SF and post-SRM-SF tests were 3.15 and 3.13 respectively. The predominant GS was 3 on both the pre and post-SRM-SFs (Table 2.9). In the pre-SRM-SF, 1.8% were assigned GS 4 whereas in the post-test no students attained GS 4. In the pre-SRM-SF, 47% exhibited Type B moral reasoning compared to 30% in the post-SRM-SF. None of the demographic

factors collected had an effect on SRM-SF scores. There was no impact on SRM-SF scores as a result of completing a PC-EMS placement (paired t-test, n = 23).

Global Stage	Pre-SRM-SF (%)	Post-SRM-SF (%)
2(3)	0.0	1.9
3(2)	1.8	5.7
3	70.9	50.9
3(4)	21.8	22.6
4(3)	3.6	7.6
4	1.8	0.0
Unscorable	0.0	11.3

Table 2.9: Percentage of students assigned to each Global Stage on the Sociomoral Reflection Measure-Short Form (SRM-SF)

2.4.2 Experiment 2

2.4.2.1 Demographic information

One hundred and nine students in cohort 2 completed the pre-DIT and after unreliable results were purged, 103 remained (5% purged). Although 122 students completed the post-DIT, six respondents were repeating the year so were removed and 17 were purged due to unreliability (20%), leaving 99. Both pre and post-DITs were completed by 92 students, 14 were purged (15%), leaving 78. Again, the most common reason for purging was selection of meaningless items as highly important. Table 2.10 displays demographic information for cohort 2. The demographic of cohort 2 was similar to that of cohort 1. It was 76% female with 37% of those that sat both pre and post-DITs already holding a degree. Students' ages ranged from 18 to 37.

Demographic characteristic	Pre-DIT-2	Post-DIT-2	Pre + post-DIT-2
Gender			
F	0.76	0.82	0.81
M	0.24	0.18	0.19
Age			
18	0.39	0.30	0.38
19	0.14	0.20	0.17
20-22	0.21	0.17	0.17
23 and over	0.25	0.27	0.27
Unknown	0	0.05	0.01
Nationality			
North American	0.30	0.30	0.33
British + Irish	0.60	0.56	0.60
Rest of World	0.09	0.09	0.06
Unknown	0.01	0.05	0
Upbringing			
Farm	0.13	0.11	0.13
Rural	0.33	0.34	0.35
Urban	0.50	0.45	0.51
Unknown	0.04	0.09	0.01
Degree held			
No	0.63	0.59	0.60
Yes	0.37	0.37	0.40
Unknown	0	0.04	0
First language English			
Yes	0.93	0.95	0.96
No	0.07	0.05	0.04

Table 2.10: Proportion of first year veterinary students from cohort 2 that completed the DIT-2 by gender, age, nationality, upbringing, educational level and native language

2.4.2.2 P and N2 scores

The results of the pre-DIT for cohort 2 are shown in Figure 2.3. The mean P score was 39.6 ($\pm$ 1.3) and the mean N score was 38.1 ($\pm$ 1.2). These mean scores were similar to those of cohort 1. As with cohort 1, this cohort of first year students also showed a wide range of ability with N2 scores ranging from 8.9 to 63.4.
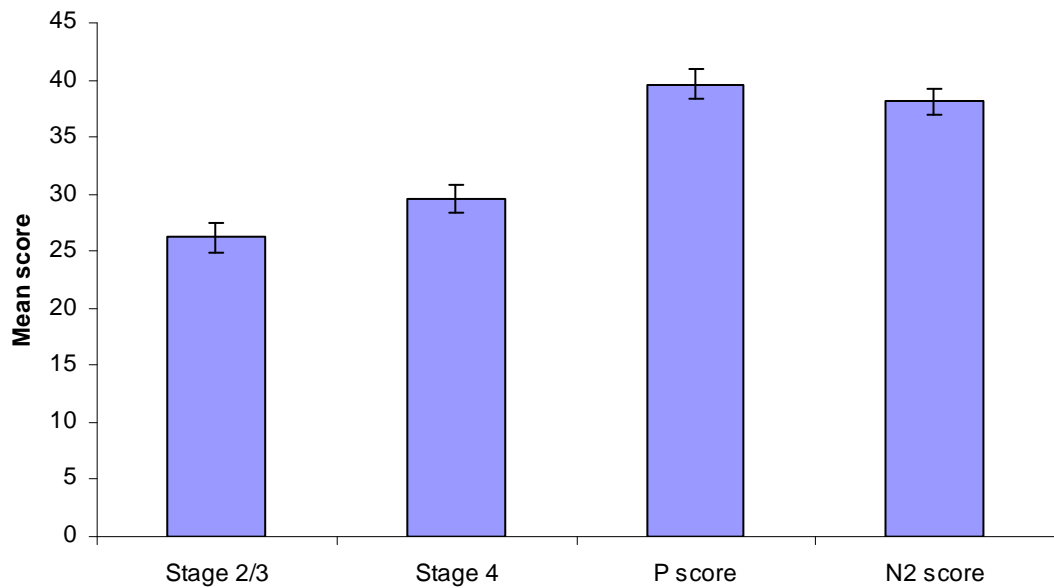
Figure 2.3: Mean DIT scores (+/- standard error) for cohort 2 on the pre-DIT

The pre-DIT P and N2 scores in cohort 2 were not affected by gender, age group, upbringing or whether the student's first language was English. Non-degree holders had a lower N2 score than those that already held a degree (p=0.049). The difference in mean N2 scores of males and females approached significance (p = 0.077) with females having a mean score of 39.4 and males 34.1 but both had large standard deviations. Sixty-nine percent of students in cohort 2 made a choice on all the scenarios in the pre-DIT (no 'can't decides').

2.4.2.3 Type indicators

In cohort 2, the highest proportion of respondents were allocated Type 7 on the pre-DIT similar to cohort 1 (Figure 2.4). An identical result to cohort 1 was also found for profile indicators with 55% having a transitional profile and 45% having a consolidated one. As in cohort 1, the majority of cohort 2 relied on post-conventional moral reasoning with conventional and pre-conventional making up similar proportions of the remainder (Figure 2.4).
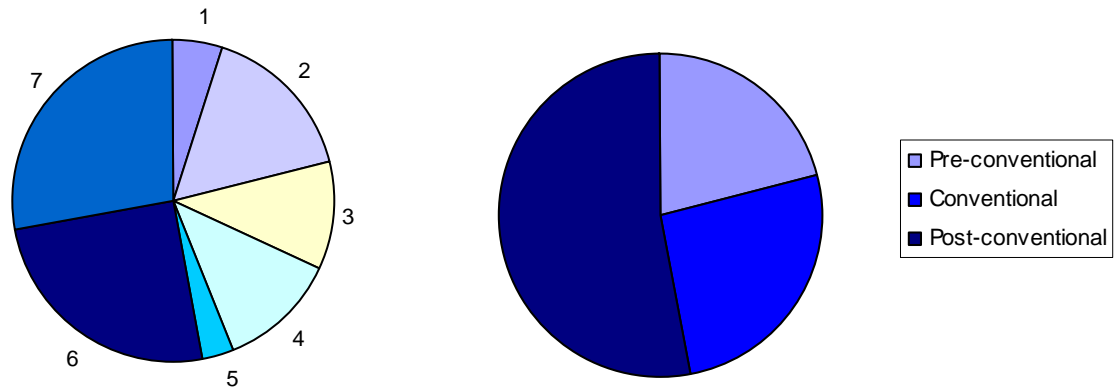
Figure 2.4: Proportion of students in cohort 2 assigned to each Type Indicator and each level of moral reasoning

2.4.3   Experiment 3

2.4.3.1   Demographic information

In cohort 3, 54 fourth year students completed the DIT-2. After unreliable results were purged, the number of tests remaining was 50 (7% purged). Table 2.11 contains demographic information for the students in cohort 3. In this group of fourth year students, a lower proportion of males completed the test than in first year. The number of students with a degree made up a slightly higher percentage of this cohort than previous samples (40%) and students were also older (relative to their stage of the course). The purge rate of the fourth year tests was lower than that of first years but the small number that were purged had high scores for meaningless items. In fifth year, 16 students completed the DIT-2 (1 was purged (6%)). Ten of these students had previously completed the DIT-2 in fourth year. All fifth year students that completed the DIT-2 were female. Their ages ranged from 22 to 34, 47% held a previous degree and 40% were US citizens.

Variable	Fourth year proportion	Fifth year proportion
Gender		
F	0.86	1.00
M	0.14	0
Age		
21	0.24	0
22	0.20	0.20
23-25	0.18	0.40
26 and over	0.36	0.40
Unknown	0.02	0
Nationality		
US Citizen	0.34	0.40
Not US Citizen	0.66	0.60
Degree held		
No	0.60	0.53
Yes	0.40	0.47
First language English		
Yes	0.86	0.93
No	0.14	0.07

Table 2.11: Proportional representation of demographic information of veterinary students in cohort 3 that completed the DIT-2

2.4.3.2 P and N2 scores

Means (and standard errors) for the different moral schema identified by the DIT are shown for all fourth and fifth year students that completed the DIT-2 in Figure 2.5 (fourth year n = 50, fifth year n = 15). The mean P and N2 scores for fourth year students were 37.3 (± 2.1) and 34.4 (± 2.0) respectively. The mean P and N2 scores for fifth year students were 42.00 (± 3.88) and 39.72 (± 3.36) respectively. There were a wide range of N2 scores in fourth year students, with the minimum being 7.3 and the maximum 66.4. This range was slightly narrower in fifth year ranging from 19.3 to 65.6. There were no significant differences in N2 or P scores for the demographic factors collected for fourth or fifth year students. With regards to additional measures, 82% of fourth year students made a choice on all scenarios (i.e. there were no 'can't decides') along with 40% of fifth year students.
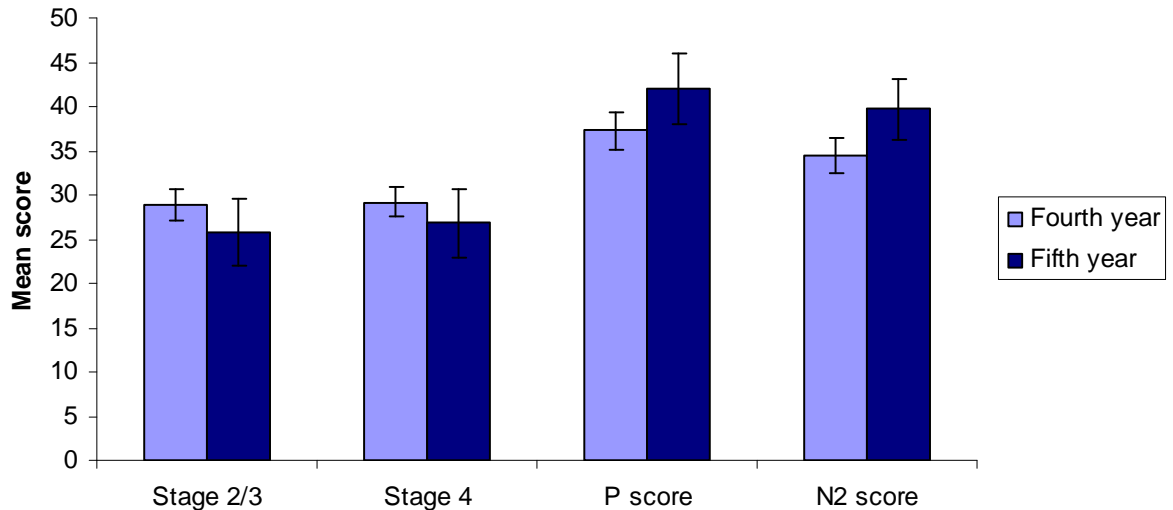
Figure 2.5: Mean DIT scores (+/- standard errors) for fourth and fifth year students

For students that completed the DIT-2 in both fourth and final year (n = 10), the mean P scores were 44.32 ($\pm$ 5.25) and 42.00 ($\pm$ 5.49) respectively. The mean N2 scores, in fourth and fifth year students were 43.78 ($\pm$ 4.31) and 40.86 ($\pm$ 4.37) respectively.

2.4.3.3   Type indicators

In fourth year, the highest proportion of students were allocated Type 6 with the next largest proportion Type 2. These two types are both transitional profiles, and 72% of this cohort had transitional profiles in fourth year. In fifth year, Type 6 again made up the largest proportion of respondents but this time followed by Type 7 (a consolidated profile type). No respondents were Types 3 or 5, which are both transitional profiles. In fourth year the largest proportion of respondents relied on post-conventional level reasoning and in fifth year this was also the predominant level (Figure 2.6a and b). Around a quarter of respondents relied on pre-conventional moral reasoning in both years, whereas there appeared to be a move away from conventional level reasoning (though this was not significant).

a)

b)
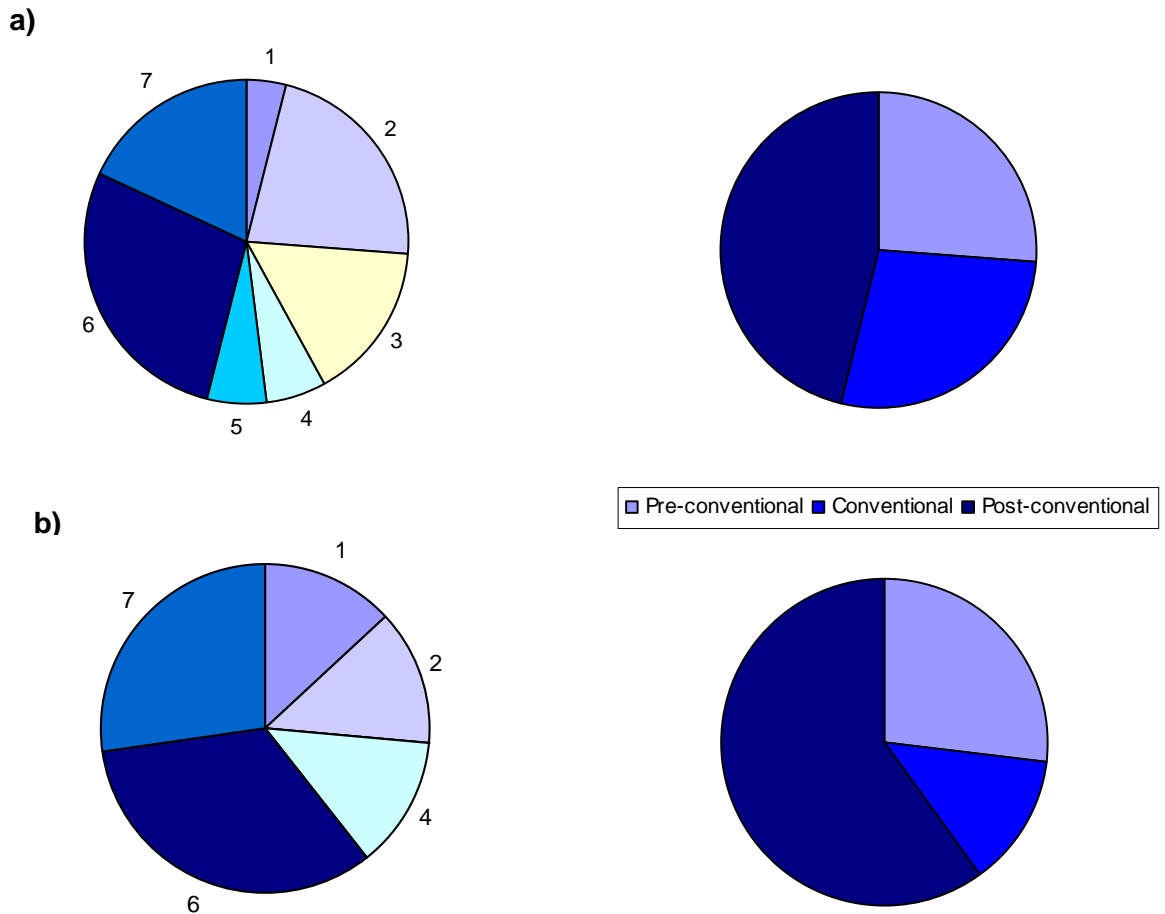
Figure 2.6: Proportion of students assigned each Type Indicator and each level of moral reasoning in a) fourth year and b) fifth year

Fourth year n = 50, fifth year n = 15

2.4.4   Impact of curriculum

2.4.4.1 Stage in curriculum

There was no difference in P and N2 scores between fourth and fifth year students who sat both tests (paired t-tests). No significant difference was found in either the P or N2 scores between first and fourth year students (cohort 2 pre-DIT scores used) (2 sample t-tests) (Figure 2.7). When year was entered as a covariate into the GLM, females scored higher than males (p = 0.038) and those with degrees scored higher than those without degrees (p = 0.004). A cross-sectional comparison of fifth year scores to first year scores (Cohort 2 pre-DIT scores) did not find a significant difference in P or N2 scores (two sample t-tests)

but the small size of the fifth year sample reduces the power of the test. There were no differences in the proportion of students assigned to each moral reasoning level in fourth year and first year, or fifth year and first year (chi-square tests). However, fourth years had a higher proportion of transitional profiles than first years (chi-square, p = 0.001). The difference in number of 'can't decides' in first year and fourth year approached significance (chi-square test, p = 0.087).
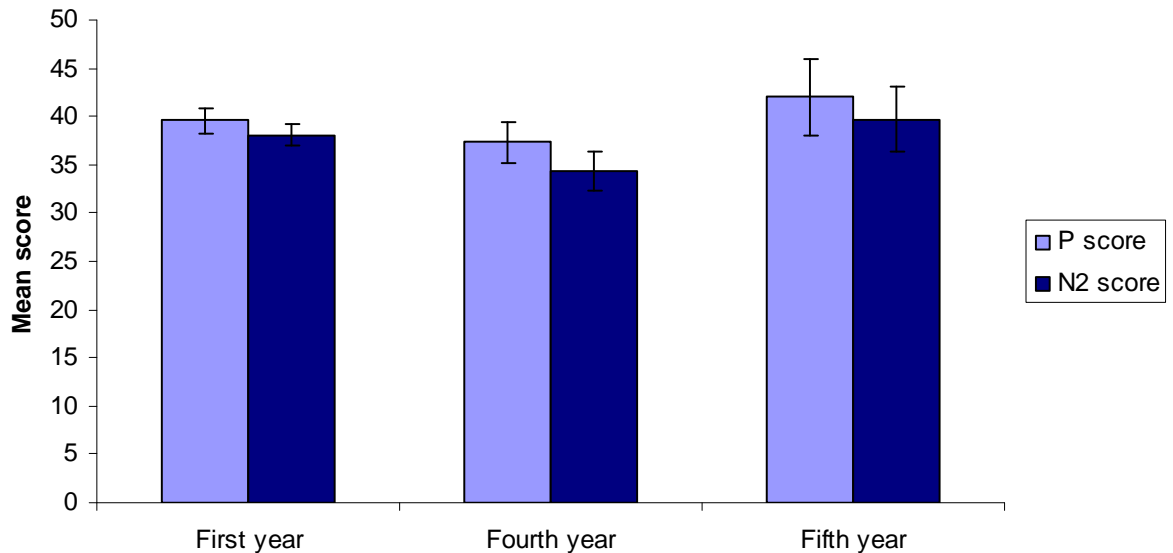
Figure 2.7: Mean P and N2 scores (± standard errors) of students at different stages of the veterinary curriculum

2.5   Discussion

2.5.1   Pilot of moral reasoning measures

Initially two tests of moral reasoning were used, the SRM-SF and the three-story DIT. The results of the SRM-SF showed that the majority of students displayed predominantly Stage 3 moral reasoning (the lower level of conventional moral reasoning where ethical considerations are bound up in maintaining relationships and mutual trust). It has been argued that Stage 3 moral reasoning is inadequate for people living in a society that adopts diverse values (Gibbs et al., 1992, p5). Previous studies applying the SRM-SF to university students have reported a global stage mean of 3(4), but these students were from all years of university rather than first years (Basinger et al., 1995). Results of an American study

(Self et al., 1993b) on veterinary students found that the first year mean score on the SRM-SF was 3.44 (GS 3(4)) and in fourth year was 3.66 (GS 4(3)), similar to the values generated in this study. Given that US students have already completed a college degree and that Gibbs (personal communication) thought there may be a ceiling effect when using this test in university students, the expectation would have been that the majority of students would have averaged Global Stage 4 (mean score 3.75 and above). Possibly, because this test does not measure post-conventional moral reasoning, reasoning of this type is present but not detected. Alternatively, the format of the test (respondents are not presented with ethical dilemmas) may not elicit the highest levels of moral reasoning. As the scoring manual does not include examples of statements considered to use post-conventional moral reasoning it is not possible to confirm this. Other possible reasons for the lower than expected scores seen here could be that students had difficulty in articulating their own justifications (and in this sense producing their own reasoning may be more difficult than recognising statements of importance), or, because they were not told the reason they were taking the test they may have regarded their answers as unimportant or inconsequential. The fact that the SRM-SF was not suitable for investigating moral reasoning at the highest level (post-conventional) and the scoring was time-consuming and open to a degree of subjectivity contributed to the decision that this test would not be taken forward for use in the rest of the study. The DIT was considered the best option for providing a standardised test of moral reasoning for the remainder of this study because of interest in whether gains were produced in post-conventional moral reasoning, and it has been widely and successfully applied in other similar studies, displays good reliability and is easily objectively scored.

2.5.2 Moral reasoning levels on entry to veterinary education in the UK

Scores for both first year cohorts using the DIT were similar. However, the DIT-1 used in cohort 1 resulted in a high purge rate, which indicates that many of the responses were unreliable. Expected purge rates are between 5 and 15% (Rest, 1993) and the purge rate from this group was up to 29% for students that completed both the pre and post-EMS DITs. For this reason, the longer DIT-2 was used in the remainder of the study. Rest (1993) stated that P scores of senior high school students average in the 30s while college students' P scores (USA) (equivalent to undergraduate students studying for bachelor's

degree) average in the 40s. The mean P score in first year students that completed the DIT-2 (39.6) corresponded with the DIT norm for students who had recently left high school. Nevertheless, there was considerable variability in P and N2 scores (P score range 14.0 to 70.0, N2 score range 8.9 to 63.4). This was also the case in a study of first year dental students in the USA (Bebeau, 1993). The diversity in veterinary student populations has been highlighted (Pinckney et al., 2001) and this cohort was typically diverse with a mix of American graduates and UK school leavers. Perhaps unsurprisingly, degree holders had higher N2 scores than non-degree holders as educational level has a powerful influence on DIT scores (Thoma, 1986). No formal data was collected as to what exposure to ethics or philosophy courses students had encountered previously but anecdotally some students had studied these subjects and this would be likely to affect their test results. Effects of having a degree were not seen in SRM-SF responses. However, as the SRM-SF does not measure post-conventional level reasoning it might be that the difference in degree and non-degree holders was most pronounced at this level.

As intimated, in America students complete an undergraduate college degree before entering a professional degree programme such as veterinary medicine. Most studies on students utilising the DIT have been carried out in the USA. In a comparison of students of other professions with UK veterinary students, the only UK study available was carried out with pharmacy students (Gallagher, 2011). First year veterinary students scored higher in this study than first year pharmacy students, indicating that veterinary students may have higher than average moral reasoning scores on entry to veterinary school.

In previous DIT studies, females have often been found to score higher than males (Self et al., 1995; Self et al., 1996; Latif, 2004). This was not the case in first year students in this study though the result did approach significance in cohort 2. It may be that UK male veterinary students do not lag behind their female counterparts on this skill but the small number of participating males make comparisons unbalanced and any differences could have been masked by large standard deviations as a result of the diversity in this population.

Within professional higher education, ethics teaching is primarily focused on reaching the advanced level of post-conventional moral reasoning as it is positively associated with professional behaviours such as improved clinical performance (Sheehan et al., 1980; Krichbaum et al., 1994). It is expected that students entering university are already reliant on conventional level moral reasoning as movement to this level typically occurs at around

age 10 (Kohlberg, 1968). The largest proportion of students in each cohort relied on post-conventional moral reasoning. If students entering veterinary education are already reliant on post-conventional moral reasoning they may improve little through exercises and tutoring. The aim with these students is not necessarily to develop their reasoning skills to higher levels but to develop them in a profession-specific way, and to ensure that veterinary education does not diminish these skills.

However, the DIT revealed that not all students relied on post-conventional or even conventional moral reasoning, with some students in all cohorts reliant on pre-conventional moral reasoning. As stated, this level of reasoning is usually seen in children younger than 10 and it is presumed that by age 12 this level is no longer central in moral reasoning (Rest et al., 2000). As the aim of any education programme is to attain acceptable levels of knowledge or skills in all students, the focus for these students must be to improve their moral reasoning skills to a level more akin to that expected of graduate students through their veterinary education. These marked differences in ability add weight to the idea that testing students for moral reasoning level when entering veterinary school might have value, because it would allow tailoring of educational approaches. At present it is not something that is assessed routinely and as such interventions pertaining to this skill are not implemented at early stages of the course. In one dental school, first year students sit the DIT on entry to the course (Bebeau, 1993). They are given personalised feedback on their moral reasoning ability and, in addition, if a student has a P score lower than 35 then intervention by faculty is initiated to raise students awareness of the importance of moral principles in solving difficult ethical problems. This tends to improve their moral reasoning score but has resource implications. Given the ethically challenging nature of the veterinary profession, it could be argued that such a strategy would be useful in veterinary undergraduate courses.

2.5.3   Moral reasoning level in first year of clinical study

The mean P score for fourth year students was lower than the DIT norms for students of professional courses (Rest, 1993). Furthermore, a quarter of the fourth year students sampled relied on pre-conventional moral reasoning, which is concerning. It is plausible that veterinary students regress to very simple forms of reasoning when faced with difficult dilemmas. As fourth years begin clinical work they become more aware of their legal

obligations and this may guide their assessment of a situation and lead to a more formulaic approach. By choosing the DIT statements that adhere to laws, their moral reasoning level would be scored lower (based on following authority). Furthermore, with reference to the importance of students fitting in to hierarchical clinical teams, it has been postulated that in order to behave in the way expected of them, clinical medical students must use reasoning equivalent to pre-conventional reasoning (please authority figures, avoid punishment, retain self-interest) (Morton et al., 1996) and veterinary students are also exposed to hierarchical structures to some extent during their clinical training.

Alternatively, the high proportion of pre-conventional, in particular Type 2 respondents, may be a result of the rigidity of the DIT. Kohlberg (1976) describes the presence of 'Stage 4½', a transitional stage, common in college students, as "a no-man's-land between rejection of conventional morality and the formulation of non-conventional or universal moral principles." (Kohlberg, 1976, p43). This stage was originally mistaken for Type 2 reasoning. As the DIT is a recognition measure, the level of reasoning indicated by the chosen statement is predetermined. This may mean that Stage 4½ is not identified and classified as Stage 2. Stage 4½ is characterised by cynicism and disillusionment, which is something that has been observed in medical students during the clinical years (Hren et al., 2006) and is one possible explanation for why several students were classified as Type 2.

A comparison of the results of this study with a similar study on UK pharmacy students (Gallagher, 2011) shows that first year veterinary students scored higher than their pharmacy counterparts on the DIT but by fourth year this differential was no longer apparent, with fourth and fifth year veterinary students scoring similarly to fourth year pharmacy students. In each year of the pharmacy course, unlike the veterinary course, students had been presented with ethical dilemmas and were encouraged to engage in ethical discourse about these dilemmas. Recent studies, cited by Bebeau (2002), investigating curricular effects often found no effect on moral reasoning scores of curricula that had no specific ethics teaching. There is also suggestion of a homogenising effect, for example, fourth year students had similar scores irrespective of whether they had a degree. Self and colleagues (1993) report a 'homogenizing effect' where students become more similar to each other as they advance through their university training, most probably because students want to fit in and conform to group norms. The results of the present study stress the importance of introducing ethical teaching early and reinforcing ethical thinking throughout the curriculum if veterinary students' moral reasoning is to continue to improve.

The majority of fourth year students displayed a transitional profile (indicating disparity in responses). They may be more likely to be transitioning from one stage to another as their clinical experience expands and they are faced with new challenges. Thoma and Rest (1999) highlight that different teaching approaches may be beneficial to students at different stages of consolidation and transition. They theorise that higher scoring individuals with consolidated profiles may benefit from being challenged on their viewpoints whereas a low scoring individual going through a stage of transition could be overwhelmed by this approach, leading to confusion and disengagement with the subject. Lower scoring students may benefit from teaching that draws attention to the ethical issues within scenarios and demonstrates the use of frameworks in making decisions. A simple learning exercise aimed at increasing ethical awareness could benefit lower scoring students in particular and help to bring their competency level up to acceptable norms.

2.5.4   Curricular effects

The fourth and final year scores were no higher than those of first year veterinary students. Through general maturation and university education, an increase would be expected between the beginning and end of the course of three points on the P score (Self et al., 1996). The DIT measurement was obtained from fourth year students before they had undertaken any of their clinical ethics tuition, and in the intervening years little class time is devoted to ethics and ethical thinking. Without formal ethics education it appears veterinary students do not make the advances in moral reasoning expected from a university education. There is evidence that a lack of stimulation of ethical thinking leads to regression in moral reasoning ability in veterinary students. In a study where veterinary students were used as a control group (so were not exposed to any ethics teaching) while medical students were exposed to case-based discussions of ethics (Self et al., 1989), the DIT scores of the veterinary students regressed during the period of study whereas the medical students' scores improved. Importantly, ethics courses introduced in the first year of professional courses have resulted in improved ethical development, which is then retained for the remainder of the course (Self & Olivarez, 1996; Goldie et al., 2004).

Several studies report an increase in scores as students progress through professional degrees (Self et al., 1989; Self et al., 1993b; Duckett et al., 1997; Latif 2000; Gallagher, 2011). However, only one of these studies was on UK students (Gallagher, 2011). UK

students are disadvantaged in this regard because they enter professional degrees straight from high school so they enter at a younger age and lower educational level than students in other countries. Therefore (if adhering to the DIT norms), UK veterinary students are expected to achieve greater gains in this area over the same time period, and presumably with the same heavy workload, as older, more experienced students. It could therefore be said that introducing educational approaches that aim to improve ethical development are even more important in the UK than they are in the USA.

The lack of increase in moral reasoning between students at the beginning and the end of their veterinary education indicates that veterinary education is failing to promote moral development. A similar result was found by Self and colleagues (1996) in the USA where they did not see the expected increase in score (rather than a decrease in score) with completing a professional degree that included an ethics course and small group discussions on ethical dilemmas. It would have been interesting to compare the scores of the two studies but no standard deviation was provided in the American study so it was not possible to calculate a confidence interval. Previously, regressions in moral reasoning ability have been found as professional students progress from first to fourth year. In medicine, third year students have been found to have the highest post-conventional scores of the six years of study and Hren and colleagues (2011) concluded that clinical training resulted in a decrease in scores back to conventional levels (maintaining norms). Reasons offered for this regression in medical students' moral reasoning were disillusionment with the course; the strict hierarchical system (with students at the bottom), where conforming to norms makes it easier to fit in; and the hidden curriculum, where students are exposed to differing views to that of the formal curriculum, leading to cynicism and moral relativism (belief that no view is more defensible than any other and a mentality of 'anything goes'). Furthermore, cynicism has been shown to be correlated with lower post-conventional reasoning scores (Hren et al., 2006). These traits may apply to veterinary students.

Although the final year students had undergone formal ethics teaching by the time of the re-test, including having the opportunity to discuss ethical-based case-studies, the indication is that clinical ethics teaching in place at this university is not having the desired impact on veterinary students' moral reasoning abilities. Reasons for this may be that ethics teaching is being introduced at too late a stage in the curriculum when much of students' ethical development has already occurred and that when it is introduced there is not enough of it. However, a further test of a greater number of students would help to clarify this. The lack of difference in scores between first and fourth year students must be

interpreted with caution as the study was cross-sectional. To ascertain for certain whether veterinary education is inhibiting moral reasoning, the first year cohort would have to be tested again at the end of their fourth or final years. Although no differences in the scores of males and females were found in students of the same year group, when year was controlled for females scored higher than males. This result is consistent with the claim that the higher the educational level, the larger the difference in score between the sexes (Bebeau & Thoma, 2003). However, this is based on a small number of males.

Although these results are worthy of note and allow comparison with students of other professions, they do not provide information on how these students would act in veterinary scenarios. The scenarios in the DIT bear little resemblance to the dilemmas faced by veterinary surgeons. For example, the scenario involving the question of whether or not to overdose a terminally ill patient is the closest one to a veterinary euthanasia scenario. However, in the DIT scenario, knowingly carrying out euthanasia on a person would be illegal, whereas in veterinary medicine euthanasia is an accepted and in some cases legally proscribed action (for example, to end unnecessary suffering). Thus, the ethical norms and legal backdrop are different in the two professions. The fact that an animal's value is not universally agreed upon makes it even more important that veterinarians are able to reason through ethical dilemmas as the rules governing treatment or correct actions are not always clearly defined. The moral judgement required by veterinarians on a day to day basis is not represented by the scenarios in the DIT. That said, these tests are designed to be able to predict ethical behaviour in any profession (Tsai et al., 2009) and in the absence of a veterinary specific measure the DIT provides an easily administrable, well-validated measure to investigate moral reasoning levels. In the future, creation of a veterinary specific ethical reasoning measure would greatly aid research in this area.

2.6   Conclusion

These results provide valuable information on ethical reasoning ability in veterinary students at Glasgow University. The findings indicate that veterinary education in this UK institution is not currently having the desired effect on moral reasoning scores. Introducing case-based ethics teaching in the clinical years may be too late, there may not be enough emphasis on ethical development within the curriculum and students may already have become cynical or entrenched in positions that are difficult to alter. Clinical teaching also

revolves around small animal ethics whereas there are many ethical issues in large animal practice as well. To address this shortfall, educational approaches that introduce ethical concepts and encourage reflection on ethical issues should be introduced early in the course. Developing a reflective tool that prompts consideration of a wide range of ethical perspectives is one way of promoting ethical awareness (see Chapter 3). The results described here show that the DIT provides a reliable, objective measure with which to evaluate the success of such an intervention.

Chapter 3 – Development of the Animal Welfare Associated Reflective Exercise (AWARE)

3.1 Introduction

3.1.1 Independent learning approaches

Traditionally, courses in veterinary medicine used didactic modes of teaching (Howell et al., 2002; Lane 2008) and emphasised memorisation of a large amount of factual knowledge (Raidal & Volet, 2009). However, it has been established that other modes of teaching such as self-directed learning and experiential learning can be effective in veterinary curricula (Farnsworth, 1997; Rand & Baglioni, 1997; Howell et al., 2002; Martin & Taunton, 2005). Self-directed learning is *"where individuals take the initiative, with or without the assistance of others, for their learning"* (Knowles, 1975). Experiential learning centres on personal involvement and transforms one's own experiences into knowledge that can be carried forward to the next learning experience (Parker et al.,1995). Both types of learning promote deeper learning (Spencer & Jordan, 1999), in that students understand associated concepts and do not solely memorise information. In professional courses in particular, self-directed learning is considered to help foster independent life-long learning (McLennan, 2003), and can make the transition from pre-clinical to clinical stages easier by providing more obvious associations between basic science and real-life cases (Blumberg, 2005; Raidal & Volet, 2009). Self-directed learning has also been found to correlate with academic success in pre-clinical veterinary students (Ryan et al., 2004). In animal science, a degree that, like veterinary medicine, centres on the well-being of animals, experiential learning has been found to stimulate the interest of students (Reiling et al., 2003), increase motivation (Kubiak et al., 1988), increase understanding by linking theory with practice (Marshall et al., 1998) and lead to long-term retention of knowledge (Kubiak et al., 1988). All the learning outcomes listed above were measured using student and faculty evaluations. Both animal science and veterinary students tend to evaluate experiential learning very positively (Reiling et al., 2003; Adams & Ladner, 2004). The positive attitude of veterinary students towards experiential learning is likely because there is a tangible link between these learning experiences and their role as a practising veterinarian. Experiential learning has resulted in animal science students becoming more

aware of the responsibilities involved in caring for livestock (Reiling et al., 2003) and more confident in handling livestock (Marshall et al., 1998). Experiential learning has also successfully improved veterinary students communication skills although students were opposed to this form of learning beforehand (Brand & Bateman, 2006). In another study using role-play, as well as improving veterinary students' communication skills, the authors claimed that difficult cases encouraged them to think about their own ethical stance on such cases (Adams & Ladner, 2004).

3.1.2   Impact of Extra Mural Study

In the veterinary course, practical experience is crucial to developing clinical skills (Taylor & Barnes, 1998a) and providing students with work-place experience in the form of placements such as extra-mural study (EMS) provides an ideal platform for experiential learning. Students' experiences on EMS placements can have a strong influence on their perceptions of normal practice. Although experiential learning with animals can have many positive benefits (Reiling et al., 2003; Marshall et al., 1998), students may also encounter unethical behaviour towards animals for the first time, leading to situations in which they do not feel comfortable or that they find distressing. In extreme cases, these may result in the student having a spontaneous moral reaction to something they see; that is they have a strong, immediate emotional reaction to something that strikes them as distasteful or morally wrong (Ohman & Ostman, 2008).

These experiences can be distressing and if not resolved could lead to moral distress (Corley, 2002). Moral distress is an emotionally negative state brought about when one witnesses what they judge as unethical behaviour but is not free to act because of their subordinate position, or other barriers (Epstein & Delgado, 2010). Similarly, moral stress, as described by Rollin (2006) in relation to veterinary medicine, may arise as a result of a practitioner being asked to carry out actions that fundamentally conflict with the reasons they entered the profession in the first place, for example, euthanising healthy animals. Moral distress is most often referred to in nursing because the nature of the role means that often nurses have direct responsibility for patient care but may lack authority to make decisions about that patient's care. This situation is also likely to be experienced by veterinary students during EMS. No studies have investigated moral distress in veterinary students but a study on medical students found that they frequently experienced moral

distress and one contributing factor was their low position in the medical hierarchy (Wiggleton et al., 2010). The researchers hypothesised that this low position in the hierarchy meant that students would feel less responsible but the opposite appeared to happen, highlighting the real risks to student well-being in these situations. Although students may suffer negative emotional consequences as a result of ethically problematic situations experienced during EMS, currently there are no strategies in place to help students resolve those feelings.

3.1.3   Using reflection in teaching

One way of helping students deal with negative experiences could be to give them opportunities to reflect on them. Reflection [revisiting and analysing experiences in order to better understand them and to learn from them (Plack et al., 2007)] helps individuals cope with difficult situations and manage conflict (Adams et al., 2006). Other advantages are that students achieve deeper learning and develop critical thinking skills (Wald et al., 2009); learn to view situations from multiple perspectives (Plack et al., 2007); and improve their decision-making skills and, as a result, their professional interactions (Adams et al., 2006). Common teaching methods used to develop reflection are diaries, journals and portfolios (Hannigan, 2001; Rees & Sheard, 2004); reflective assignments (Donaghy & Morss, 2000; Kidd & Nestel, 2004); face to face interviews and focus groups (Henderson et al., 2003; Driessen et al., 2005; Walther et al., 2007); and structured reflections such as significant event analysis (Bowie et al., 2004) and the use of critical incidents (Hagland, 1998).

Reflecting on practice is widely used in nursing and medical curricula (Hagland, 1998; Pearson & Heywood, 2004; Wald et al., 2009) but is not as common in veterinary courses. When it is employed it is normally incorporated into EMS portfolios (Mossop & Senior, 2008). Portfolios are collections of evidence of learning experiences along with reflections on those learning experiences. A portfolio is an example of a reflective tool but one that has a relatively free format and little structure. Portfolios have been successful in developing medical students' perceived abilities in reflective practice, self-directed learning, and ethical and legal principles (O'Sullivan et al., 2012). However, medical portfolios have conversely been found to have no significant impact on learning (Grant et al., 2007) and in a study of general practice registrars, many considered the portfolio unhelpful, they did not use it for reflection and they instead reflected in informal ways such

as through discussions with colleagues (Pearson & Heywood, 2004). The pressures of the working environment may mean that staff avoid the use of reflection tools due to the time pressures associated with them (Issitt, 2003). If the portfolio is not used to reflect and employed solely to record learning experiences then it becomes a logbook and not a reflective tool (Davis & Ponnamperuma, 2005).

After each pre-clinical EMS (PC-EMS) placement, veterinary students at the University of Glasgow are currently expected to write one A4 page of reflection on their PC-EMS experience as part of a wider portfolio. Recording their experiences may help students become more self-aware (Henderson et al., 2002) and allows them to record feelings or thoughts, which otherwise would not have a formal outlet. No structure is provided for the report, and there is no guidance as to what should be included. Students review their reflections with their mentor (a member of veterinary school staff who must be a veterinarian) but no assessment of the report is made. This is mainly because assessment of reflections is a contentious issue and as the reflection is a personal record, assessing it may influence what students are prepared to share (Boud, 2001). Further issues that inhibit assessment are that reflectors may be hesitant to write negative comments about others or their practice if they feel there may be negative ramifications as a result (Issitt, 2003) and usually no training will have been given to mentors in how to formally assess reflections.

3.1.4   Significant Event Analysis

Aside from portfolios, a common approach to introducing reflection into curricula is through reflective assignments. These reflective assignments are usually employed to help students reflect on challenging situations that can include ethical dilemmas (McAlpine et al., 1997) but more often than not focus on encouraging critical reflection of clinical practice (Donaghy & Morss, 2000; Kidd & Nestel, 2004; Grant et al., 2007). A structured reflective assignment used with physiotherapy students improved their self-directed learning readiness (Mori et al., 2008) and guided feedback on reflections written by teachers while mentoring a trainee led to an increase in their moral reasoning ability (Reiman & Thies-Sprinthall, 1993). Structured reflection in veterinary medicine has never had an ethical focus but it has been used as a tool to investigate collaborative learning (Thurman et al., 2009) and to aid students in reflecting on a communications exercise (Adams et al., 2006). For inexperienced reflectors, such as pre-clinical veterinary students,

providing some level of structure within a reflective assignment could help them achieve a better learning outcome (Grant et al., 2007).

One method of structured reflection that has been successful is the Critical Incident Technique first used by Flanagan (1954). By structuring interview questions so as to educe memories of specific instances of success or failure, Flanagan was able to identify the underlying causes of pilots failing in training (Bradley, 1992). One study on engineering students used focus groups to elicit critical incidents (Walther et al., 2007). The discussion was guided by a facilitator that encouraged students to recall their particular incident using prompts on the situation, their feelings, their interpretation of what happened and their decisions as a result. Students felt the exercise resulted in decisions to change their future behaviour and to change the way they would approach learning in the future. These are important intended learning outcomes of reflective exercises and demonstrate the value of such an approach. Although this approach has potential, facilitating focus groups for large numbers of students is extremely time-consuming. Perhaps a more suitable approach for large groups of students would be to use a written form of the Critical Incident Technique known as Significant Event Analysis (SEA). A significant event is one of importance to the person who experienced it and is often an unusual event (Cohen et al., 2007) but can be one where the outcome or action was positive or negative. SEA uses prompts to create a structure for the student to follow. Typical stages within a SEA would include a description of what happened, how the student felt about the incident, some insight into what went well and what went badly and would conclude with musings about future action whether this be new learning objectives or proposed changes to practice (Bowie et al., 2004). Structuring the reflection can make the process of reflection less daunting (Grant et al., 2007). It could also result in more rounded reflections and the structure may make assessment more straightforward. In a study on physiotherapy students, students made specific references to the importance of the prompter questions in enabling them to think further about their experience (Donaghy & Morss, 2007). Concentrating on a particular topic may also help to make it easier for students to focus their writing. Thus, a reflective tool based on SEA could have value for first year veterinary students and could provide an outlet for them to reflect on the ethical dimension of difficult experiences witnessed during PC-EMS.

3.1.5   Models of reflection

As SEA can lend structure to reflection, so too do reflective models (Tate, 2004). Various models of reflection have been proposed from the simple two step process of Boud and colleagues (1985) to the lengthy Johns' cycle (1994) with its five stages and additional prompter questions. Gibbs' reflective cycle (1988) and Kolb's experiential learning cycle (1984) (see Figure 1.1) are also relevant. When developing a reflective tool, building it around a model of reflection was considered important. As laid out in Chapter 1 (section 1.4.2), Kolb's experiential learning cycle was seen as the most appropriate of these cycles with which to frame a reflective learning tool. Johns' framework is too detailed to allow for assessment of reflection (Pee et al., 2002) and Gibbs' cycle is effectively a more detailed version of the Kolb cycle with more emphasis on later stages of reflection, which are less relevant to novice reflectors. The Kolb cycle has been suggested as a teaching tool in disciplines outside veterinary medicine (Stice, 1987; Greenberg & Blatt, 2010) and it could be particularly relevant when students are moving from teacher-led training to more independent learning approaches such as self-directed learning during PC-EMS.

3.1.6   Rationale and objectives

Methods that focus on developing lifelong learning skills have been successful with veterinary students (Rand & Baglioni, 1997; Howell et al., 2002; Ryan et al., 2004). PC-EMS provides opportunities for experiential learning and is currently an area of veterinary education that is not fully utilised. Using experiences on PC-EMS to formally aid in ethical development would begin to bridge the perceived gap between learning on PC-EMS and the formal curriculum. Recording the issues experienced by veterinary students could also provide information on the types of ethical issues faced by veterinary students during PC-EMS placements. Teaching ethics using experiential methods may be more successful than those used for veterinary students in the past because it reveals the relevance of the subject to their role. Creating a learning tool that incorporates experiential learning and reflection while raising awareness of ethical perspectives and frameworks could be a successful approach to improving ethical awareness and development in veterinary students. Introducing ethical reflection at an early stage of the veterinary course may also be worthwhile because many early ethical education interventions in other disciplines have seen sustained improvement in ethical development (Hebert et al., 1992; Self & Olivarez, 1996; Goldie et al., 2004).

The objectives of the study were to:

1) create a novel, reflective learning tool to improve ethical reflection in pre-clinical veterinary students and introduce it as an alternative to the unstructured EMS report currently in place

2) pilot the prototype tool with a small group of first year veterinary student volunteers

3) modify the prototype following student and expert evaluation

The hypothesis was that reflecting on these experiences would help students cope with the emotional responses elicited and would, in turn, maximise the learning gained from their PC-EMS experience by improving their awareness of ethical issues relevant to veterinary medicine.

After completing the reflective learning tool, students should be:

- able to identify relevant animal welfare issues on farms
- familiar with ethical concepts associated with welfare considerations specifically, affected parties, interests, a range of perspectives and three animal ethics frameworks
- able to evaluate actions from a moral standpoint and construct sound arguments to defend particular actions or points of view

In addition, the reflective learning tool aims to:

- improve awareness of animal ethics frameworks and their application to animal welfare issues
- encourage ethical and critical reflection of students' feelings regarding significant events witnessed during PC-EMS
- promote understanding of competing ethical viewpoints and foster awareness that views that oppose their own can be valid
- increase the level of ethical reflection seen in written PC-EMS reports

3.2   Developing a novel reflective learning tool

3.2.1   Development and trial of the AWARE

3.2.1.1 Creating the prototype

The majority of literature available on the use of reflections as a learning tool was from the medical profession (e.g. Henderson et al., 2002; Boenink et al., 2004; Kidd & Nestel, 2004; Driessen et al., 2005; Grant et al., 2007). The structure was closely based on SEA. Ideas for types of prompts used previously to elicit desired responses were sourced from medicine (Kidd & Nestel, 2004; Bryan & Babelay, 2009), nursing (Harris, 2008), physiotherapy (Donaghy & Morss, 2007; Mori et al., 2008) and engineering (Walther et al., 2007). A draft outline was peer reviewed by academics at Glasgow University, Bristol University and the Royal Veterinary College (n = 5). The final version of the prototype was pre-tested by three academics at Glasgow University and one final year student to assess the comprehensibility and clarity of the prompts. After further amendments based on testing feedback, the final prototype was issued to students.

The tool, named the Animal Welfare Associated Reflective Exercise (AWARE), took the form of a structured reflection that focused on the ethical basis of an animal welfare issue encountered by the student on a PC-EMS placement on either a cattle, sheep or horse unit. The final prototype consisted of five sections set out over two A4 pages along with supplementary notes on animal ethics frameworks and a resource section (Appendix B1). The first section collected information on gender, age, nationality, whether the student held a previous degree, area of upbringing (whether urban, rural or on a farm), details of the establishment where the student was undertaking the PC-EMS placement, the duration of the placement and their previous EMS/animal handling experience.

The second section (named 'Animal Welfare Related Event') invited students to identify either 1) a particular event involving human action that they felt impacted animal welfare, either positively or negatively, and had ethical implications or 2) a more general animal welfare issue that through human action impacted a group of animals (this could be the entire herd/flock), either positively or negatively and had ethical implications. Generally, an event impacted one or two animals and was an isolated occurrence (e.g. a lame cow that was not given veterinary treatment) and an issue was a more general welfare issue that impacted a group of animals (e.g. tail-docking of lambs). Students were asked to give an

account of the situation, including the parties involved and the outcomes. Identifying the event/issue is the self-directed part of the exercise as the student had to find a relevant occurrence to report on. To avoid confusion between the terms 'event' and 'issue' when referring to the occurrence the student chose, hereafter when discussed in general terms throughout this thesis the animal welfare event or issue will be referred to as an 'incident'. This section was designed to set the scene but was not expected to be overly long.

In the third section (named 'Personal Reflection'), students were asked to describe their initial feelings in response to the experience, to reflect on the root of their feelings and then to consider why the particular action was taken. This section was designed to capture expression of spontaneous moral reactions. It was stressed during introductory training (see section 3.2.1.2 of this chapter) that there was no right or wrong answer here. The aim was that the first prompt would result in responses containing emotive words (e.g. shock, surprised, upset). The second prompt was designed to encourage students to think more deeply about the particular parts of the experience that elicited those feelings (e.g. did not agree this was the best action in the circumstances, had never experienced anything like this before). Having reflected on their own personal reaction, students were then prompted to consider why the particular action was taken (e.g. due to economic constraints, was standard industry practice). The action described was most likely taken by a farmer (or member of farm staff) but in unusual circumstances could have been taken by the student themselves. This prompt was designed to facilitate reflection on other people's reasons for acting as they do and to initiate thoughts about wider considerations. It was hoped that allowing students to reflect on difficult situations would minimise the negative effect of the experience.

The fourth section (named 'Ethical Viewpoints' in the prototype but later changed to 'Ethical Reflection') looked at the ethical basis of the critical incident in more detail and asked the student to identify the parties affected and their principle interests, to consider the situation from different perspectives by providing two opposing arguments relating to the action taken, as well as relating their view on their critical incident to an ethical framework. The aim of this section was to incorporate ethical principles into the students' reflections, encourage them to construct defences for both sides of an argument and in turn improve their awareness of the ethical dimensions of incidents centring on animal welfare. Affected parties that students were expected to identify were the animal and the farmer (or stockperson). Other possibilities depending on the situation were a veterinarian, the public or consumers, and the student themselves (if they were directly involved in the action). The

principle interest for the animal was to avoid pain or minimise suffering, whereas for the human parties affected there were a much wider range of possible interests depending on their particular stance (e.g. for the farmer it could be to avoid costly treatment but it also could be to minimise suffering of their animal). The interests identified would be reliant on the student's interpretation. For veterinary students to be able to resolve ethical dilemmas they must first be able to identify conflicts of interest (Williams, 2002). Students were expected to find it easier to construct an argument for the view they supported compared to constructing one for the opposing view. Encouraging students to think about views other than their own helps to make them more tolerant of other ethically valid approaches. Students were expected to consider the use of an animal ethics framework in relation to their own view on the situation, stating which one their view most closely resembled and why. The aim of this prompt was to encourage consideration of ethical frameworks in relation to animal welfare. Three ethical frameworks relevant to animal ethics were selected for use in the AWARE: contractarian, utilitarian and animal rights. Given that most of the PC-EMS placements were on farms, it was relevant to include a framework that considers animals to have no moral status and to be means to an end (contractarian), and frameworks that consider animals to have intrinsic value (utilitarian and animal rights) but that differ on the importance assigned to individual animals and the acceptability of harming one group to benefit another. This section required students to think about what sort of arguments supporters of different animal ethics frameworks use when making decisions, and to reflect on their own views on whether actions can be defended and on what grounds.

The final section (named 'Round Up') gathered information on the student's overall experience on the PC-EMS placement, specifically if it was the first time they had experienced this type of welfare incident, whether they told anyone about the incident, whether they considered what they would do in the future if faced with a similar situation and whether their views had changed as a result of their experience. These questions were considered important in framing the student's previous experience and therefore their expected reaction to a situation, as well as providing an idea of whether informal reflection (with friends or peers, for example) took place and whether any change in perception or behaviour as a result of the experience had occurred.

Kolb's experiential learning cycle (1984) was used as a model of reflection on which to base the structure of the AWARE. Each section of the AWARE relates to one stage in Kolb's cycle (Table 3.1).

Stage in Kolb's experiential learning cycle	Definition of stage	Corresponding section of the AWARE
Concrete Experience	Description of the experience	Animal Welfare Related Event
Reflective Observation	Reflection on how they felt about the experience	Personal Reflection
Abstract Conceptualisation	Learning from that experience and evidence of wider application of concepts	Last prompt in Personal Reflection and Ethical Reflection
Active Experimentation	Taking the knowledge gained and applying it to new situations	Round Up

Table 3.1: Proposed alignment of stages in Kolb's experiential learning cycle with AWARE sections

3.2.1.2 Recruitment and preparatory teaching

A short introductory presentation on the project was used to recruit volunteer students to help with the study. In return the students were offered an incentive of 100 print credits if they completed the exercise. The aim was to recruit around 30 volunteers to take part in the pilot study. This was in accordance with the sample size suggested by other authors as being suitable for pilot testing (McAlpine et al., 1997). The volunteers were invited to introductory teaching sessions by email. These sessions were run in three groups of approximately ten students. Teaching sessions lasted one hour and were given six weeks before PC-EMS visits commenced. The teaching sessions provided background information on the relevance of ethics in veterinary medicine, animal sentience and three animal ethics frameworks (contractarian, utilitarian and animal rights) as well as illustrating two worked examples of the AWARE using species not involved in the study (pigs and poultry) (Appendix B2). These species were used to avoid students copying the examples. Students were given printed handouts of the slides and the prototype AWARE. The AWARE was also emailed to them. Student volunteers were asked to complete the AWARE within two weeks of completing their PC-EMS placement and could submit it by email or in written form. Ongoing support was available to students throughout the data

collection period. All the completed AWAREs were anonymised and student matriculation numbers were used as identifiers.

3.2.2   Student evaluation

3.2.2.1 Focus groups

Once all the AWAREs had been submitted, 25 volunteer students were invited by individual email to a focus group and six attended. The focus group followed a structured question guide on their own experiences, the structure of the AWARE and their overall views of the exercise. The session was led by a welfare and ethics lecturer and detailed notes were taken by the principal investigator. The focus group comments were taken into account in refinement of the AWARE.

3.2.2.2 Online feedback survey

Emails were sent to students with an invitation to complete an online feedback survey (Appendix B3). The feedback survey was created using SurveyMonkey (www.surveymonkey.com ©1999). It comprised of 18 questions with the final question being a free text comment box. The introductory questions asked about demographic information, the species used to complete the AWARE and the student's previous experience on farms as well as their reason for volunteering. Subsequent questions were based on variations of a five point Likert Scale e.g. 'strongly agree' to 'strongly disagree', 'nothing' to 'a great deal', or 'not at all important' to 'very important'. Most of the questions used a scale based on 'strongly agree' to 'strongly disagree'. The feedback survey was used to ascertain views on the structure of the tool, the supplementary notes, the teaching session and the impact of the exercise on specific abilities relevant to veterinary medicine such as recognising animal welfare and ethical issues and the ability to reflect on feelings and experiences.

3.2.3   Incident categorisation

Events and issues reported were subsequently allocated to themes. These themes were based on the DEFRA & SEERAD Codes of Recommendations for the Welfare of Livestock (sheep and cattle) and the Scottish Government's Code of Practice for the Welfare of Equidae (2009) and the National Equine Welfare Council's Equine Industry Welfare Guidelines Compendium for Horses, Ponies and Donkeys (2009). Within these codes there are various sections under which there are a number of sub-headings. The sections were used to assign incidents to broad categories. The sub-headings were then used to create more detailed sub-categories, e.g. in the section on stockmanship for cattle, the sub-headings are general, inspection, handling, transport, marking and clipping. Some sub-headings were assigned to a new category of husbandry practices (in this case marking and clipping were moved). The full list of categories and sub-categories used for cattle, sheep and horses are given in Appendices B4, B5 and B6.

3.2.4   Qualitative analysis

To explore whether the AWAREs aided students in completing a full reflective learning cycle, the AWAREs were also coded using the steps within Kolb's experiential learning cycle as nodes (Kolb, 1984). Student responses were examined for evidence of each stage in the cycle and relevant text was coded accordingly (Table 3.2). If the stage was evident then the student was considered to have reached that stage regardless of the percentage of text coded.

Stage in Kolb's cycle	Criteria used to decide if the student had reached this stage in the reflective process
Concrete Experience	Whether described an appropriate experience
Reflective Observation	Whether included how they felt and why
Abstract Conceptualisation	Whether considered actions in wider concept of farming or veterinary practice
Active Experimentation	Whether they generalised the knowledge gained from their experience and discussed it in relation to wider societal impacts such as relevance to the industry of farming or to the profession of veterinary medicine, or to proposed future action.

Table 3.2: Definitions of nodes representing steps in Kolb's experiential learning cycle

3.2.4.1 Moral reasoning

As part of the pilot study, volunteers completed one of two ethical reasoning tests, the 3-story DIT-1 or the SRM-SF, before and after completing the AWARE (for details of the methods and tests used, see section 2.3.1.1 and 2.3.2.1).

3.2.5   Expert review

After the pilot study, expert guidance was sought on the approach taken to gain ideas on how to better structure particular areas of the tool to maximise student engagement and tool effectiveness. Comments and views from the feedback survey and focus group, as well as findings from the analysis were used to prepare questions for an expert review pack. A list of experts was compiled through discussion with staff at Bristol and Glasgow Universities. Fourteen experts were approached, including academics from both philosophy and veterinary medicine, and veterinarians with an interest in animal welfare and ethics. All the experts were sent an email with an outline of the project, the teaching presentation, three examples of completed AWAREs (one where the student had engaged well, one where the student had engaged poorly and one using an event that had a positive impact on welfare) and a blank AWARE. The blank AWARE was annotated with specific questions to guide the experts on the type of advice sought. The email asked for the recipient to agree a time for a telephone conversation to discuss the study and/or email their comments. Seven experts contributed comments, five did not reply and two

responded but did not provide feedback. Comments were collated and discussed with two welfare and ethics lecturers based at different universities and two doctoral students, before incorporating them into a final version. For wider validation of the AWARE, see chapter 4.

3.3   Results of pilot study

3.3.1   Demographic information

Twenty-five first year veterinary undergraduate students completed the prototype AWARE (completion rate of 80%). Originally, 34 students put their names forward but 31 attended the teaching sessions and a further six did not complete the exercise. Demographic information for the volunteer group is shown in Table 3.3. The ages of the students who participated in the study ranged from 18 to 28 years old.

Variable	Frequency
Gender	
Male	6
Female	19
Nationality	
British	12
North American	7
Rest of the world	6
Upbringing	
Farm	0
Rural	14
Urban	11
Degree held	
Yes	8
No	17
Age	
18	4
19	4
20	5
21	1
Over 21	11

Table 3.3: Demographic information on students that submitted AWAREs during the pilot study

3.3.2   Overview of pilot study

All of the volunteers identified a suitable welfare issue, though some accounts were much more detailed than others. Although support was available throughout, only one student asked for help (clarity around whether the animal was an affected party or not). Of the volunteers, 92% recounted an experience on a sheep farm (related to PC-EMS during lambing) and 80% chose an experience that negatively impacted animal welfare (Table 3.4). There was an even mix of events and issues chosen. As might be expected with veterinary students the most common theme written about was health. However, there were a wide range of issues reported such as lack of veterinary treatment and poor nutrition during pregnancy in sheep as well as more widely accepted husbandry practices such as tail docking and castration of lambs. The most common reason for choosing a particular

situation was that the event or issue was painful or caused suffering for the animals. Other reasons were that it was a common issue on farms, that it was the only thing of note that the student saw, that it highlighted the difficulties of farming and that they thought the condition was easily treatable (where treatment was not given or the animal was euthanised).

Species	NoS	Incident	NoS	Welfare impact	NoS	Theme	NoS
Sheep	23	Issue	12	Negative	10	Breeding	2
				Positive	2	Feed & Water	1
						Health	13
		Event	11	Negative	8	Husbandry practices	4
				Positive	3	Management	1
						Stockmanship	2
Horse	1	Event	1	Negative	1	Stockmanship	1
Beef Cattle	1	Issue	1	Negative	1	Husbandry practice	1

Table 3.4: Classification of incidents impacting animal welfare reported on in the AWAREs
NoS = Number of students

Four students did not identify the animal as an affected party but all identified the farmer or stockperson involved. Only one student identified an affected party relating to wider society (beef consumers), all other persons identified were physically present in the reported incident. The majority of students (88%) stated that their view most closely resembled the utilitarian framework.

3.3.3   Qualitative Analysis

Analysis of the AWAREs using Kolb's experiential learning cycle found that all completed exercises included information on a 'concrete experience' as well as 'reflective observation' (Table 3.5). 'Abstract conceptualisation' was present in 88% of the AWAREs but the evidence of 'active experimentation' was sparse. 'Reflective observation' had the largest mean content with 'abstract conceptualisation' the next largest.

Stage of Kolb's experiential learning cycle	AWAREs where stage evident (%)	Mean content of the AWARE relating to this stage (%)
Concrete experience	100	13.0
Reflective Observation	100	23.5
Abstract Conceptualisation	88	20.0
Active Experimentation	8	0.4

Table 3.5: Presence and coverage within the AWAREs of each stage of Kolb's experiential learning cycle

Accounts of the experience differed in length from short accounts of one line to lengthy accounts of two or three paragraphs. Examples of two completed AWAREs are given in Appendices B7 and B8; one where the student engaged well and one where the student did not engage well based on the level of detail provided. It was hoped that the incidents chosen would elicit spontaneous moral reactions which could then be reflected upon and there was some evidence of these:

> "The process seems ridiculous…"
> (in relation to the clipping of cows' coats before being transported to market)

> "…the rubber ring method to castrate and tail dock lambs is very cruel and initially felt sorry, uncomfortable and was reluctant to carry on at first."

> "I was initially very shocked at the thought of chopping the lambs head off."

One student simply listed

> "Shock, Grief, Sorrow, Anger, Guilt"

whereas other students indirectly expressed their disapproval:

> "It was an innocent animal and it was obvious it was in pain."

> "I do not enjoy seeing animals in pain."

or their indifference to experiences they saw that impacted welfare:

"I was not shocked at the experience"

"but I had no remorse about leaving it instead of euthanising it."

These last two quotes give the impression that students are not able to express their emotions easily, recording what they do not feel rather than what they do. There was also evidence that even at this early stage of their training, procedures that go against best practice are seen as the norm:

"I was not surprised that no anaesthetic was given to the ewe, but I still felt sorry for her." (in reference to a farmer sewing up a vaginal prolapse)

This quote indicates the conflicts students have between their feelings towards the animal and their inability to act to rectify the situation. Furthermore, the students' inability to act could be expressed as frustration that could (if not offered support) lead to moral distress as evidenced by the following quote:

"However, I could not help but feel frustrated at my lack of knowledge and skills. This left me feeling that my ignorance and incompetence with this species resulted in unnecessary suffering and death."

A third of students responded to the final prompt regarding whether their perspective towards animals had changed with a simple 'No'. Some students did consider this section in depth:

"Sometimes it is necessary to take a step back to consider the big picture (especially with farm/production animals like sheep which are kept in large numbers). It is not always possible to feel for each individual animal."

and there was also suggestion of emotional hardening:

"It did however harden me to the harsh realities of farm life but not in a way that has made me uncompassionate."

However, the overall impression was that students' attitudes towards (farm) animals were not impacted by the experience (or that they wanted to give that impression):

"I have worked with animals enough to know this kind of thing happens and some times the kindest thing to do is put it down"

"as I was aware issues such as this occur regularly on farms."

This was supported by the consensus view of the focus group that if the incident was something they had seen before it was not likely to change their perspective.

3.3.4   Moral reasoning

Thirteen of the 25 volunteers completed pre and post SRM-SFs (93% response rate) and six volunteers completed pre and post-DIT-1 short forms (55% response rate). There was no difference in scores on the pre-tests between volunteers and non-volunteers (two-sample t-tests). There were also no differences in moral reasoning scores before and after completing the AWARE for either those that completed the SRM-SF or those that completed the DIT-1 short form (paired t-tests).

3.3.5   Student evaluation

3.3.5.1   Focus group

The focus group discussions (n = 6, response rate 24%) revealed that students found it more difficult to complete the exercise using a positive experience. One student said she had found it difficult to identify an issue to reflect on but another said she could have written about several. The students liked the structured questions and thought the instructions for completion were clear. One student thought that the personal reflection would be a helpful resource to revisit in years ahead to assess how her views had changed. When discussing individual prompts within the AWARE, the prompt that seemed to raise the most opposition was 'Why do you think you felt this way?'. Students thought this question was irrelevant. The students saw the application of ethics as relevant but did not see the theory as important. The students also indicated that utilitarianism was their favoured framework because the other two frameworks (animal rights, contractarianism) were seen as extreme. Students felt they were there to observe practice rather than take decisions on actions or offer opinion, and two students said they would have done things differently had they been able to.

3.3.5.2 Online feedback survey

The online feedback survey was completed by 22 students (88% response rate; 16 females and 6 males; age range 18-28). The level of previous on-farm experience varied between individuals from no previous experience to greater than three months. The most popular reasons given for volunteering to complete the AWARE included that it was seen as a good learning opportunity, that it would improve their EMS experience and that it would help with future assignments. Over two thirds of students (68%) recognised the importance of reflection as one of the learning objectives of PC-EMS. The introductory teaching session was well received (Figure 3.1). The introduction to ethical theory was set at an appropriate level with only one student considering it too basic and one finding it too complex. General opinion on the exercise was positive with 91% of students agreeing it was easy to understand and 86% agreeing that it was well laid out. The resource section was used by 41% of those that responded.
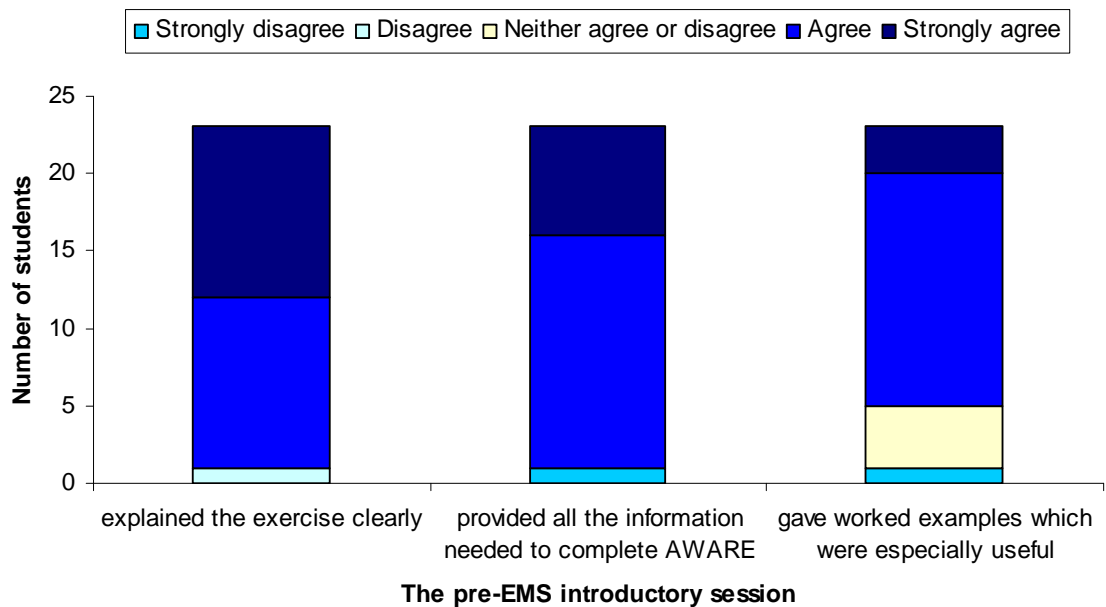
Figure 3.1: Student responses from an online feedback survey on the pre-EMS introductory teaching session

All students liked the self-directed aspect of the exercise (with 45% strongly agreeing) but 32% of students found it difficult to identify an issue to reflect upon. Importantly, the AWARE prompted 86% of the students to think more about animal welfare issues and the pressures on farmers and 83% agreed that it provoked reflection (Figure 3.2). Twenty-three

percent of students were apprehensive of writing negative comments about other people's actions and 9% reported that they felt uncomfortable disclosing their personal feelings.
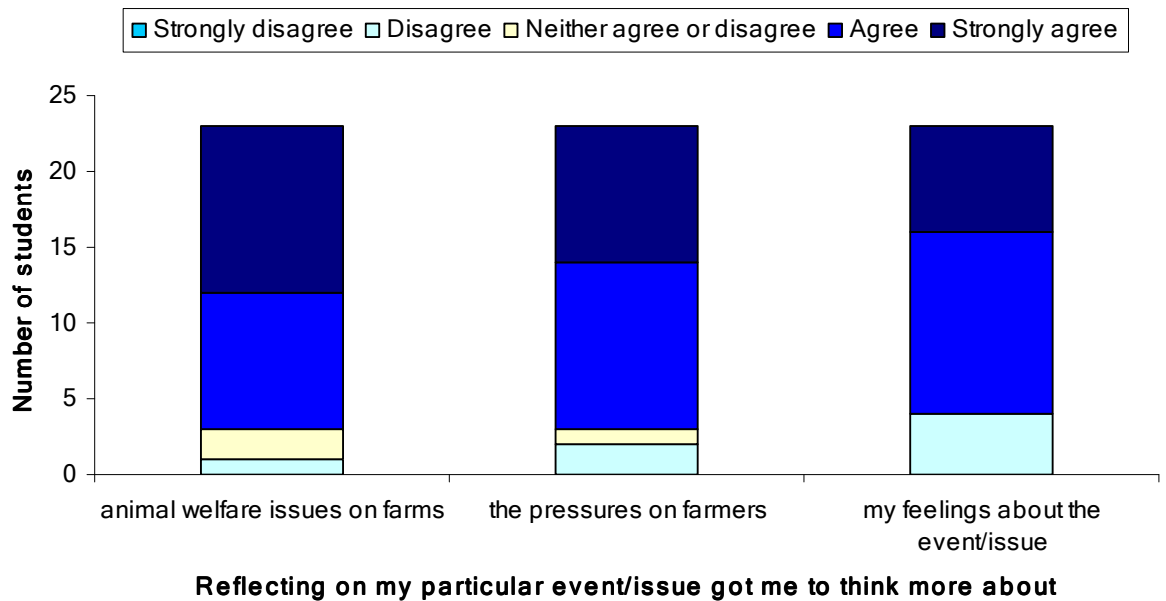
Figure 3.2: Student responses to an online survey asking whether reflecting on an incident that impacted animal welfare prompted them to think more about animal welfare issues, the pressures on farmers and their feelings about the incident

Of the students that completed the feedback survey, 82% felt that it improved their ability to recognise animal welfare issues and to reflect on their experiences at least a moderate amount, and 77% felt it improved their ability to recognise ethical issues and respect others viewpoints to this same degree (Figure 3.3).
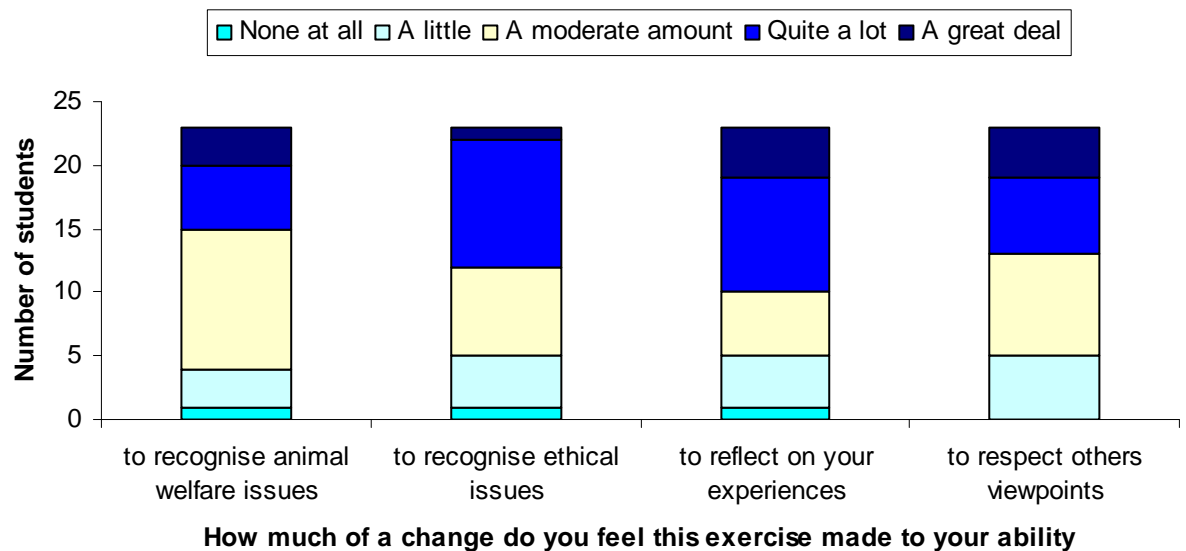
Figure 3.3: Student responses from an online survey asking what effect the AWARE had on their ability to recognise animal welfare and ethical issues, to reflect on their experiences and to respect others viewpoints.

3.4 Discussion

3.4.1 Identifying animal welfare associated incidents on PC-EMS

The purpose of this pilot study was to test the concept of the AWARE, the structure and prompts within it and determine whether first year veterinary students would engage with the exercise. The concept of the AWARE hinged on students identifying suitable incidents relating to animal welfare to reflect on, based on anecdotal reports that students on PC-EMS placements often face ethically challenging situations for the first time. That ethics teaching should be based on ethical dilemmas the students themselves have experienced has previously been supported (Huijer et al., 2000). It was thought that identifying a welfare issue with ethical implications might be a challenge for first year students but they coped well with the self-directed part of the exercise and all students identified suitable incidents. The tool was designed so that students could use it independently of tutor help so it needed to be clear and easily followed. Feedback suggested that this was the case. These findings suggest that minimal guidance is needed for students to recognise ethically relevant welfare issues even at early stages of the course.

As the majority of the AWAREs were completed following lambing, this pilot study also indicates that lambing placements provide a plentiful supply of issues for students to

reflect on. Poor welfare of sheep during EMS visits has previously been reported by veterinary students (Scott et al., 1995). This is not surprising when a large number of animals of low economic value are involved, and at a time when there is a high mortality rate (Binns et al., 2002) coupled with limited veterinary intervention (Scott, 2003). Lambing placements tend to be the first PC-EMS placements that first year veterinary students attend and they are often a revelation to students that have gained most of their animal-based experience working with small animals or horses. This naivety might be expected to evoke strong moral reactions within students. There was some evidence of this, but there was also some evidence of indifference towards incidents that may be construed as negatively affecting sheep welfare.

Lambing placements appeared to be a good source of incidents for which to form the basis of ethical reflection, but identifying an animal welfare related incident will very much depend on the student's experience on PC-EMS and their ability to identify welfare and ethical issues (i.e. their ethical sensitivity). The effectiveness of similar reflective exercises in medicine has been attributed to this with lack of 'salient experiences' being posited as a reason for disengagement with reflection (Driessen et al., 2005). As PC-EMS is so variable (Taylor & Barnes, 1998b) some students may have been exposed to more obvious welfare-related issues than others. In addition, there will be differences in what situations students perceive as ethically problematic or what constitutes a welfare issue. As well as differences in their ethical sensitivity, within groups of students there will also be differences in motivation and the ability to reflect (Driessen et al 2005). Dewey (1910) identified open-mindedness, a sense of responsibility and an ability to consider different sides of an argument as prerequisites for successful reflection. Honesty and motivation have also been given as attributes necessary to maximise learning outcomes from reflection (Richardson & Maltby, 1995). Motivation of veterinary students is likely to be driven by assessment (Raidal & Volet, 2009) so exercises which are not assessed may be seen as having less importance and be perceived as less beneficial. One of the major barriers to motivating students to reflect is that they may not see the outcome of their learning for a long time to come (Harris, 2008).

3.4.2   Structuring the reflection

The structure of the AWARE was based on two components, firstly on a reportable critical incident experienced by the student that related to animal welfare and secondly on Kolb's cycle of experiential learning (1984). Issitt (2003) highlights that it is important for reflections to have a structure and a direction and in this sense, the AWARE has both. Lack of experience has been cited as a barrier to engaging in reflection (Cronin & Connolly, 2007). However, using a structured format and narrowing the focus of the reflection may overcome this barrier (Donaghy & Morss, 2000). The criteria expected in a comprehensive significant event analysis are clearly outlined by Bowie and colleagues (2004). The content requirements are that there is a good description of the incident, that the reflector has sought a clear reason for the incident occurring, insight into the incident is apparent and a change in practice is considered or implemented. With these criteria in mind, judgements were made in relation to the strengths and weaknesses of the AWARE prompts. The structured format seemed to aid engagement in that all students described a suitable incident and showed some level of reflective content, with most also thinking about wider concepts that have implications for action. The structure also appeared to encourage larger pieces of writing in relation to the personal and ethical reflections than for the descriptive account which was a desired result.

Structuring reflection using prompts has previously been found to induce responses akin to active experimentation (Donaghy & Morss, 2007). However, analysis of the AWAREs using Kolb's experiential learning cycle revealed that the current format, in most cases, does not lead to completion of a full reflective cycle. When the prototype was designed, the aim was to increase awareness of ethical issues, and there was no expectation that students would plan future action or change their behaviour. However, considering behaviour change or planning future action is an important aspect of reflection, therefore prompts pertaining to this area were considered for inclusion in the final version of the AWARE.

3.4.3   Individual sections and prompts

When considering the individual sections of the AWARE, the Personal Reflection was expected to be the most difficult part for students. This expectation was confirmed through the focus group discussion, and was evidenced by minimal submitted content relating

directly to emotions and the inclusion of indirect expressions of feelings as thoughts or indifference. There is evidence to suggest that students may feel they have to be, or at least appear to be, unemotional in order to cope with the veterinary course and subsequent work in the profession (Paul & Podberscek, 2000) so this may explain the lack of engagement in this area. Students may not include their true feelings because they are worried about the perception of the person reading it (Boud, 2001) or because they do not want to reveal personal feelings that may expose their own weaknesses (Donaghy & Morss, 2007). In other professions, students have been found to have difficulties in expressing how they felt when they disagreed with their superior (Huijer et al., 2000) and when writing in the first person (Donaghy & Morss, 2007). Personal reflection is likely to be new to many first year students (Kidd & Nestel, 2004) and they may find this new approach to learning difficult, particularly when they are used to a fact-based curriculum (Tate, 2004). The challenge here is to convince students that these novel methods to aid learning can be beneficial.

Although some disagree that feelings form part of critical reflection (Mezirow, 1991), they are most often regarded as an important part of the process (Boud, 2001; Boenink et al., 2004; Tate, 2004). Recognising how one feels about a situation should help in identifying whether one is faced with a moral dilemma or not. Therefore, the inclusion of emotions and feelings was regarded as an important aspect within the AWARE.

In the Ethical Reflection section, the arguments for and against the action were, in the main, well written albeit often brief. The failure of some students to recognise the animal as an affected party was disappointing but more emphasis was put on this in the next part of the study (see section 3.5.1). What became apparent from the responses in this section was that an overwhelming majority of the students supported a utilitarian view. Reflecting the values of others is common in students that have little knowledge and understanding of ethical theory and related concepts (Irwin et al., 1988) and this may be what is happening here. However, utilitarianism is often considered the dominant view within veterinary practice (Fogle & Abrahansom, 1990).

The Round Up section was intended to give students an opportunity to summarise their overall experience of their PC-EMS placement but the prompts elicited very little response from the students. There was indication that standard practices were seen as the norm so that made them justifiable with little questioning of their basis. The incidents witnessed may not have had a significant enough impact on students to alter their perspective or some students may still feel they lack the experience on which to base a perspective.

Furthermore, the closed questions allowed students to answer with a simple 'yes' or 'no'. Prompts were reworded in further trials to facilitate more expansive responses (see Table 3.6).

3.4.4   Student evaluation

Overall, student feedback on the AWARE was positive with the majority of students reporting a perceived improved ability to recognise and reflect on animal welfare and ethical issues, to reflect on their experiences and to respect others viewpoints as well as a heightened awareness of animal welfare issues and the pressures on farmers. Several of these factors relate to the intended learning outcomes. This strengthens the possibility that independent learning approaches such as reflection and self-directed learning could be successful in increasing ethical awareness among veterinary students. Presenting students with the task of identifying the animal welfare related incident likely played a part in the feedback result. In order to identify a suitable incident, students had to consider welfare impacts of actions they witnessed. This, perhaps unsurprisingly, resulted in them thinking more about animal welfare issues. Although these are only perceived improvements, positive feedback has previously been linked to better engagement in a reflective portfolio (Rees & Sheard, 2004).

Encouraging students to learn experientially is increasingly recognised as a powerful learning approach (Shaw et al., 2004) and the feedback showed that all the students liked the self-directed aspect of the exercise and were not daunted by it. Veterinary education has previously been criticised for not employing self-directed learning techniques (Blumberg, 2005). The positive response was a surprising result as new modes of learning have been found to cause anxiety in veterinary students (Howell et al., 2002) and therefore, self-directed learning exercises may meet resistance from students used to teacher-led, didactic approaches. Raidal & Volet (2009) found that regardless of the entry route veterinary students had taken to university (traditional versus alternative) they preferred teacher-led instruction and studying alone. There was also mention of resentment of self-directed learning exercises, mainly because of the heavy workload and the time required to complete them. This was not the experience here but these students were volunteers and more likely to embrace this new form of learning than less motivated students.

Some students reported difficulty in identifying an incident to report on. This may be due to lack of animal welfare related knowledge or species-specific teaching prior to PC-EMS. It also may be related to poor use of the resource section. Providing specific examples of animal welfare issues in species involved in this study may reduce the difficulty. Additions to the accompanying teaching were considered for further trials.

It was hypothesised that a high percentage of students would be apprehensive of being critical because of their respect for authority and a lack of clinical knowledge (Caldicott & Faber-Langendoen, 2005) but this was not the case. Whilst this is encouraging, there is no way of knowing whether students recorded how they truly felt about the actions taken or whether they merely adopted the justifications of others.

The feedback from the focus group indicated that the AWARE was more difficult to complete using an experience involving a positive welfare issue. There was deliberation as to whether negative experiences were more valuable in promoting reflection and that maybe the positive option should be removed. Although it is likely that negative experiences result in deeper reflection and more in depth reporting due to the sensitivity of the concept involved, it was also recognised that it would be important not to focus solely on negative welfare as farmers may feel criticism was being implied. Moreover, positive experiences such as achieving something unexpected or performing a procedure successfully for the first time could easily have a significant emotional impact on a student on which they may want to reflect. It has also been found that some experiences that would be expected to have a negative effect on students can actually have a positive one, e.g. medical students first exposure to cadaver dissection has been found to be a positive experience (O'Carroll et al., 2002).

3.4.5   Procedural challenges

Researchers agree that time has to be given to allow reflection to take place (Boud et al., 1985; Andre, 1992). In this study, the students were allowed two weeks between their experience and completing the AWARE. This period was chosen because it provided time for reflection but meant events would still be reasonably fresh in students' minds. There does not seem to be any agreement on the optimal latency between a situation occurring and reflecting on it but it has been recognised that difficulty with recall can be an issue if the reflection period is too long (Newell, 1992; Jones, 1995). In practice, there was wide

variation in the length of time students took to complete their AWAREs with some not submitting until six weeks after PC-EMS (though it is not known when these reflections were written). As several students gave detailed accounts of their chosen incident it appears that the suggested two week period was appropriate for recall. If an event has a significant impact on a student it is likely to be remembered. However, negative feelings should be resolved sooner rather than later in order to avoid negative effects on future learning (Boud, 2001).

The variation in experience of students entering the first year of veterinary medicine also meant it was difficult to determine the level of complexity at which the exercise and associated teaching should be set. The two largest groups within this student cohort were UK school leavers and North American graduates. The benefit of using a reflective exercise with a group of students with diverse experience is that it is effective at the individual level so more experienced students may reflect to a greater extent but less experienced students can still make positive gains, as long as some structure is provided to guide them (Driessen et al., 2005),.

The results of the moral reasoning tests indicated that the volunteers were no better at moral reasoning than the rest of the student cohort, and in that sense could be considered representative of the wider group. In this pilot study, AWARE did not improve moral reasoning scores but the number of students completing pre and post tests was small, limiting the strength of the statistical comparison.

3.5   Refinement of the AWARE

3.5.1   Modifications as a result of the pilot study and expert review

The expert review culminated in several modifications being made to the AWARE prior to further validation (Table 3.6) (for details of the final version of the AWARE, see Appendix B9). In general, the experts agreed that students should be given the option to reflect on a welfare issue with either a positive or a negative impact. The main alterations were in the Personal Reflection and the Ethical Reflection sections. In the Personal Reflection section, a word-bank of emotions was added after the first prompt relating to how the student felt

about the experience and modifications were made to the prompt relating to why they thought the action was taken so that it overtly stated that students should include their justification as well as the farmers (if it was given). One expert suggested that including a third party's perspective might improve the emotional responses. This idea was not applied in the Personal Reflection section as it was important that students were encouraged to include their personal feelings. However, introducing an element of detachment from the students' own personal views in the Ethical Reflection section was seen as an appropriate means of promoting student engagement with the animal ethics frameworks introduced (see Table 3.6).

Refinement	Reasons
Added examples of common welfare issues to the teaching package and updated the resource section to include Codes of Recommendations for Welfare of Livestock and Codes of Practice for Equidae	Some students found it difficult to identify a welfare issue to report on so examples and further resources were included to help them identify appropriate welfare issues
Added prompt on whether the student thought the issue or event chosen had a negative or positive impact on animal welfare	In the pilot of the AWARE, welfare incidents were categorised by the researcher and was thought more appropriate for students to classify them
A word bank was added to the personal reflection to give students the option of choosing emotions from a list to describe how they felt rather than producing them unprompted	In the pilot, students did not normally convey their emotions and expressed thoughts rather than feelings. Prompting students by providing emotional adjectives may help students report their feelings more concisely, and implies that these feelings are acceptable
The prompt 'Why do you think this action was taken?' had 'include any explicit justifications given by the people/person involved and why YOU thought the action was taken?' added to it	It was often unclear in the trial whether the student was reporting what they thought or what the farmer had told them and re-wording this prompt would distinguish between the two
Added a multiple-choice question asking whether the student was directly involved in the action described. See Appendix B9 for choices given	It became apparent during the pilot that some students were directly involved in the action described. This prompt was added to ascertain how many students were involved in the action taken and of those that were how they felt about it
Added hybrid view to the list of animal ethics frameworks	Focus group indicated that students did not feel they fitted into a box and giving them the option of the hybrid view may encourage them to engage with animal ethics frameworks
Students were asked to convey responses from supporters of each animal ethics framework and what action they might have taken as well as relating their own view to an ethical framework	Personal detachment from the framework was expected to improve engagement. This layout also encouraged consideration of all three frameworks (utilitarian, contractarian & animal rights) rather than only one
Wording of the prompt 'Did you discuss this event/ issue at the time?' was changed to 'Did you share your feelings about this event/issue at the time?'	This was to ascertain whether students discussed their feelings on the issue rather than what had happened
The summing up prompt '**did** this placement… change your perspective …..?' was replaced with an open question - 'please sum up **how** this placement affected you…….?	Using an open question was hoped to prevent students from giving one word answers
Added a prompt on whether they had considered how they might deal with a similar situation in the future	This prompt was not included originally as was deemed too advanced for first year students. However it was included to help encourage students to complete a full reflective cycle

Table 3.6: Refinements to the AWARE and associated teaching following the pilot study and expert review

3.5.2   Creating a computer assisted learning package

In the second year of the project, the small group teaching sessions were replaced with a computer assisted learning (CAL) package. This enabled learning materials to be delivered to a large number of students simultaneously and integration into curricula at other teaching institutions with minimal staff involvement. The less formal atmosphere of a computer class may also encourage students to discuss their views more openly with each other (though they were not actively encouraged to do this).

Glasgow University's Virtual Learning Environment (VLE), Moodle, was used to host the CAL. Narrated lectures were created in Microsoft PowerPoint. Students differ in their preferred learning style (Felder & Silverman, 1988). Therefore, the teaching material used both visual and auditory transfer. The recording was done in the University's media production department and automatic slide transitions were created so that the files played continuous commentary. The teaching package comprised a two part introductory lecture, two worked examples of the AWARE, a downloadable version of the AWARE and two quizzes. The learning materials from the pilot were used with the addition of common species-specific welfare issues. One quiz assessed the students' knowledge on the lecture content and of typical animal welfare issues seen on farms. It also contained an ethically problematic research proposal which was introduced to test ethical sensitivity (see section 4.2.2.3). The second quiz focused on expected learning outcomes of the AWARE. The CAL was provided as supporting teaching material to accompany the AWARE. Previous studies have shown that veterinary students prefer blended learning (Dewhurst & Williams 1998; McLennan, 2003; Dale et al., 2005) rather than replacement of traditional modes of teaching.

3.6   Conclusion

The AWARE, a novel, reflective learning tool designed to promote ethical reflection, was successfully created and piloted with a group of first year veterinary students. This pilot study demonstrated that first year veterinary students were able to reflect on the ethical dimension of an animal welfare associated incident to an acceptable standard, and that in the main, the structure and format of the AWARE worked in practice. However, some prompts elicited stronger responses than others and modifications to the tool were made

following expert evaluation. Overall feedback on the AWARE was positive but the results are based on a small number of student volunteers. No direct measure of the reflective or ethical content was carried out and analysis of this content is required in order to confirm that the AWARE promotes ethical reflection.

Chapter 4 – Validation of the AWARE

4.1   Introduction

4.1.1   Qualitative analysis

Learning tools can be evaluated through feedback questionnaires (Dyson, 2003), structured interviews (Driessen et al., 2005), focus groups (Dale et al., 2011), through tests of ability (for example of a practical skill) before and after the use of the learning tool (Abutarbush et al., 2006) and (if they involve written responses) through direct analysis of the written responses themselves (Pee et al., 2002). Feedback questionnaires provide valuable data on students' opinions of learning tools but do not provide data on the effectiveness of the tool regarding achievement of learning outcomes. By contrast, measuring improvement in ability is a useful technique for ascertaining whether the learning tool has been effective in improving relevant learning skills. These latter two validation methods normally rely on quantitative measures, for example, evaluation through feedback is often based on multiple-choice questions and improvement in ability can be measured through standardised scales of a particular skill, for example moral reasoning as measured by the DIT (Rest et al., 1974). Validation of methods such as structured interviews, focus groups and analysis of written responses is usually based on qualitative data analysis. Although qualitative analysis can provide a rich account of the data, the analysis is time-consuming Due to the time required to administer one-on-one interviews and focus groups, most validation studies involve small groups of students (Henderson et al., 2003; Driessen et al., 2005). Written assignments are more easily administrable to large groups of students and written responses can give a direct indication of the educational value of the tool while allowing individuals to be assessed.

There are various methods of approaching qualitative data analysis of written data including grounded theory (Glaser & Strauss, 1965), thematic analysis (Braun & Clarke, 2006), content analysis (Weber, 1990) and the framework approach (Ritchie & Spencer, 1994). Qualitative analysis techniques are often poorly defined and the methods used are often poorly explained (Braun & Clarke, 2006). The overarching aim of qualitative analysis of written data is to compress large volumes of words into fewer categories. However, the technique chosen is dependent on the specific aim of the analysis.

Approaches can be divided into two categories: 'bottom up' and 'top down'. A 'bottom up' approach is one where the text informs the theory and a 'top down' approach is where theory informs the categories created. A 'top down' process is most often used when testing a specific hypothesis, such as 'why is a new educational practice adopted?' (Miles & Huberman, 1994). 'Bottom up' approaches are commonly used in studies where there is no clear hypothesis for what results will emerge (so called exploratory studies). The investigator reads the data with no expectations as to what content or themes will result. For example, in the original research that gave rise to grounded theory, the researchers investigated the awareness of dying within hospitals with no pre-conceived ideas of what they would find (Glaser & Strauss, 1965). During the analysis research questions may emerge and analysis is done through a circular process of data collection, analysis, development of research questions then possibly more data collection, and analysis and so on (Atwood-Harvey, 2005). Techniques such as thematic analysis and content analysis can be carried out in both ways; themes or categories can emerge from the data (emergent coding) or can be predetermined from theory (Stemler, 2001). In this sense, these methods can have inductive or deductive roots; deductive being when codes are created for a particular, relatively narrow, research question and inductive being when the research question develops during the analysis (Braun & Clarke, 2006). Regardless of which form of coding is used, the reader immerses themselves in the data in order to familiarise themselves with the content and subsequently categorise the data. Data is categorised into themes (or categories) which represent important aspects of the data that are repeated across subjects/sources (Braun & Clarke, 2006). Creation of clearly defined categories is vital in qualitative research so that the results are reliable and the research can be reproduced.

The terms 'thematic analysis' and 'content analysis' are often used interchangeably (Wilkinson, 2000) and the demarcations between them are blurred (Vaismoradi et al., 2013). In its strictest sense, unlike content analysis, thematic analysis does not involve any quantification of the results. The use of numbers in qualitative research is controversial but is supported by several qualitative researchers (Miles & Huberman, 1994; Maxwell, 2010). Maxwell (2010) lists several advantages of the use of numbers in qualitative research including that they contribute to the 'generalisability' of claims; that they help to substantiate results and prevent criticism regarding selective reporting of relevant quotes; and that it is more likely that diversity in data will be identified rather than solely similarities. Disadvantages of quantifying qualitative data are that vital meaning can be lost if context is not taken into account e.g. if simple word frequency counts are used to

represent the presence of a particular word, problems can be encountered with the use of synonyms or with words with multiple meanings (Stemler, 2001).

4.1.2   Measuring reflection

Assessing written reflection is notoriously problematic, as the content is a personal record which is not directly comparable to others (Grant et al. 2007), and because each student's reflection can determine their own learning outcomes (Wallman, 2008). Written reflections also have the added challenge of detecting tone or hesitation and may not be a true representation of reflection (Hatton & Smith, 1995). There is no standard method for assessing levels of reflection (Kember et al., 1999) and one of the main challenges is that there is a scarcity of information in published papers on how to analyse them objectively. Several studies state that they use qualitative analysis but no further detail is given as to how they categorised data (Howell et al., 2002; Kidd & Nestel, 2004; Sibbald, 2004; Jensen et al., 2011; Walther et al., 2007). In these cases the results may still be valid, but it is difficult to reproduce the methods used.

A number of studies where the methods were clearly defined helped to guide the methods for this study. Minasian-Batmanian and colleagues (2006) provide detailed information on their qualitative methodology, which included categorising data using emergent coding, reviewing small numbers of reflections at a time, then refining categories through involved discussions before reviewing more reflections and repeating the process. The authors underline the difficulty in agreeing on the interpretation of qualitative data. Similar methods were described in a study analysing physiotherapy students' reflections as well as content and thematic analysis, and the use of software to create matrices (Donaghy & Morss, 2007).

Two further examples of well-documented validation are reported by Pee and colleagues (2002) and Mori and colleagues (2008). Pee and colleagues (2002) investigated levels of reflection in written assignments by dental hygiene students. The reflection was structured around a significant event and two established frameworks, Johns' framework (1994) and Hatton and Smith's framework (1995), were used to measure the level of reflection observed. In addition, they used peer judgement and student feedback to augment their results. Mori and colleagues (2008) assessed the content of written reflections by

physiotherapy students using a reflection scale previously created by Al-Shehri (1995), along with a standardised test that measured self-directed learning readiness. Using a two-pronged approach of directly assessing the content of the reflections and using a standardised measure of one learning outcome provides an example of comprehensive validation. In both the above examples, the researchers used a combination of qualitative and quantitative approaches to maximise the strength of their validation.

The propensity in scientific research to drive towards quantification has resulted in several studies creating numerical scales to measure levels of reflection. Creating measurement scales is important because without assessment of the levels of reflection its use can become meaningless (Wong et al., 1995). In veterinary medicine, only one paper, which was on a communications exercise, has investigated levels of reflection in a written reflective task (Adams et al., 2006), but the paper did not provide any quantitative results. It refers to the use of self-awareness and critical reflection rather than grading the levels of reflection and no conclusive comments were made on the use of the scheme. Unusually, the paper also reports on a similar study with medical students for which there are quantifiable results given and details of the reflective model used in assessment are provided. Critical examination of this assessment scale, along with four others, is outlined in Table 4.1. This examination was carried out to identify a suitable scale for use in validating levels of reflection present within written reflective reports completed by veterinary students following PC-EMS. Three of the scales considered (Wong et al., 1995; Kember et al., 1999; Kember et al., 2008) were based on reflective models created by other researchers (Boud et al., 1985; Mezirow et al., 1990; Mezirow, 1991). On balance, the decision was made to base the assessment scale for this study on that created by Hatton & Smith (1995). Although Adams and colleagues (2006) provided a scale with similar levels of reflection, its reliability had not been supported by further studies. One of the principle reasons for rejection of assessment schemes based on Mezirow (1991) was because of introspection - feelings or thoughts about oneself – being classified as non-reflective and attending to feelings was considered an important element of the reflective process in the present study (Boud, 2001; Tate, 2004).

Study	Subjects	Coding scheme used to assess written reflective assignments	Critical comments
Hatton & Smith (1995)	60 fourth year bachelor of education students, Australia	Four levels: descriptive writing, descriptive reflection, dialogic reflection and critical reflection. Based on their own investigations of students' writing	Clear descriptions made it easily understood. Scheme allowed for a wide range of reflectivity from none (simple descriptions of events) to writing which incorporated "broader historical, social, and/or political contexts." Hypothesised that these reflection levels would closely relate to type of dialogue present in written reports. Scale follows a linear pattern where students should progress through four stages. Previous use resulted in high inter-rater agreement (Pee et al., 2002) Has been used effectively in other studies (e.g. Pee et al., 2002; Orland-Barak, 2005; Boerboom et al., 2011) and has been adapted into assessment schemes at three UK veterinary schools (Mossop & Senior, 2008; V. Dale, 2010 pers. comm.).
Wong and colleagues (1995)	45 registered nurses studying the 'nurse as an educator', Hong Kong	Based on two reflective models. First, text was coded to one of the six elements of Boud and colleagues (1985) model (attending to feelings, association, integration, validation, appropriation and outcome of reflection), then dependent on the amount of text coded to each of these six categories, students were assigned to a general category of non-reflector, reflector or critical reflector (based on Mezirow et al., 1990).	Based on established models of reflection. Claimed that Mezirow's scale could be used to assess reflection levels reliably and accurately in written reflective journals. General categorisation of reflection (Mezirow et al., 1990) was reliable and easy and using the more detailed codes (Boud et al., 1985) was more difficult and less reliable. Boud and colleagues' codes are not independent and do not occur in a linear fashion. Also said to be 'narrow in application' (Kember et al., 2008). Creation of the categories based on Mezirow et al.'s (1990) work are not clearly explained (in this paper or in the original work).

Study	Subjects	Coding scheme used to assess written reflective assignments	Critical comments
Kember and colleagues (1999)	Undergraduate nursing, occupational therapy, physiotherapy and radiotherapy students, Hong Kong *	Scheme derived from Mezirow's (1991) model which comprised of six levels with two header categories: 'Non-reflective action' (habitual action, thoughtful action and introspection) and 'Reflective action' (content reflection, process reflection and premise reflection). Used these six categories plus an additional category that combined content and process reflection to create seven categories.	Based on well-known work of Mezirow (1991). Specifically aimed to identify a coding scheme for use with students' written reflective journals. Scheme identifies increasing levels of reflection. Showed that the categories could be used to assess reflective thinking levels reliably and accurately from written reflective journals. Has been superseded (see Kember et al., 2008). Mezirow (1991) saw introspection (feelings or thoughts about oneself) as non-reflective.
Adams and colleagues (2006)	85 medical students, Australia	Four levels of reflection: no evidence of reflection, surface reflection, developing reflection and deep reflection. Based on thematic content analysis of students' written assignments by five faculty members.	Easily interpreted scheme (criteria for each stage plainly stated) but paper focused on students' engagement with the reflection rather than suitability of the scale used. Not been corroborated by further studies.
Kember and colleagues (2008)	Radiography students on clinical placements, Hong Kong *	Assessment scheme based on previous work by the same research group (Kember et al., 1999) (so derived from Mezirow, 1991). Condensed to four categories, with habitual action/non-reflection being the lowest, progressing to understanding, reflection and critical reflection respectively.	Felt the previous categories (described in Kember et al., 1999) were "too fine-grained" and that these four codes would be more easily understood for those unfamiliar with reflective theory. Relatively easily understood but in effect only gives two levels of reflection with the lower level, named simply reflection, so not distinct enough for aims of this study. Mezirow (1991) saw introspection (feelings or thoughts about oneself) as non-reflective.

Table 4.1: Synopsis of previously published scales for assessing levels of reflection in written reports

* indicates that the sample size was not provided

4.1.3   Measuring ethical development

Quantitative measures are also important when validating learning tools. Using established measures of intended learning outcomes can strengthen qualitative results. The impact of the AWARE on ethical development was of primary interest, in particular ethical sensitivity and moral reasoning. Measurement of moral reasoning was carried out using the DIT as described in Chapter 2. A number of profession specific measures have been designed to measure ethical sensitivity (Hebert et al., 1992; Byrd, 2007; Borenstein et al., 2008) but none for use in the veterinary profession. The Test for Ethical Sensitivity in Science (TESS) (Clarkeburn, 2002) was considered relevant for this study and could be administered easily on a large scale. Students are presented with a written vignette that outlines an ethically problematic research-based scenario and are asked to list up to five questions that would need to be answered before the research could be approved. During development of the TESS, three test vignettes were piloted and the most successful described a research proposal to produce pharmaceutical milk from cows to aid cystic fibrosis sufferers (scenario originally outlined in Bruce & Bruce, 1998). Moreover, it is a scenario that is relevant to veterinary students. The theory behind using a scenario based test is that students should be able to identify the ethical issues unaided (Weaver, 2007). Unlike some other tests (e.g. Hebert et al., 1992), students are not asked explicitly to list questions concerning ethical issues, rather, the aim is to determine if students will identify ethical issues as most relevant to solving the problem (Clarkeburn, 2002). It was thought, that as ethical sensitivity is the most basic step in ethical development, small changes in ability might be detected that may not be uncovered by the moral reasoning test.

4.1.4   Objectives

This chapter describes a mixed-methods approach to validating the AWARE - four different approaches were used. First, to ascertain whether students could use the tool effectively, a scale was created to assess levels of engagement in relation to the learning objectives (see section 3.1.6). Second, a previously validated reflection scale (Hatton & Smith, 1995) was used to assess the extent to which the AWAREs facilitated critical reflection of PC-EMS.

Third, qualitative data analysis was used to compare the content of two styles of post-EMS report, AWAREs and unstructured reflections. Finally, pre and post AWARE scores on two ethical development tests were compared to investigate whether use of the AWARE improved students' abilities on two components of ethical development, ethical sensitivity and moral reasoning.

It was hypothesised that the AWAREs would elicit higher levels of ethical and critical reflection than the unstructured reflections and that students' ethical sensitivity scores would increase after they had completed an AWARE. The hypothesis was that the unstructured reflections would have a high level of descriptive content. Though relevant, it was hypothesised that moral reasoning score might be less affected because many of the intended learning outcomes of the AWARE related to ethical concepts of animal welfare and reflecting on experiences and were not directly related to moral reasoning (see section 3.1.6).

4.2   Methods

4.2.1   Data collection

Ethical approval for engaging students as data subjects was attained from the Faculty of Veterinary Medicine's Ethics Committee at the University of Glasgow before commencing the study. The unstructured PC-EMS reports and the AWAREs analysed in this chapter were written following PC-EMS placements on sheep farms.

4.2.1.1   AWARE

The entire first year cohort of veterinary undergraduates at Glasgow University 2010/11 (n = 123) were recruited to participate in the study. The students were introduced to the AWARE during their first week of university through a short presentation. On attendance at a two hour,

timetabled session, groups of students completed an ethical reasoning test, the DIT-2 (see Chapter 2) and a CAL introductory teaching resource that accompanies the AWARE (see section 3.5.2). The concept of reflection as a learning method was not overtly explained to students during the introductory sessions. Students were provided with an instruction sheet, which included a statement of consent. Information on gender and age were collected as part of the DIT-2. They were also asked to provide additional demographic information (refer to section 3.2.1.1). Students were asked to complete and return the AWARE within two weeks of their PC-EMS placement by email or on paper. Ongoing tutor support was available throughout this period. There were two rounds of data collection, the beginning of May and the end of September 2011, corresponding to the end of two PC-EMS placement periods. To ensure anonymity, all completed AWAREs were associated with matriculation numbers only. A few students completed more than one AWARE for the same species, and these were labelled with suffixes to distinguish them from each other.

4.2.1.2 Student evaluation

An online feedback survey (Appendix C1) was sent to all students that completed an AWARE. All students that submitted an AWARE were invited by individually addressed email to attend an hour long focus group session. Seven students attended focus groups to discuss the CAL and the AWARE . This involved evaluating each section of the AWARE in terms of student understanding of the topics and difficulties encountered, and the discussion was structured using an interview guide prepared in advance. The discussions were recorded using a digital voice recorder and students gave written consent for the data to be used in this research.

4.2.1.3 Unstructured reflections

Unstructured reflections were recorded as controls. These were sourced from third and fourth year veterinary undergraduates who had completed unstructured reflective commentaries

following their PC-EMS placements. All students in third and fourth year in session 2009-2010 were emailed asking them to submit their unstructured reflective commentaries for PC-EMS. To encourage responses, participating students were entered into a prize draw to win £50 of book tokens. In session 2010-2011, a randomly generated list of 50 students were sent an individual email asking them to submit their unstructured reflective commentaries for PC-EMS, along with the same demographic information collected for the AWAREs. They were informed that replying indicated their consent for the data to be used in a research project and responses were anonymised on receipt. As an incentive, participating students were given 50 print credits.

4.2.2   Quantitative analysis

4.2.2.1 AWARE overview

Descriptive statistical analysis was carried out on the demographic information which are mainly presented as percentages. The AWARE included a number of closed questions (see Appendix B9), which were excluded from the reflection and analysed separately. The answers from the open questions were used in the qualitative analysis and were considered to be the reflection data. Closed questions related to previous farm experience, the duration of the EMS placement, as well as questions specific to the AWARE, such as whether there was a positive or negative impact on animal welfare. Each AWARE was also categorised as reflecting on either an event or an issue. The information from the closed questions was used to allocate attributes to respondents that were then used in subsequent analysis, e.g. the proportion of students that shared their feelings on their chosen incident, or the proportion of students who chose a specific event to reflect on.

In the AWAREs, students were asked to apply three ethical frameworks (utilitarianism, animal rights and contractarianism) to their chosen incident, and to identify the framework that corresponded to their own view (hybrid view was also listed as a choice). The students' answers were reviewed to check whether they had first understood each framework correctly

and second, whether they had applied it in an appropriate way to their scenario. The answers were then placed into four categories: Valid, Partly Valid, Action Only and Not Valid. Valid meant they had addressed the main criteria for that framework; for contractarianism, this was that animals have no moral status and harm to them only matters if it upsets or impacts humans; for animal rights this was that animals have rights, there are things one should never do to animals, and that life should be preserved; and for utilitarianism, this was that the reasoning should be based on the greatest good for the greatest number, it should include a reference to animal welfare, and the level of cost to the animal versus the benefit to human(s) should be weighed up. Partly Valid meant that they had addressed one of the main criteria for that framework, Action Only was when the student stated what they thought the supporter would do but not why, and Not Valid was when they had used arguments not appropriate for the framework in question, e.g. for utilitarian, welfare considerations for the animal were not taken into account.

4.2.2.2 Engagement with the AWARE

In order to assess whether students had engaged with the AWARE, a novel, five-level marking scheme was developed (Table 4.2). This scheme emerged from reviewing the AWARE content in conjunction with the specified learning outcomes (see section 3.1.6). Recurring patterns within the writing became evident, such as the student engaging well with all but one section of the exercise. Similar to other scales designed to evaluate ethical exercises (Boenink et al., 2004; Grant et al., 2007), the highest and lowest levels signalled that all or none of the learning outcomes respectively had been met. Each AWARE was reviewed and allocated a mark on this scale. Rather than looking at answers to particular questions the AWARE was marked as a whole, in an attempt to capture the level of engagement across the exercise. The scores reflected the consistency and depth of reflection throughout the sections. This mark was utilised for validation purposes only and students were not assigned a grade for the AWARE. Ordinal logistic regression was used to investigate any correlations between the level of engagement and the demographic factors collected.

Level of engagement	Score awarded	Description of content
Excellent	5	Deep engagement with the exercise. Detailed answers for each prompt, evidence that student has thought deeply about the issues. Thorough understanding shown. Consideration of the bigger picture and application of principles to the wider world.
Good	4	Above average engagement with the exercise. Detailed answers and good understanding shown. May have missed a minor part out, not applied concepts to bigger picture or the response to one part of the exercise may have been weaker.
Satisfactory	3	Adequate engagement with the exercise. Student answers all prompts in reasonable detail but provides a more limited discussion than levels 4 and 5. May have given a good answer to one section but not to others.
Weak	2	Superficial engagement, lacks abstract thought. No elaboration throughout. May have answered all prompts but superficial grasp of concepts. Particular parts of the exercise answered poorly and others better.
Unsatisfactory	1	Little or no engagement with the exercise. Cursory responses given rather than considering their issue in detail. No depth of thought displayed. Short answers that lack detail, some parts not completed. Failure to grasp concepts, invalid responses to some prompts.

Table 4.2: Marking scheme used to assess levels of engagement with the AWARE

4.2.2.3 Assessing ethical sensitivity

A modified version of the TESS (Clarkeburn, 2002) was used to assess ethical sensitivity before (pre) and after (post) completing the AWARE. The pre-TESS took place in February 2011 before completion of the AWARE and the post-TESS took place between three and eight months after the pre-TESS. The pre-TESS consisted of an ethically problematic research scenario involving the production of pharmaceutical milk from cows to treat cystic fibrosis in humans (Appendix C2). Students were asked to provide up to five questions they thought would need to be answered before granting approval for the research. The post-TESS used a

slightly different scenario that described the breeding of mini pigs for kidney transplants (see Appendix C1, Question 13). The instructions and questions given to the students on the post-TESS were exactly the same as on the pre-TESS.

Students' answers were collated in Microsoft Excel. Answers on both tests were assigned to a sub-category (based loosely on ideas generated in the TESS), which were later grouped into larger heading categories (see Appendix C3). Categorisation was carried out largely to summarise the data and had no bearing on scoring. In the original study of the TESS, if responses were assigned to the scientific category they were considered non-ethical and were awarded a score of zero. However, in the present study many of the responses assigned to the scientific category had ethical aspects to them so these responses could achieve a score of greater than zero. The proportion of answers assigned to each category was calculated. If a student gave duplicate answers, the duplicate was removed and did not count towards a final score.

Each student response was given a score between 0 and 3 adapted from the scoring system used in the TESS (Clarkeburn, 2002). Zero indicated that there was no ethical dimension, 1 that there was general recognition of an ethical issue, 2 that there was a specific ethical issue raised relating to humans or animals and a score of 3 reflected an ethically sound statement that considered the issue from more than one perspective. Each question raised by each student was scored regardless of its category. The maximum score a student could obtain was 15 (maximum 5 responses scored at a maximum of 3 each). If a student only gave 3 responses then the maximum score possible for that student would be 9. No students provided more than five questions. Minitab 16 statistical software (Minitab Inc., USA) was used to carry out statistical analysis on the TESS data. Scores on the pre and post-TESS were collated and compared using a Mann-Whitney U test. Non-parametric tests (Mann-Whitney U and Kruskal-Wallace) were also used to investigate demographic factors.

4.2.2.4 Assessing moral reasoning

The DIT-2 was applied to the entire year group immediately prior to students introductory teaching sessions for the AWARE and then again at the beginning of their second year (after students had submitted AWAREs). Both tests were administered in a classroom situation and the students were given 45 minutes to complete the tests. Students' gender and age were collected as part of the test (other demographic information was collected as part of the AWARE). No formal teaching on ethics took place between the tests. The scoring of the DIT-2 is described in section 2.3.2. Minitab 16 was used to carry out a paired t-test to investigate whether completing the AWARE improved moral reasoning score. Chi-square tests were carried out in SPSS (IBM, USA) to check whether proportions of students allocated to each 'Type' differed having completed the AWARE.

4.2.3   Qualitative analysis

Qualitative analysis was based on a 'top-down' approach. The method used was a combination of what is described in the literature as thematic and content analysis, but for simplicity, will be hereafter referred to as content analysis. Analysis was limited to ethical reflection and codes were created accordingly. Much of the qualitative analysis was quantified because it was felt that this helped to substantiate the claims made and gave a robust account of the content.

Specialist qualitative software, NVivo, (QSR International Pty Ltd, Australia) was used to undertake the qualitative analysis. NVivo allows you to create labels, or nodes, to categorise the text. These nodes represent portions of text; these can be as short as one word or as long as several paragraphs. There are two types of nodes, free nodes and tree nodes. Free nodes are stand alone whereas tree nodes comprise parent and child nodes. Tree nodes allow text to be coded under a broad heading and then subdivided into more detailed headings. Nodes can be quantified as percentage coverage, i.e. the amount of text allocated to a particular node and as a frequency, i.e. a count of a particular node within a source. Frequency searches were used to

record the presence of particular nodes of interest, for example, the occurrence of spontaneous moral reactions (SMRs)[9] in the AWAREs and the reporting of significant events in the unstructured reflections. To ensure accuracy when comparing coverage, all the AWAREs and the unstructured reflections were formatted into identical layouts before importing in to NVivo. All spacing and font sizes had to be the same and the background information on the AWAREs had to be removed. To maintain the structure of the AWAREs, they were uploaded with several prompts in place. Prompts were coded so that they could be removed from the final content coverage readings.

4.2.3.1 Assessing reflection

In order to compare the level of reflection in the unstructured reflections with that in the AWAREs, a comparative scale was devised (Table 4.3). This scale was based on that of Hatton & Smith (1995). In the current study, critical reflection is used to describe the highest level of reflection students were expected to achieve in this exercise (Table 4.3). To validate the scale, the author and an expert in educational research coded five randomly selected unstructured reflections. The coding was then compared and showed good agreement. Some reflections had one or two small instances of high reflective levels but the majority were comprised of another lower level. Therefore, all reflections were scored for both the highest level and the dominant level of reflection.

Using NVivo, a tree node was created called 'Level of Reflection' which had four child nodes representing the four levels of reflection (Table 4.3). The four categories were mutually exclusive. After all sources had been analysed, they were reviewed by the principle researcher to ensure all text was coded appropriately and changes made if necessary. Percentages of each level of reflection, and the counts for the highest levels of reflection, were calculated for the

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[9] A 'spontaneous moral reaction' was defined as a strong emotional reaction that conveyed the student's distaste/unease with the situation and was usually associated with situations in which they considered the action taken to be morally wrong.

AWAREs and the unstructured reflections. Comparisons of the percentages and counts were made using Mann-Whitney U tests as the data did not meet parametric assumptions. Logistic regressions (ordinal and binary) (Minitab 16) were used to examine whether the level of reflection (dominant and highest) was affected by any of the demographic factors collected. Spearman rank tests were used to determine whether there was any relationship between the level of engagement and the levels of reflection in the AWAREs.

Level of reflection	Description	Representative examples from students' written reflections	Source
Descriptive Writing	No evidence of reflection, purely a descriptive account of the situation.	"Triplets were born and soon it was recognised that one wasn't getting enough milk and was therefore becoming weaker than the other two lambs. Another ewe had recently lost her single lamb but still had a good full udder. The decision was made to separate the weakest triplet from its mother and adopt it onto the ewe whose lamb had died. The dead lamb was skinned and the skin put onto the triplet, this 'jacket' was left on for about a week to ensure the new mother accepted the lamb as her own."	A
		"I completed my lambing on a 1300 ewe sheep farm in North Yorkshire. The majority of the sheep were north country mules with a few hundred being texel x north country mules. The ewes were breed to Suffolk or texel rams and were all lambed indoors. The sheep were kept in large groups until they lambed and then were moved into single pens along with their lambs."	U
Descriptive Reflection	Describes personal feelings about the situation. Reflecting on incident on a personal level. Attending to feelings, no deeper consideration, evaluative but based on emotions/initial reactions.	"I felt sad that he had this condition and was suffering but was happy when he was euthanized, it didn't really change my attitudes because I would have taken the same action"	A
		"I was shocked that the farmer hadn't acted quicker to relieve the pain and stress on the ewe."	A
		"Although I wasn't satisfied that the trailer was the culprit I did enjoy the bit of detective work the situation required."	A
Dialogic Reflection	Considers alternatives – could do X, should have done X, potentially could have caused X. Standing back from experience, evidence of discourse with oneself, may consider bigger picture of this particular incident but mainly personal view considered.	"I think the farmer did not really care about how much pain the individual lambs were in and how much distress he was causing to the ewe and the lamb. He was more interested in maximising his profits and weeding out lambs which are of no use to him. The farmer could also have been trying to minimise contact between the ewe and her other lambs and the affected lamb. Prolonged contact could increase the chances of bacterial infection in other lambs too."	A
		"I think that this situation could have been avoided by more frequent checking of the fields and increased indoor housing although this may not be cost effective. The pen arrangement to house the new lambs and mother was very good for bonds to be formed, however, if a lamb was being rejected it could become unsafe."	U

Level of reflection	Description	Representative examples from students' written reflections	Source
Critical Reflection	Standing back from the experience and considering the particular incident in broader contexts e.g. farming as an industry or transfer of knowledge towards future placements. Uses outside influences to support views and explores larger more transferable solutions. Considers issues from different angles at a greater depth than in dialogic. Intention to learn from experience is evident.	"While I believe that animals have moral status which must be preserved, I think that in some cases it is necessary that this is overcome for the greater good. I think that animals have the right to be protected from unnecessary cruelty and suffering and often their treatment and people's attitudes towards them are unjustifiable. However, where a feasible and crucial benefit which cannot be brought about by any other action depends on one which could negatively impact on an animal's welfare, sometimes it is justifiable to carry it out for the purpose of increasing overall welfare for other animals or humans."	A
		"My understanding for the farmers' perspective has truly taken root as I came to realize that farmers are verbal learners. … In rural life, most people learn about new advances and what their neighbours are doing by word of mouth. I found that the vet plays a critical role in this network and without the ability to effectively pass on information, their knowledge is useless. Also, the skill of just having a chat about whatever, is crucial in allowing the farmers to get to know you and gain confidence in you as the person who plays a pivotal role in their livelihood."	U

Table 4.3: Assessment scale used to evaluate the levels of reflection in post-EMS reports

Terminology for levels of reflection taken from Hatton & Smith (1995). A = AWARE, U = Unstructured reflection. Levels of reflection increase in complexity from top to bottom.

4.2.3.2 Coding of ethically relevant reflective nodes

Content analysis was used to identify nodes relevant to ethical reflection. Initial nodes were created to reflect the data using open coding. Nodes were reviewed to ensure they were appropriate and refined if necessary. The prompts in the AWAREs were used to verify the context of the textual response. Sometimes nodes were split into more than one or merged from several into one. Although 34 nodes were generated, on review, several nodes were not relevant so were not examined further and only nodes relevant to the research question will be reported here. In the main, nodes were assigned to full sentences, but sometimes to clauses within sentences if the sentence covered two categories, for example, "Initially I was concerned for the orphaned lambs because often they were quite young or small." would be split into two codes, the first clause (before because) is their emotional reaction and the second clause (after and including because) is why they felt the way they did.

Table 4.4 provides definitions for the 'ethically relevant reflective nodes', which were mutually exclusive. Particular nodes were considered key elements of a good ethical reflection therefore these nodes were used to compare the levels of ethical reflections in the two sources. Ethical reflection requires the presence of emotions, an exploration of feelings, consideration of multiple viewpoints, balancing of different points of view, and evaluation of the action taken. A small amount of descriptive writing is required in order to explain what was experienced but as this is non-reflective no further analysis of this node is included here.

NVivo calculates the percentage of the text covered by each node in each data source. As each AWARE contained prompts as well as reflection data, the percentage of text covered by the prompts was subtracted (from 100%) to give a percentage that represented reflection data only. The percentage coverage for each reflective node was then calculated from this corrected total. This was to allow a fair comparison with the unstructured reflections that contained no prompts. Comparative analysis of the reflective nodes was done using Minitab 16. The data was tested for normality using Anderson-Darling tests and did not meet the criteria for parametric testing. Mann-Whitney U tests were performed on each node to see whether there were any differences in coverage between the AWAREs and the unstructured reflections.

Node	Description
Descriptive writing[N]	Straight-forward description of what happened or what was seen.
Feelings[SK]	Inclusion of feelings using emotions to describe. Not sentences beginning 'I felt' or 'I think'.
Why felt that way[SK]	Reasons given for feelings. Thinking about their reaction in more depth as to what specifically caused the emotion given.
Reflection on action[S]	Evidence of stepping back from the action and reflecting on why things happened.
Evaluation of action[SK]	Evaluation of action taken by someone else. Arguments pertaining to why things happened, backed up by concrete evidence rather than ponderings.
Argument for[SK]	Argument that supports the action taken
Argument against[SK]	Argument that challenges the action taken
Balancing[SK]	Consideration of two sides of an argument and weighing them up against each other
Justification for view	Justification supporting personal view expressed by student on incident described
Change in perspective	A change in views, or attitude towards farming or the practices associated with farming.
Change in behaviour	Proposed behaviour change indicated
Reflection on experience [S]	General node for non-specific reflection, so reflection relating to general experience of placement as a whole rather than specific action. Refers to events that happened not events that might happen in the future. Could contain ethical concepts but also could relate to general experience of placement.
Attendance to other ethical concepts	Content that was not given in a direct answer to an ethical prompt and contains content pertaining to ethical concepts such as rights, fairness, justice (justified) and the use of the word 'should' with reference to actions taken or not taken (only relevant to AWAREs)
Reflection on frameworks	Considering validity of different ethical frameworks in reference to chosen issue
Reflection on treatment of animals	Reflecting on why animals are treated in a particular way and the acceptability of said treatment
Reflection on farming	Considering wider issues of farming such as balancing financial costs against animal welfare
Justification for framework	Support of animal ethics framework chosen in relation to incident reported on. Personal justification (AWAREs only)

Table 4.4: Definitions of ethically relevant nodes

[N] indicates non-reflective node that is required in a reflection to set the scene.
[K] indicates that the node is considered a key element of ethical reflection.
[S] indicates nodes included in statistical comparisons

4.3   Results

4.3.1   Student demographics

One hundred and eight students attended the introductory teaching sessions. Seventy-nine students submitted 81 AWAREs that described an incident involving sheep (73% of those attending)[10]. Over a two year period, 44 students submitted 46 unstructured reflections from first year sheep placements. These students started veterinary school in the years 2006 to 2008, with the majority being in third year when they submitted their reports. The students' demographic information is shown in Table 4.5. There was a wide age range of students in both samples (from 18 to 37).

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[10] 18 students submitted an AWARE describing an incident on an equine placement and 17 AWAREs were submitted (from 15 students) that described an incident on a cattle placement

Variable	AWAREs	Unstructured reflections
Gender		
F	67	35
M	14	11
Age[*]		
18	28	16
19	19	13
20	6	3
21	0	1
22	10	1
23	5	2
24	2	2
25 and over	11	7
Unknown	0	1
Nationality		
North American	21	12
British	52	30
Rest of world	8	3
Unknown	0	1
Upbringing		
Farm	10	13
Rural	29	16
Urban	42	16
Unknown	0	1
Previous degree held		
No	53	33
Yes	28	12
Unknown	0	1

Table 4.5: Demographic information of first year veterinary students that submitted AWAREs or unstructured reflections

* For unstructured reflections, the age presented is the age during the placement.

4.3.2   Overview of the two types of reflective report

4.3.2.1 AWARE

The number of students picking an event or an issue was similar[11]. The majority of students (63%) chose an incident that had a negative impact on welfare whilst 14% stated that their incident had both positive and negative effects on welfare (e.g. a short term negative effect that leads to a long term positive impact). Categorisation of welfare incidents chosen by this student cohort is provided in Appendix C4. The most common incidents chosen related to health, followed by husbandry practices but there were a wide variety of subjects chosen. Examples of commonly chosen incidents were failure to euthanise ill animals or to seek veterinary treatment, lambing difficulties that led to welfare issues, methods of adopting lambs on to new mothers and reusing hypodermic needles. By contrast, timely euthanasia was seen as having a positive welfare impact on several occasions. An example of an unusual, positive event was one where the farmer performed mouth to mouth resuscitation on a lamb. All students picked an incident that impacted welfare but it was questionable from their descriptions in some cases whether they had understood that the situation had ethical implications. This was either due to a lack of detail provided about the situation, making it difficult to work out what the ethical elements were, or there was evidence that the student did not detect the ethical dimension and focused on other aspects.

Eighty-eight percent of students witnessed the incident they wrote about rather than participating in it. Seventy-eight percent of the AWAREs described occurrences that the student had not seen before and 64% of students shared their feelings about the incident with someone, most commonly a fellow student. When asked whether they had considered what they would do if faced with a similar situation in the future, 54% of students said they had. When asked if they agreed with the action taken, 36% of students said 'no, they would have taken a different action' and 31% said 'yes, they would have done the same thing' with 15% responding that they were 'not sure'. The remainder of the students took action themselves (18%). Eleven percent were comfortable with the action they took and 7% were not. Of the students that took the action and did not feel comfortable doing so, they all felt there were negative welfare impacts as a result of their incident. Similarly, all of the students that would have taken a different action listed the welfare impact of their incident

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[11] An event was a specific incident that impacted one or two animals and was an isolated occurrence, e.g. reflection on a difficult lambing. An issue was a more general issue that impacted a group of animals such as the use of adopters.

as negative. Of the students that would have done the same thing, the welfare impact was not so polarised with 48% reporting a positive impact on welfare, 20% stating there were both negative and positive impacts, and 32% reporting a negative welfare impact.

In the AWAREs, all students used at least one emotion from the word bank with 90% picking three emotions as suggested. Of all the emotions indicated, 67% were negative and 29% were positive. The most common emotions chosen in descending order were *concerned, shocked, empathy, helpless, uncomfortable* and *frustrated*. Five percent of the AWAREs, contained the word 'confidence' or 'confident', and only 2% referenced increased confidence. One interesting aspect of the personal reflection in the AWARE was the presence of SMRs. In the AWAREs, 38% of students displayed SMRs and of those students, 81% wrote about something they had seen for the first time and 64% associated a negative welfare impact with the action they witnessed.

Students were asked to choose the animal ethics framework that most closely resembled their view of the incident witnessed. The most popular frameworks were hybrid (47%) and utilitarian (37%), with animal rights and contractarian being chosen by 11% and 5% respectively. Animal rights was the best understood framework of the three outlined in the AWARE based on the validity of responses (Table 4.6).

Animal ethics framework	Criteria required in response	Percentage of student cohort that gave			
		Valid answer	Partly valid answer	Action only	Invalid answer
Utilitarian	Greatest good for greatest number, considers welfare of the animal and cost to animal versus benefit to human/other animals	48	20	6	26
Deontologist	Rules based, animals have rights, things should never do, right to life	69	9	20	2
Contractarian	Only humans matter, animals no moral status, only matters if harming animal upsets humans or impacts humans.	54	16	9	21

Table 4.6: Students' understanding of animal ethics frameworks

4.3.2.2 Unstructured reflections

Although the students were free to write their (unstructured) reflection in their own way, most reports tended to follow a similar pattern, starting off by mentioning their previous experience, followed by some scene setting. There was then often an account of a couple of interesting things that happened on the placement and many rounded up with what they had learned during it. Most students described tasks they completed in the unstructured reflections. For example:

> "While at the farm I got to get some hands-on experience with a variety of different things including lambing (perhaps most obviously), ear tagging, stomach tubing, antibiotic injections, worming, foot trimming, and feeding."

Another example which is written in a more reflective tone:

> "Within the first hour of arriving I was elbow deep in my first lambing. They were triplets and at first it just felt like a big warm mess of tangled body parts. After about ten minutes of sorting I managed to pull out my first lamb. Unfortunately it was dead, and the next one too. The third one I pulled out was actually alive. I felt like I had hardly been there anytime at all and I had already experienced the sadness and glory that is lambing."

Even though the unstructured reflections had a free format, 33% of students reported on a significant event within their reflection. There was little ethical content in the unstructured reflections and there was no mention of ethical frameworks. The unstructured reflections often concentrated on what the student felt they had learnt from the experience and 37% of the unstructured reflections mentioned building 'confidence' or becoming more 'confident'. The emotional content was minimal but instances of feelings such as *enjoyed, interested, shocked, worried, overwhelmed* and phrases that indicated *discomfort* and *uncertainty* were present.

4.3.3 Engagement with the AWARE

The results show that 41% of students had excellent engagement with the AWARE and 15% had good engagement while 30% had satisfactory engagement and 14% did not engage well. There were no relationships between the levels of engagement and the various demographic factors collected. There was a positive correlation between the level of

engagement and both the highest level of reflection and the dominant level of reflection (Spearman rank, $p < 0.001$).

4.3.4   General levels of reflection

4.3.4.1   Highest levels of reflection attained

Of the 46 unstructured reflections analysed, 26% achieved descriptive reflection and 2% provided solely a description of the activities they carried out on placement. Forty-one percent progressed to the level of dialogic reflection, with 30% of students displaying at least one instance of critical reflection (Figure 4.1). Seventeen percent of the unstructured reflections displayed all four levels of reflection, 52% displayed three levels, 28% displayed two levels and 2% displayed one level. Of the 81 students that completed an AWARE, all students achieved dialogic reflection with 58% also reaching the level of critical reflection (Figure 4.1). All the AWAREs displayed descriptive writing, descriptive reflection and dialogic reflection. Students reached higher levels of reflection in the AWAREs than they did in the unstructured reflections (Mann-Whitney U test, $p < 0.001$) with critical reflection being the median highest level for the AWAREs and dialogic reflection being the median highest level in the unstructured reflections.
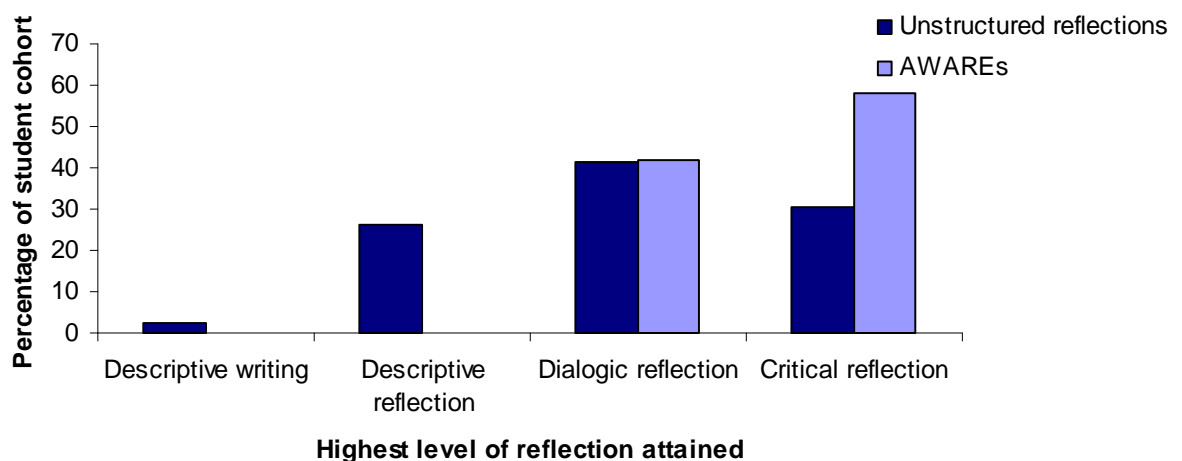
Figure 4.1: Highest level of reflection attained by students completing either the AWARE or an unstructured reflection

In 63% of cases, the dominant level of reflection in the unstructured reflections was descriptive writing, with the next most dominant level being descriptive reflection (24% of cases). Critical and dialogic reflection were the dominant levels of reflection in 11% and 2% of the unstructured reflections respectively. Dialogic reflection was the dominant level of reflection in 69% of the AWAREs, with 17% and 11% of the completed AWAREs predominantly displaying descriptive and critical reflection respectively. Descriptive writing was predominant in 2% of the AWAREs. The unstructured reflections had a higher median percentage of descriptive writing than the AWAREs ($p < 0.0001$), whereas the AWAREs had higher median percentage contents of dialogic ($p < 0.0001$) and critical reflection ($p < 0.001$) (Figure 4.2). The levels of descriptive reflection were similar in both sources ($p = 0.08$). No differences were seen in the levels of reflection between male and female students, those with or without a degree, or students of different ages, nationalities or upbringing (rural/urban/farm).
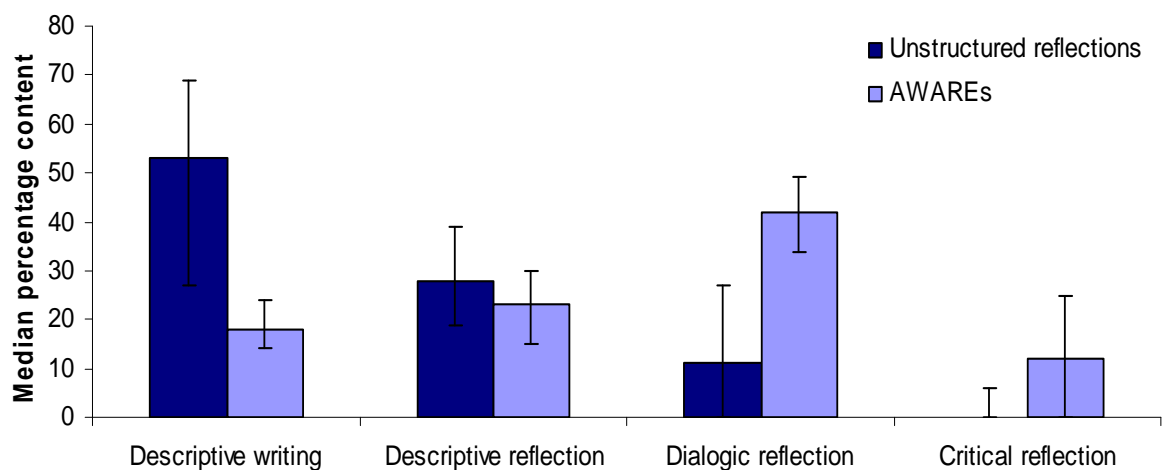
Figure 4.2: Median percentage content of each level of reflection in structured (AWAREs) and unstructured post-EMS reports

4.3.5   Ethically relevant nodes

Qualitative analysis confirmed that the unstructured reflections had a greater percentage of 'reflection on experience' ($p = 0.01$) than the AWAREs. The AWAREs had a greater percentage coded to 'feelings' ($p < 0.001$), 'why one felt that way' ($p < 0.001$), 'argument

for' (p < 0.001), 'argument against' (p < 0.001) and 'balancing' (p < 0.001) (Figure 4.5). There were no differences between the two sources on 'reflection on action' and 'evaluation of action'. The medians of all other reflective nodes listed in Table 4.4 were zero so these nodes could not be compared statistically. In general, text coded to 'ethically relevant reflective nodes' was higher in the AWAREs with a median of 52.8% compared to 20.6% in the unstructured reflections (p < 0.001). Several of the reflective nodes had medians of zero in the unstructured reflections indicating that little to no ethical reflection was taking place prior to the implementation of the AWARE (Figure 4.3).
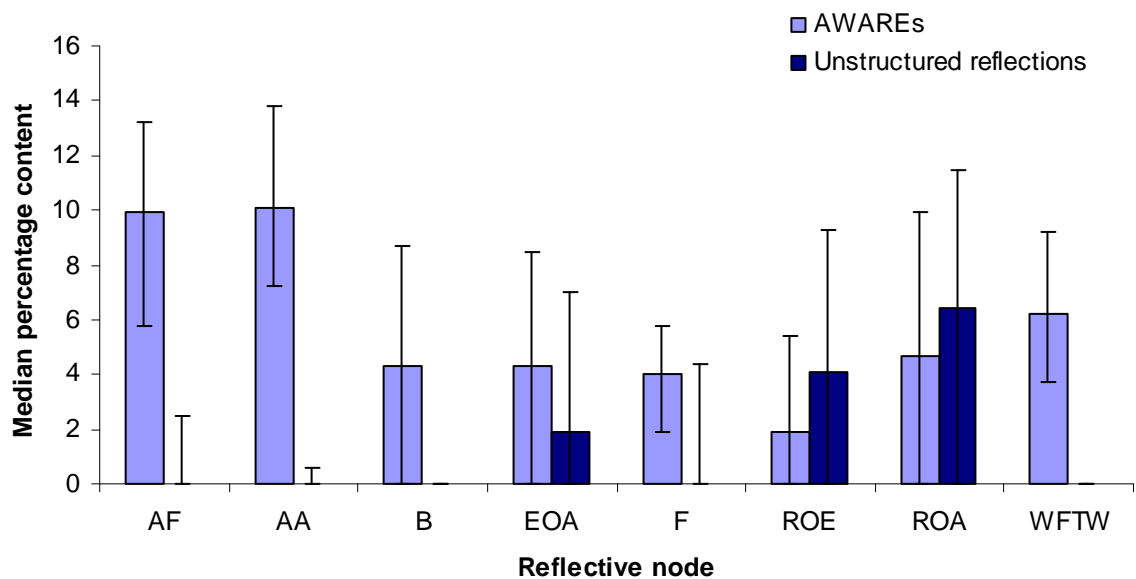
Figure 4.3: Median percentage content of ethically relevant reflective nodes in two types of written reflection

AF = arguments for, AA = arguments against, B = balancing, EOA = evaluation of action, F = feelings, ROE = reflection on experience, ROA = reflection on action, WTFW = why felt that way.

Looking at the key elements of ethical reflection in particular, 9% of the unstructured reflections contained none of these elements; 11% contained an argument for and against an action and 0% contained all six key elements of ethical reflection (Table 4.7). On the other hand, all the AWAREs had arguments for and against an action and 43% of them displayed all of the key elements of ethical reflection. The node 'feelings' was present in all of the AWAREs whereas 52% of the unstructured reflections had no mention of feelings. In the AWARE, 98% of the students gave reasons for their feelings (why they felt that way) whereas 15% of the unstructured reflections contained content coded to this node.

Source	All key elements	Arguments for and against	Feelings	Why felt that way	No key elements
AWARE	43	41	100	98	0
Unstructured reflections	0	11	48	15	9

Table 4.7: Percentage of the AWAREs and the unstructured reflections containing various key elements of ethical reflection

Key elements of ethical reflection are represented by the following nodes: feelings, why felt that way, evaluation of action, argument for, argument against and balancing.

4.3.6   Ethical sensitivity

Before placement (pre-TESS), the ethical sensitivity measure was attempted by 97 students. Sixty nine percent of students listed five questions about the scenario on the pre-TESS. This dropped to 50% after placement (post-TESS), where 40 students completed the TESS. All students identified at least one ethical issue in their answers, with the minimum score being one in both tests (minimum possible score was 0). The maximum score on the pre-TESS was 12 and on the post-TESS was 13 (maximum possible score was 15). There was no significant difference between the pre and post-TESS median scores overall (Mann-Whitney U test, $p = 0.29$, pre-TESS median = 6, post-TESS median = 5.5). For those students that completed both the pre and post-TESS ($n = 31$), there was no difference between the pre and post-TESS scores (Wilcoxon signed rank test, $p = 0.06$, median pre-TESS = 7, median post-TESS = 6). No differences were seen on the pre-TESS scores between males and females or between students with rural, urban or farm upbringings. Students holding a degree had a significantly lower score than those without (Mann-Whitney U, $p = 0.009$). A significant difference was found in the pre-TESS scores with age. The 19 year olds scored highest and students aged 23 and over scored lowest (Kruskal-Wallis, $p = 0.04$). No significant differences were found between any of the above factors on the post-TESS data. The groups in nationality and age were too small to test reliably and the small number of males in the sample also made it difficult to test gender.

The patterns of categorisation were very similar on pre and post-TESSs. Students most often gave a question relating to animal welfare on both tests (Table 4.8) but scientific questions also featured prominently.

	Percentage of students	
Response	**Pre-TESS**	**Post-TESS**
Scientific	84	90
Ethical	55	68
Animal welfare	96	92
Human effects	26	12

Table 4.8: Percentage of students who provided at least one response in the given categories on the pre and post-TESSs

4.3.7   Moral reasoning

The results of the pre-DIT for this cohort of students (cohort 2) are described in Chapter 2. Of the students that completed both a pre and post-DIT (n = 78), 68 also completed an AWARE. The mean P score on the post-DIT for these students was 35.6 (± 1.6) and the mean N2 score was 35.6 (± 1.6) (Figure 4.4). No differences were found between gender, upbringing, degree held, age group, or whether the student's first language was English on post P and N2 scores in cohort 2, or for 'change in P score' or 'change in N2 score'.
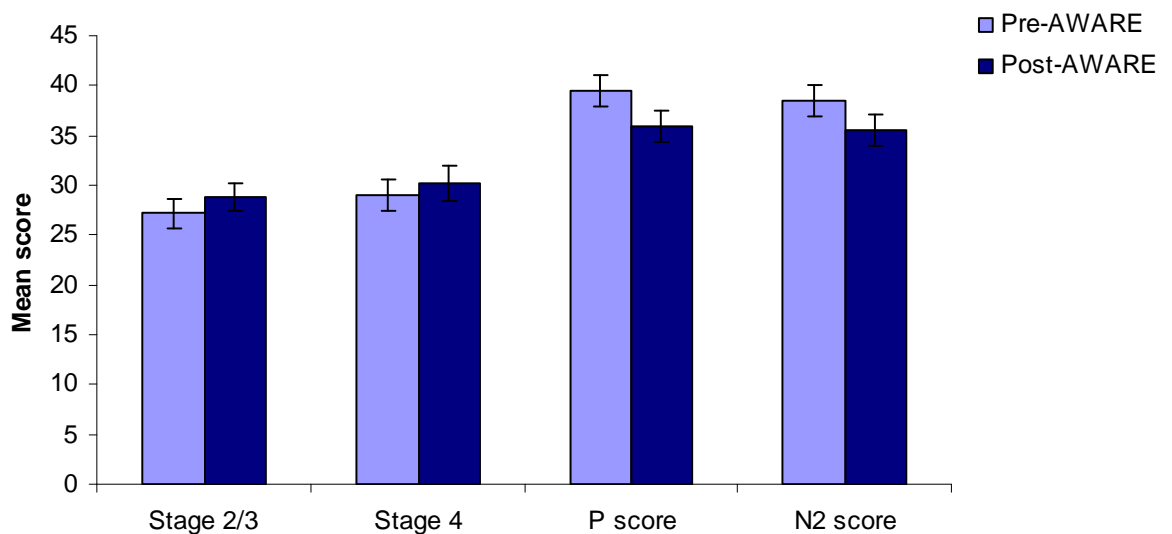
Figure 4.4: Pre and post mean DIT scores for first year students who completed an AWARE

Of the students that completed an AWARE, 22% were allocated Type 7 and Type 6 on the post-DIT, and 19% allocated Type 2. Overall, 44% relied on post-conventional moral reasoning, 31% on conventional level moral reasoning and 22% on pre-conventional moral reasoning (Figure 4.5). On this post-DIT, 59% displayed a transitional profile and 38% a consolidated one which is similar to the pattern seen on the pre-DIT for this cohort (chi-square test). However, this is in contrast to the result of the post-DIT for cohort 1 where 63% of students were seen to have a consolidated profile and 37% a transitional one. In addition, the percentage of students with 4 or 5 'can't decides' tripled from pre to post-DIT in cohort 2, from 7% on pre-DIT to 25% on post-DIT.

Pre-AWARE   **Post-AWARE**
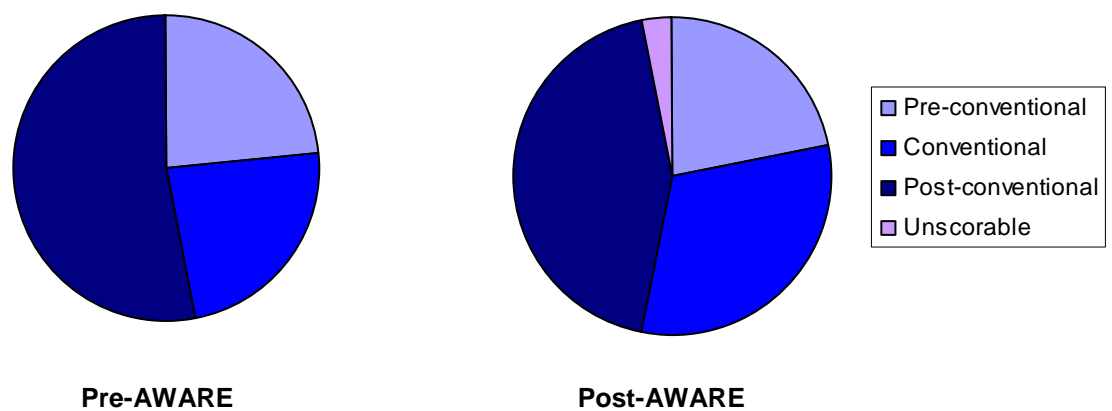
Figure 4.5: Levels of moral reasoning that are predominant in first year veterinary students who completed an AWARE

The post-AWARE P and N2 scores were lower than the pre-AWARE scores (paired t-test, n = 68; P score p = 0.029; N2 score p = 0.022). However, this was also the case for the whole group regardless of whether they completed the AWARE or not (paired t-test, n = 77, P score p = 0.019; N2 score p = 0.013). Furthermore, irrespective of whether students completed an AWARE or not, the mean change variables (change in P and change in N2 scores) for cohort 2 were negative whereas in cohort 1 (first year students pilot study) they were positive.

4.3.8   Student evaluation of the AWARE

Forty students completed the online feedback survey (35 females and 5 males) (response rate of 41%). Ages of the students ranged from 18 to 38, and 13 students already held a degree. In response to question 10 (Appendix C1), 92% of students reported that completing the AWARE helped them 'a moderate amount' or more ('quite a lot' and 'a great deal') towards meeting the learning objective 'to encourage you to reflect on your experiences and record them concisely'. With regards to the introductory teaching session, 80% of students found the CAL easy to follow, with none disagreeing. Worked examples were especially useful to 70% of students. Forty percent favoured the computer based format compared to 28% opting for a traditional lecture based format. The majority of students (65%) recognised the benefit of open access to the CAL at their convenience.

The majority of students liked the self-directed part of the exercise (82%). The small percentage of students that did not like the self-directed part of the exercise, also reported having difficulty identifying an issue, difficulty in completing the AWARE, were apprehensive of writing negative comments about other's actions and felt uncomfortable including their personal feelings in the AWARE. The majority of students found it difficult to identify a welfare issue to reflect on (62%) and of these, 76% were non-degree holders compared to 24% of degree holders. However, only 20% of students referred to the resource section that included the farm animal welfare codes to help them identify a suitable welfare issue to reflect on. The majority of students were also apprehensive of writing negative comments about the action of others (60%), and similarly 83% of these students were non-degree holders compared to 17% of degree holders. A smaller number of students (30%) were uncomfortable including their personal feelings in a reflective piece of writing.

After completing the AWARE, 70% of students perceived that their awareness of animal welfare issues on farms, and of their own feelings about the incident, had improved, and 80% of them felt their awareness of the pressures on farmers had improved. The majority of students felt better able to recognise animal welfare issues (70%), recognise ethical issues (65%), reflect on their experiences (78%) and respect others viewpoints (80%) as a result of completing the AWARE.

Although focus groups were organised, the number of students attending was small (n = 7) and the data collected was not thought to be representative of the student cohort so the findings are not included here.

4.4   Discussion

4.4.1   General findings

The AWAREs were found to elicit higher levels of ethical reflection than the unstructured reflections. The unstructured reflections showed almost no evidence of ethical reflection, and the levels of general reflection present were consistently lower than those displayed in the AWAREs. Disappointingly, the AWARE was not found to have a positive impact on moral reasoning score or on ethical sensitivity score. Nevertheless, the content analysis does support the notion that the AWARE improves ethical awareness. Feedback from the students was positive and indicated that the AWARE had achieved several of the intended learning outcomes. It would have been interesting to have asked students that completed the unstructured reflections whether they felt completing that reflection helped them towards achieving similar learning outcomes.

The structured format of the AWARE is likely to have greatly contributed to improving the ethical content as did focusing the reflection on an animal welfare issue. The prompts in the AWARE subtly guide the student, encouraging them to stand back from the incident and consider different aspects of their experience including other points of view. This does not consistently take place in the unstructured reflection or without prompting. For many of these students, completing post PC-EMS reflections will be the first time they have been asked to reflect. Providing additional support in the form of prompts has been cited as a way of making reflection more accessible to novices (Grant et al., 2007). The lack of guidance in the unstructured reflections resulted in diary-like responses with high descriptive content and fewer elements of ethical reflection. Additionally, the use of animal welfare and ethics as the focus of the AWARE likely played a significant role in increasing the levels of reflection. Issitt (2003) states that failing to provide direction in reflective activities can be unproductive, and reflective journals, which normally lack structure, largely facilitate lower levels of reflection (Richardson & Maltby, 1995). If students are not given a focus for their reflective exercise, as in the unstructured reflections, they do not

tend to focus on a specific incident so reflection tends to be displayed from a single perspective which results in descriptive reflection being achieved but rarely higher levels (Orland-Barak, 2005). The resolution of ethical dilemmas often requires consideration of alternative viewpoints which may lead to a form of internal discourse, so in this sense ethically controversial situations are ideal for creating a reflective tool. The use of animal welfare and ethics as a focus for reflection may have heightened students' awareness of their responsibilities towards animals and as a result contributed to more in-depth reflections.

4.4.2   Use of significant event analysis

It was more common for students to choose to reflect on situations that had a negative impact on animal welfare compared to positive ones. Negative incidents may simply be more frequent than positive ones, more easily identified by inexperienced students, or it could be that incidents with positive welfare consequences may have less of a lasting emotional impact on the student than those with negative impacts on animal welfare. Negative impacts are more likely to arouse spontaneous moral reactions (Ohman & Ostman, 2008) and may therefore be more memorable than positive issues. Similarly, medical errors that resulted in a poor outcome were more likely to be remembered by students than those where there were no negative consequences (Fischer et al., 2006).

The results show that more students who picked an event showed critical reflection than those that picked an issue, but more students (19%) that picked an issue displayed critical reflection as their most common level in comparison to those that picked an event (4%). This indicates that choosing an event does not prohibit critical reflection but choosing an issue may make it easier to expand critical content.

As mentioned in Chapter 3, the success of the AWARE in eliciting ethical reflection may be dependent on the incident chosen for discussion. If the incident is inconsequential then there may not be much the student can say to elaborate on it (Driessen et al., 2005). The incident chosen is also very much dependent on the student's individual experience on PC-EMS. For optimal tool use, students need to be equipped with information and skills to identify animal welfare issues on farms. This is one of the biggest challenges of using the AWARE. The majority of students found it difficult to identify an incident to report on,

and of these, most were non-degree holders. This is perhaps unsurprising as non-degree holders will have less experience of self-directed learning and may also have poorer knowledge of welfare issues. That implementing self-directed learning methods such as PBL in veterinary curricula is more difficult in the UK than in the USA (where students are graduates on entering veterinary courses) has previously been highlighted (Lane, 2008). Interestingly, despite reporting difficulty choosing relevant animal welfare associated incidents, most students did not use the resource section provided to help them. It is possible that students may be focusing on unusual occurrences rather than considering husbandry practices commonly associated with impacting animal welfare such as housing or breeding (these are two areas where guidance is offered within the animal welfare codes (DEFRA, 2000; SEERAD, 2002) but were not mentioned by any students). Incorporating the AWARE into a joint teaching package that also aims to improve students' abilities to assess animal welfare through behavioural measures could help to reduce these difficulties. Student attitudes towards this form of learning also play a part, as students that did not like the self-directed part of the exercise (as reported through the feedback questionnaire) were also found to have a negative attitude towards other pertinent aspects of reflection (e.g. making critical comments, including personal feelings) as well as struggling to identify an incident on which to report. Students encountering difficulties may benefit from additional support including explanations of the benefits and aims of the exercise and personalised feedback. Feedback was not given to students following completion of the AWARE (because the tool was being validated). Bebeau (1993) saw improvements in students' abilities to develop well-reasoned arguments on ethical assignments when feedback was given after their completion and individualised feedback has been used successfully to improve moral reasoning scores when adapted to the performance of the student on a reflective assignment, i.e. students that scored lower were provided with different feedback than those that scored higher (Reiman & Thies-Sprinthall, 1993). This should be considered in the future when incorporating the AWARE into veterinary courses.

4.4.3 Engagement

Students successfully engaged with the AWARE with 86% achieving a satisfactory rating or higher. The results suggest that first year veterinary students are willing and able to engage with a reflective exercise focusing on ethics. The level of engagement correlated with the level of reflection, indicating that the engagement scale reflects the likelihood of

achieving the intended learning outcomes. Students that did not engage well with the exercise tended to give little detail on the situation encountered. This made it more difficult for the assessor to interpret the significance of the issue and often the lack of elaboration meant it was difficult to decide whether arguments or justifications were valid. In general, analysis of written assignments can be difficult because tones or underlying meanings are more difficult to uncover than in transcribed text (Raidal & Volet, 2009).

Assessing the level of engagement has not been done in many studies of reflection, and in particular in ethical assignments. Only one example (in dentistry) was found of an assessment scheme for a written ethics assignment. Bebeau (1993) created a scheme where points were assigned for ethical content including identifying ethical issues and affected parties, describing potential consequences of actions, applying moral principles in relation to professional duties and showing openness to change their perspective. No empirical data on its use were provided, and the ethical assignment was used as the measure of success of ethics tuition rather than as the intervention itself (as the AWARE is). The engagement scale created for the AWARE was based on the presence or absence of similar ethical content, and although not assigned individual points, the level of engagement directly related to how fully and how many of the learning outcomes were met.

The AWARE engagement scale was designed to be translatable into grades if required, with benchmarks for each level/grade clearly defined, similar to an assignment grade descriptor used in University marking schemes. Assigning grades in this way is supported by Kember and colleagues (2008) and it is hoped that faculty members will be able to assess the levels of engagement with the AWARE without special ethical training. Similar investigations of reflective work have shown that peer judges are able to assess reflections consistently with little guidance (Pee et al., 2002).

The ability to engage with the exercise did not appear to be dependent on particular demographic factors as students of different ages, nationalities, upbringing, educational level and gender achieved critical reflection. This suggests that the AWARE as a self-directed learning tool for improving veterinary students' ethical awareness could have widespread application within veterinary courses. As well as promoting ethical reflection, practical advantages of the AWARE are that it requires minimal supervision, can easily be marked using the scoring system developed and it gives students the opportunity to develop independent learning skills. The results of the content analysis indicate that good

levels of reflection can be reached even in a shorter piece of writing, and this is highly desirable to university staff for assessment purposes and students alike.

4.4.4   General levels of reflection

The variety of sections in the AWARE facilitate different levels of reflection. In general, the account of the animal welfare associated incident is expected to be mainly descriptive writing, with the potential for descriptive reflection. The personal reflection section is expected to be principally descriptive reflection, and may support dialogic reflection dependent on how the individual student engages. By giving arguments for and against actions in the ethical reflection part, students have to think in an abstract way, which results in largely dialogic reflection. However, there is the opportunity for critical reflection if the student considers their incident in more depth. The final section adds to the opportunity for critical reflection as it asks the student to reflect on the experience as a whole and how it may have changed their perspective or their behaviour, but again this section may only elicit dialogic or descriptive reflection depending on student engagement.

Students relied less on descriptive writing in the AWAREs than in the unstructured reflections. The lack of structure, coupled with inexperience, resulted in students struggling to achieve the objectives of the exercise (a similar point was raised by Driessen et al., 2005) and treating the reflection as a diary of what they did on placement. Another possible influence on the content of unstructured reflections are that institutional attitudes influence the depth of what students are willing to reveal in their portfolios and encourage conservative accounts of experiences (Orland-Barak, 2005). Students do not want to reveal weaknesses in their ability or understanding (Boud, 2001) and may choose to omit references to situations in which they had difficulty, unless specifically prompted to include them.

Descriptive reflection was predominant in the unstructured reflections and was present in all of the AWAREs. The similar levels of content covered by descriptive reflection in the two sources are likely to be because students are able to attain this level of reflection with little guidance (Richardson & Maltby, 1995). Descriptive reflection is often the predominant level displayed in reflective assignments with little structure (Hatton & Smith, 1995; Orlandbarak, 2005). The levels of reflection attained through the AWARE are higher than those seen in other studies and, considering this study was carried out with first year

undergraduates, are higher than expected. First year students are not expected to relate their experiences to the broader features of their profession (Mori et al., 2008) as is characteristic of dialogic and critical reflection. In a study on medical students, the aim was for students to have achieved 'developing reflection' (a level akin to dialogic reflection) by the end of third year (Adams et al., 2006). The study found that 61% of third year medical students predominantly showed developing reflection whereas 69% of the first year students completing the AWARE predominantly showed dialogic reflection. However, Adams and colleagues (2006) did acknowledge that the structure of their exercise did not lend itself well to more advanced levels of reflection. Prompting consideration of alternate viewpoints is the main contributor to the predominance of dialogic reflection (discourse with oneself about possible reasons for actions) within the AWAREs. Moreover, it should be noted that the population used in this study were heterogeneous, with some already holding primary degrees and this may have contributed to heightened levels of reflection.

The majority of students completing the AWARE achieved critical reflection (58%). This ability is important for ensuring students can cope in professionally demanding situations (Donaghy & Morss, 2007) and that they are able to challenge existing practices (Clouder, 2000). In similar studies, none or small proportions of students achieved this level of reflection (Hatton & Smith, 1995; Wong et al., 1995; Orland-Barak, 2005; Mori et al., 2008), though the term critical reflection may not be directly transferable. A number of these studies involved reflective exercises where little structural guidance was offered and the topic for reflection was relatively wide with none pertaining specifically to ethical issues. Descriptions of critical reflection often include moral and ethical considerations (Hatton & Smith, 1995) so in that sense including an ethical dimension to the reflective topic may have had a strong influence on the levels of reflection achieved.

There was no obvious correlation between ability to reflect critically and the demographic information provided. Students differ markedly in their experiences and ability and this will impact their skill when it comes to reflecting critically. Identifying what the characteristics or attributes of students are that make them good at reflecting will help to progress the use of reflection in professional schools. All veterinary students are highly capable and highly motivated (Zenner et al., 2005), but differences in personality (Pompe, 2005b), personal beliefs (Bebeau, 1993), willingness to engage with new styles of learning (Self, 1988), previous experience, and the student's ability to communicate effectively through writing (Driessen et al., 2005) may all influence their reflective capacity. Also of similar interest, are influences causing students to fail to engage with reflection. It could be

that they are accustomed to rote learning (Raidal & Volet, 2009) and have little experience of using independent thought, or it may be that socio-economic background plays a role (Hatton & Smith, 1995).

Assessment of reflection in this study was done using a two-pronged approach, considering the highest level attained as well as the dominant level displayed. Although it is important to know what level students can attain, the highest level may make up a small percentage of the total reflection and may not give a comprehensive view of the student's ability. Hence, the dominant level of reflection was considered to be more representative of ability in relation to achieving the intended learning outcomes. The scale chosen to assess the reflections was sufficient to allow different levels of reflection to be identified. As with the engagement scale, the reflection assessment scale could be adopted into marking schemes for post PC-EMS reports.

4.4.5   Ethically relevant content

Of the six nodes identified as key elements of ethical reflection (feelings, why felt that way, evaluation of action, arguments for, arguments against and balancing), five had higher percentage coverage in the AWAREs compared to the unstructured reflections, with the content coded to 'evaluation of action' being similar in the two formats. Although more content pertaining to 'feelings' was present in the AWAREs compared to the unstructured reflections, the percentage coverage was low (4%). Encouraging students to include personal feelings in reflections is not easy (Henderson et al., 2003). In the unstructured reflections, feelings were often mentioned in the context of what students were taking away from the experience rather than what they felt when they were on farm. These feelings could be termed 'reflective feelings' and an example would be 'I felt more confident lambing'. This reluctance or inability to openly use emotive words was reported in another study (Adams et al., 2006) where a third of medical students who completed a written reflection (following simulated patient interviews to test their communication skills) recounted thoughts rather than feelings. Allowing students to select emotions from a word bank helped to elicit emotional content but most students did not take the option of expanding on their feelings once they had chosen words from the word bank. This may be because selecting from the word bank is seen as completing this section but may also be because students are not used to expressing feelings openly in written work (Donaghy & Morss, 2007).

Similarly, SMRs were not displayed as often as might have been expected in the AWAREs (38%). It was hypothesised that centring the AWARE on incidents that impacted animal welfare was likely to elicit strong emotional and moral reactions from students. Of those students that did display SMRs, the majority were caused by situations the student was experiencing for the first time and that had negative impacts on welfare. This is as expected as increased exposure (desensitisation) will lessen the resulting emotional reaction (Charlton et al., 1994; Druglitro, 2006), while naivety is likely to heighten it, and SMRs are most often associated with unethical behaviour and therefore, actions with negative welfare impacts. The reason for this low incidence was not investigated further so the author can only speculate that this might have been for several reasons: the majority of first year veterinary students are not impacted by animal welfare incidents to the extent that they create a strong emotional reaction (they have been desensitised or do not find them distressing); the PC-EMS experience did not provide instances of animal welfare incidents of sufficient significance to elicit strong emotional reactions; students lack the ability to articulate their feelings even if they do have a strong emotional reaction; they do not recall their reaction clearly enough (poor/unclear memory of event); or there is also the possibility that students are not being honest in their accounts (Tate, 2004). It has been said that emotional discomfort is necessary to progress to the next stage of reflection (Boyd & Fales, 1983). This was not the case for students completing the AWARE as many of them achieved advanced levels of reflection without displaying much emotion. It is possible that the structured prompts that encourage students to consider different sides of an ethical issue are as effective in helping students progress to higher levels of reflection as experiencing negative emotional effects.

Students' expressions of 'why they felt that way' were higher in the AWAREs than in the unstructured reflections. Thus, progressing to reflecting on the ethical basis of their feelings seems to require extra prompting. Sharing feelings can help students progress to more advanced levels of reflection (Boud, 2001; Donaghy & Morss, 2007). Anecdotal reports suggest that veterinary students often return from PC-EMS and discuss their experiences, especially when they have had an emotional impact. The AWAREs support this, with the majority of students stating that they shared their feelings about their chosen incident with someone else. This was very often a fellow student, and it became apparent through reading of the AWAREs that many veterinary students attend PC-EMS in pairs and it was most often this fellow veterinary student that served as a confidante in difficult situations. The importance of peer support during veterinary education has been highlighted by Usherwood (2011). Students may share with fellow students because they

feel more at ease showing vulnerability to their friends than to members of staff for example (Thurman et al., 2009). Reflecting through discourse with another can have several advantages in that it provides an alternative perspective, students may feel supported (Tate, 2004) and environments in which students feel safe promote reflection (Wald et al., 2009). Another person may also provide rationality to an emotive position (Tate, 2004). This high propensity for sharing their traumatic or surprising experiences may have contributed to the high levels of reflection observed by helping to clarify students' thoughts before they committed them to paper.

'Evaluation of action' was the only node considered a key element of ethical reflection that was not higher in the AWAREs than in the unstructured reflections. It was not a node that represented much coverage in either format of reflection. Evaluating the action required the student to use evidence based reasoning to support their view on the action. Most students tended to give musings or thoughts on the action instead ('reflection on action'). This may be because many of the students lack knowledge of the concepts behind husbandry procedures or welfare codes, or the economic basis of farming, or that they have never considered these issues at a deeper level. This may improve with their experience on farms. As it is an area that is closely linked to ethical reasoning (Rest et al., 1974), it is important to try to develop the concept of evaluating others actions in veterinary students.

The nodes of 'arguments for', 'arguments against' and 'balancing' combined can be considered analogous to ethical reasoning. These three nodes all represented more content in the AWAREs than in the unstructured reflections, where their presence was almost non-existent. The presence of these nodes suggest that, with guidance, first year veterinary students are capable of producing elements of moral reasoning, though which Kohlbergian stage they represented was not investigated. Introducing opportunities to practise basic moral reasoning at an early stage in the veterinary course is likely to be beneficial for clinical care at a later stage.

Ethical frameworks are useful aids for decision-making in veterinary practice (Mullan & Main, 2001) and being able to apply them to real-life situations was considered an important learning objective. In order to improve students' understanding of the basis of common animal ethics frameworks, as part of the AWARE, students were asked to apply each framework using the pretext of a third party (see Appendix B9). In the pilot version, students were only asked to relate their own view to the frameworks (see Appendix B1). Using a third-party orientation rather than a self-orientation introduces an element of

affective detachment between the choices made and the consequences of those choices (Rybash et al., 1981). Therefore, it was expected that students would be able to evaluate the frameworks on a more objective footing. This tactic was partially successful, in that students' engagement with the question improved compared to the pilot but it was clear that some of the main criteria for each framework were not fully understood. In particular, there was confusion regarding the utilitarian perspective where students weighed costs and benefits in terms of finances or only human interests and did not consider the welfare cost to the animal. This may have been due to wording so the word 'cost' has been replaced with the word 'harm' in the definition for this framework in the updated version of the AWARE (available at http://vet.moodle.gla.ac.uk).

4.4.6   Ethical sensitivity

The median ethical sensitivity scores on pre and post-TESSs were similar to those found in first year life sciences students (Clarkeburn et al., 2002). Nevertheless, these scores could be considered low when the maximum score is 15. This indicates that students do not recognise ethical issues or do not prioritise them over questions of experimental importance. Smilansky (1996) argues that to be successful in an ethically demanding role (such as the veterinary profession), it may be necessary to dull ethical sensitivity, although he acknowledges this would take time. He outlines the dangers that increased ethical sensitivity can have. Although he is referring to interactions with humans in this article, many of the theories would apply, similarly, to dealing with animals. Smilansky states that increased ethical sensitivity can affect our coping ability, our psychological well-being, our awareness of other important ethical issues, and can even decrease our motivation to influence change. However, most authors would contradict this in favour of increasing ethical sensitivity in order to improve students' abilities to solve ethical dilemmas (Wittmer, 1992).

Animal welfare was a predominant theme in the students' answers with 84% and 92% on pre and post-TESS respectively listing an animal welfare consideration as part of their response. Although animal welfare was considered a dominant concern of the life science students in the original study, a relatively lower proportion (45%) of those students considered animal welfare in their response. So although the ethical sensitivity scores of

first year veterinary students were low, this does indicate that there is a high level of concern with regard to the welfare of animals involved in experiments.

Unexpectedly, students without degrees had higher ethical sensitivity scores than those with them. The highest score on the pre-TESS was for students in the second age group (19 years old). Heightened ethical sensitivity can be experience-based (Smilansky, 1996) so those with more life experience (older students and degree holders) were expected to achieve higher scores. Myyry & Helkama (2002) found similar results to this study where greater increases in ethical sensitivity scores were seen in younger social psychology students and those without a degree than older students and those with a degree. Nineteen year old students are more likely to have had to complete additional work experience before gaining a place at veterinary school and through this process may have become aware of the wider issues concerning animals, including ethical issues. In the case of degree holders, it may be that the impact of greater life experience is counteracted by the emphasis in scientific degrees on experimental robustness, making students more likely to comment on the scientific aspects of the proposal rather than the ethical issues. No gender differences were found, and this concurs with other studies on ethical sensitivity in university students (Clarkeburn et al., 2002; Myyry & Helkama, 2002). The number of males in the sample was small however, so repeating the experiment with a larger number of males would provide a more reliable result in relation to gender.

There was no difference in ethical sensitivity scores before and after completing the AWARE. This indicates that completing the AWARE was not effective in improving veterinary students' ethical sensitivity as measured by the TESS, although students were able to identify ethically relevant issues and reported improved ability in recognising ethical issues. Moreover, many authors would affirm that ethical sensitivity is an innate quality (Rest, 1982; Weaver, 2007) and therefore, may not be easily influenced by short educational interventions. That said, differences in ethical sensitivity as measured by the TESS were seen in life science students after completing a full ethics programme involving group discussion and PBL (Clarkeburn et al., 2002).

Methodological issues may have contributed to the lack of recorded improvement in ethical sensitivity. Although different scenarios were used, there may have been a degree of boredom associated with repetition (Myyry & Helkama, 2002). The post-TESS was not administered in a classroom situation, which may have influenced student engagement. The pre-TESS was run following a short lecture on ethics whereas the post-TESS was in

some cases administered many months later. Studies have shown that ethical sensitivity increases after ethics education (Bebeau & Brabeck, 1987; Baab & Bebeau, 1990; Clarkeburn, 2000) but if the educational effect is short lived then the duration between tests could have influenced the scores. Few moral sensitivity tests have been developed, and most are subject specific (e.g. the Dental Ethical Sensitivity Test (Bebeau et al., 1985), the Test for Ethical Sensitivity in Science and Engineering (Borenstein et al., 2008)), and the TESS was the most relevant of those available. Although validated (Clarkeburn, 2000), it has not been widely applied in practice and therefore the reliance of the measure may be questionable. The use of vignettes, although a common way of measuring ethical sensitivity, has been criticised for the lack of empirical evidence to support their effectiveness (Weaver, 2007) and some say that students could respond logically without any reference to ethics (Lowe et al., 2001). It would be advantageous for future research to create a profession specific measure for veterinary medicine that takes into account the special responsibilities veterinarians have towards animals.

4.4.7   Moral reasoning

It was anticipated that completing the AWARE would improve students' moral reasoning scores as measured by the DIT, but this was not the case. In fact, the post-AWARE DIT scores were lower than the pre-AWARE DIT scores. However, the post-AWARE DIT scores did not follow the expected pattern in many respects: the purge rate was higher than would normally be expected (20% instead of between 5 and 15%), the number of 'can't decides' increased dramatically (from pre to post-DIT) and consequently, the change in utilizer scores did not correspond with the changes seen in the profile indicators (Thoma & Rest, 1999). Anecdotally, students reported a lack of enthusiasm for the post-DIT. The decrease in score is likely to be attributable to test fatigue. Decreasing scores on the second assessment after educational interventions has been reported in veterinary students before (Abutarbush et al., 2006) and may be due to the repetitive nature of the testing. The DIT-2 is a long questionnaire, and there are correlations between increased test length and cognitive fatigue (Ackerman & Kanfer, 2009). The students were not told the purpose of the test which likely reduced their motivation to complete it properly. If students have low intrinsic motivation for the task then that is likely to have a negative effect on their performance (Ackerman et al., 2010). In addition, the test was in no way linked to assessed material, something that veterinary students are heavily driven by (Raidal & Volet, 2009),

and students may have viewed it as irrelevant, a waste of time, and extra unnecessary work on top of an already content heavy course. Students were retested in the first week of their second year, after returning from a three month break. This was done to maximise the number of AWAREs that were submitted but a shorter gap may have increased compliance (Dewhurst & Williams, 1998). As the score of the whole group decreased, test fatigue is the most likely cause rather than the AWARE itself.

Expecting a change in post-conventional moral reasoning through one ethics intervention was possibly overly ambitious. Improved ethical reflection (as evidenced by the AWAREs) is likely to enhance awareness of ethics in general but may not necessarily lead to the high level thinking required to improve post-conventional moral reasoning scores. A full course in ethics failed to improve moral reasoning scores of veterinary students (Self et al., 1995) and the formal clinical ethics teaching at Glasgow University (see Chapter 2) was also not successful in improving moral reasoning scores. Discussing ethical dilemmas has been a successful way of improving students' ethical reasoning. This suggests that increased participation in focus groups and more detailed discussion of the students' particular dilemmas after completing the AWARE could have improved students' scores post EMS. Research has shown that at least 20 hours of group discussion on ethical cases was required to see a change in DIT scores (Self et al., 1998b) so it is perhaps not surprising that completing an AWARE did not improve the DIT scores. However, it is intended that by improving students' awareness of ethics at an early stage in their training, they will gain more from experiences with an ethical component in later years.

It should also be noted that the DIT was not designed to assess the impacts of educational interventions and therefore it may not be an appropriate measure for detecting small changes in students' ethical development (Bebeau, 1993). In addition, the DIT is a social psychology measure and the concepts in it may be too far removed from the veterinary profession to reflect veterinary students' reasoning abilities when dealing with ethical dilemmas involving animals. Bebeau & Thoma (1999) stress that the use of unfamiliar problems is not reason to reject the DIT as a measure as students should be able to generalise the concepts and use them in novel situations. However, the foundation of scenarios used in standardised psychological tests such as the DIT is that all humans have equal worth and that preserving human life is a fundamental value. This is not something that can be straightforwardly transferred to veterinary medicine and dilemmas involving animals because there is no universal agreement on the value of animals' lives or our duties towards them.

4.5   Conclusion

Evidence of ethical reflection was sparse in the unstructured reflections but was reliably elicited by the AWARE, indicating that structuring the reflection helps to facilitate ethical content. Structuring the AWARE also encouraged more complex forms of reflection with dialogic reflection predominant in the AWAREs compared to descriptive writing in the unstructured reflections. Improvements in ethical sensitivity and moral reasoning were not seen as a result of completing the AWARE though this may have been impacted by methodological choices and student motivation. The qualitative analysis of the AWARE showed that students were able to construct valid arguments for and against different viewpoints and apply ethical frameworks to the situation. This demonstrates that pre-clinical veterinary students are capable of ethical reasoning at some level, though perhaps at a more basic level than that measured by the DIT. An engagement scale based on the intended learning outcomes found that students generally performed well and the majority of students perceived an improvement in their ability to recognise animal welfare and ethical issues. Collectively, various measures indicate that the AWARE promotes engagement with welfare and ethics and increases ethical content and reflection in post PC-EMS reports. The results suggest that this approach has value and provides a structure within which students may constructively reflect on ethically challenging situations experienced during EMS.

Chapter 5 – Further applications of the AWARE

Following validation of the AWARE, it was incorporated into a combined teaching package, named Welfare and Ethics Awareness via Experience (WEAVE). The first part of this chapter describes the creation of this package. The second part describes a pilot study where the concept of ethical reflection using a structured, self-directed learning tool was extended to clinical veterinary situations.

Part 1 – WEAVE

5.1 Introduction

Animal welfare and ethics are often taught together in veterinary courses (Main et al., 2005). The two subjects compliment each other as aspects of veterinary ethics are concerned with animal welfare, so to understand one, knowledge of the other is required (Sandoe et al., 2003). Improving veterinary students' ethical awareness is desirable because veterinary medicine is an ethically challenging profession, and veterinary education has previously been associated with inhibiting moral development (Self et al., 1991), and reducing empathy towards animals (Paul & Podberscek, 2000). The ability to assess welfare on farm is of vital importance for veterinary students because it allows them to identify sick animals, make welfare judgements that result in veterinary interventions and improved welfare, and ensure welfare standards are met (Main et al., 2003). One of the most reliable ways of assessing an animal's welfare is to look at its behaviour (Dawkins, 2004). Therefore, the ability to recognise behavioural cues relating to poor welfare is essential for veterinary students. Being able to use scales such as lameness scoring systems (Sprecher et al., 1997) that rely on animal observation and behavioural indicators are necessary in order to advise farmers and identify animals that are not thriving. Computer based instruction that included behavioural observation training has been used successfully to improve pre-clinical veterinary students' abilities to assess welfare (Wright et al., 2009). Computers and web-based technology are becoming routinely used within universities for teaching (Conole et al., 2008). The veterinary course at the University of Glasgow uses Moodle, a Virtual Learning Environment (VLE). The introduction of Moodle leant much

to the advancement of computers in supporting students' learning (Dale, 2008). Today's students are familiar with computers (Dale et al., 2011) so utilising this resource could be pertinent in creating engaging teaching packages.

As well as development of the AWARE, an additional aim of this project was to create a teaching package for pre-clinical Extra Mural Study (PC-EMS) that could be implemented into the veterinary curriculum of all UK veterinary schools. The overall objective of this teaching package was to maximise learning from PC-EMS; but more specifically was to improve learning in relation to students' ethical awareness and their ability to assess animal welfare using animal observations. The intention of the collaborative project between the Universities of Glasgow and Bristol was to create two learning tools, one which focused on improving students' abilities to assess animal welfare through behavioural measures and one which improved ethical awareness through self-directed reflection (AWARE).

The welfare assessment tool was created at the University of Bristol and took the form of a computer assisted learning (CAL) package named Partnerships in EMS (PIE) (created by A. Kerr). As described in Chapters 3 and 4, the AWARE was created at the University of Glasgow to promote ethical reflection in veterinary students. The two tools were validated separately in the individual institutions in session 2010-2011. In session 2011-2012, the objective was to create a combined package incorporating both tools (the WEAVE) and pilot it at the University of Glasgow with first year veterinary undergraduates. The success of the package would be evaluated through student feedback and the intention was that the two tools would compliment each other and completion of one would have positive effects on the completion of the other. Specifically, with reference to the AWARE, the aim was to investigate whether the combined teaching package would improve the students' ability on specific tasks, for example identifying relevant animal welfare issues for use in the AWARE.

5.2   Methods

To create WEAVE, the content of the AWARE and PIE teaching packages were amalgamated and uploaded to Moodle[12]. PIE included learning resources on sheep, cattle and horses. The PIE content (which was originally created on an alternative VLE, Blackboard) was reformatted to be compatible with Moodle but the integrity and structure of the package was maintained. Much of PIE involved students watching video clips of animal behaviour. In order for these to work on Moodle, they were put together as part of a 'quiz'. This involved reformatting the files so they were compatible with the question types available in Moodle 'quiz'. As the video clips were too large to be embedded in the 'quiz', html code was used to link to the video clips which were hosted on webspace at Bristol University. To create a recognisable identity for the CAL package, logos were created for WEAVE and the AWARE in Adobe Photoshop (see Appendix D1) (the PIE logo was created at the University of Bristol).

The teaching package that accompanies the AWARE provided the background information required to complete the AWARE (for information on the structure of the AWARE teaching package see section 3.5.2). The content was as in 2011, except for an additional explanation of reflection and its importance to veterinarians. First year veterinary students (2011-2012) at the University of Glasgow attended one of six sessions hosted in a computer laboratory. Students were assigned to groups alphabetically; group size ranged from 23 to 26. Two 90 minute sessions were run each Tuesday afternoon on three successive weeks in January and February 2012. Students were given written instructions to complete WEAVE and a facilitator was available to offer assistance as necessary. After logging on, students first went to a WEAVE welcome screen (see Appendix D2) which had links to the two packages. Students were asked to complete the AWARE teaching package first, followed by PIE.

PIE consists of two lectures: 'What is Welfare?' and 'Introduction to Five Freedoms'. Once the students had reviewed these lectures, they then completed an online quiz. Due to time constraints, students were requested to complete only the sheep material,due to its relevance to the lambing placement completed by the majority of students in the spring.

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[12] The WEAVE package is available on the University of Glasgow's Moodle site at http://vet.moodle.gla.ac.uk/course/view.php?id=347

Students watched five videos of sheep and answered questions corresponding to the sheep's behaviour. The video analyses and subsequent questions focus on the Farm Animal Welfare Council's Five Freedoms (FAWC, 1979). The package introduces students to two types of behavioural assessment, objective and subjective. The student watches a video and is then asked to identify which behaviours were observed (objective measure), e.g. walking, standing, vocalising (Figure 5.1, © A.Kerr, University of Bristol). Thereafter, the student is asked to rate how the behaviour reflects a particular adjective on a scale of 1-100 (subjective measure), e.g. does the sheep appear agitated? This subjective measure is based on "qualitative behaviour assessment (QBA)". QBA is a system of assessing behaviour that relies on qualitative descriptors rather than quantitative measures (Wemelsfelder et al., 2000). Finally, students were asked to test their understanding using a worked example.
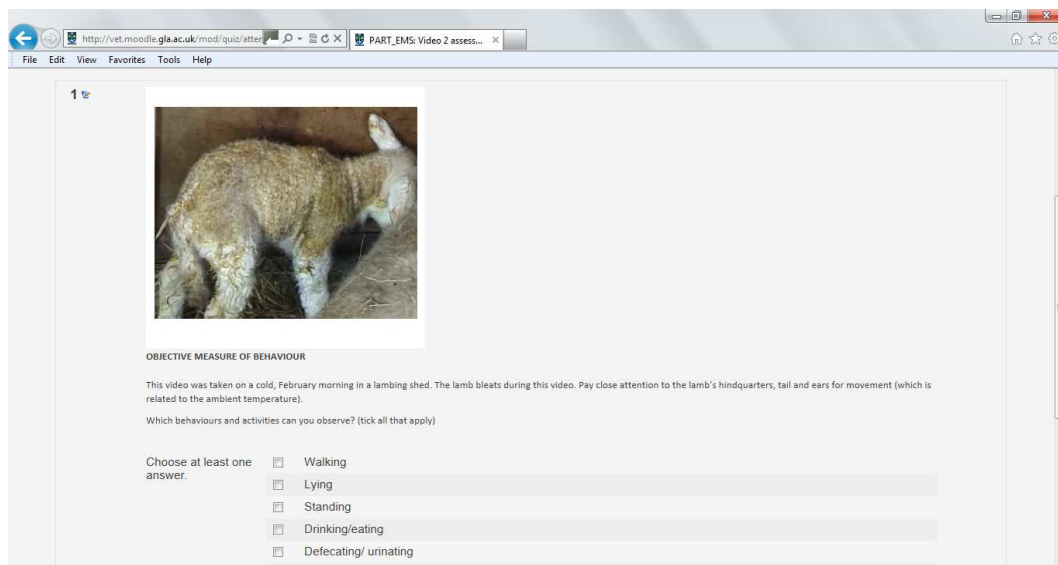
Figure 5.1: Screen shot of video of sheep behaviour used in the Partnerships for EMS CAL package

On completion of the computer session, students were asked to submit two pieces of written work, the AWARE and a Five Freedoms Farm Report. The deadlines for these submissions followed periods in the year that were popular for students to complete PC-EMS (April and September). Only AWAREs submitted in April were included in the analysis. No analysis was carried out on the Five Freedoms Farm Reports as these were part of the Bristol study. To examine the effects of the combined teaching package, feedback was sought from the participating students after they had completed an AWARE. A link to an online feedback survey hosted on SurveyMonkey (www.surveymonkey.com © 1999) was emailed to students on receipt of their completed AWARE. The survey had 15 questions and sought student opinion on both teaching packages (Appendix D3). Ethical

approval was not required because completing WEAVE was a compulsory part of the curriculum. However, students could opt out if they did not want their response to be used in this research project. Thus, not all students were sent a feedback survey. AWAREs that were included in the analysis were anonymised as were the feedback responses. The content of these AWAREs was not analysed in depth, but the types of welfare issues identified were noted. Feedback was used to provide an insight into the students' experiences. Chi-square tests were carried out in SPSS (IBM, USA) to determine whether the percentage of students agreeing with particular statements in the feedback survey changed from 2011 (AWARE only) to 2012 (AWARE as part of WEAVE).

5.3   Results

Out of a total of 149 students, 83 submitted AWAREs in April 2012 and agreed for their data to be used in the project. The majority of the AWAREs (83%) were based on student experiences on a lambing placement. Observations of the students during the WEAVE session indicated that students were willing to engage with the teaching package. Students were able to navigate their way through WEAVE with minimal assistance from the facilitator.

The response rate for the feedback survey was 40%, with 33 students completing it (8 males and 25 females). The majority of students (66%) reported in the feedback survey that they found the courses easy to follow. The students' preference was for the computer based format rather than a traditional lecture, and 65% of students agreed that being able to refer back to the relevant material on Moodle was helpful. Of particular interest was whether completing the combined package would positively impact the students' ability and engagement with the AWARE, e.g.. would providing information on animal welfare issues enable students to identify a relevant incident to discuss in their AWARE. Figure 5.2 shows that, compared to the previous year (2011), a similar percentage of students liked the free choice of incident to write about and that this percentage remained high. Difficulty identifying an incident to reflect on dropped from 62% to 42% of students after the introduction of the combined package. The percentage of students expressing apprehension about writing negative comments about other people's actions dropped from 60% to 45%; those that felt uncomfortable including their personal feelings reduced from 30% to 13%, and the percentage of students that found it difficult to complete the AWARE decreased

from 33% in 2011 to 13% in 2012. In addition, there was an increase in the percentage of students (70% to 83%) reporting that they felt more aware of animal welfare issues on farms having reflected using the AWARE. The percentage of students that strongly agreed with the latter increased from 25% in 2011 to 61% in 2012. Although numerically these results represent large differences, no statistically significant differences were found in the percentage of students that agreed/disagreed on each question from 2011 to 2012 (chi-square tests).
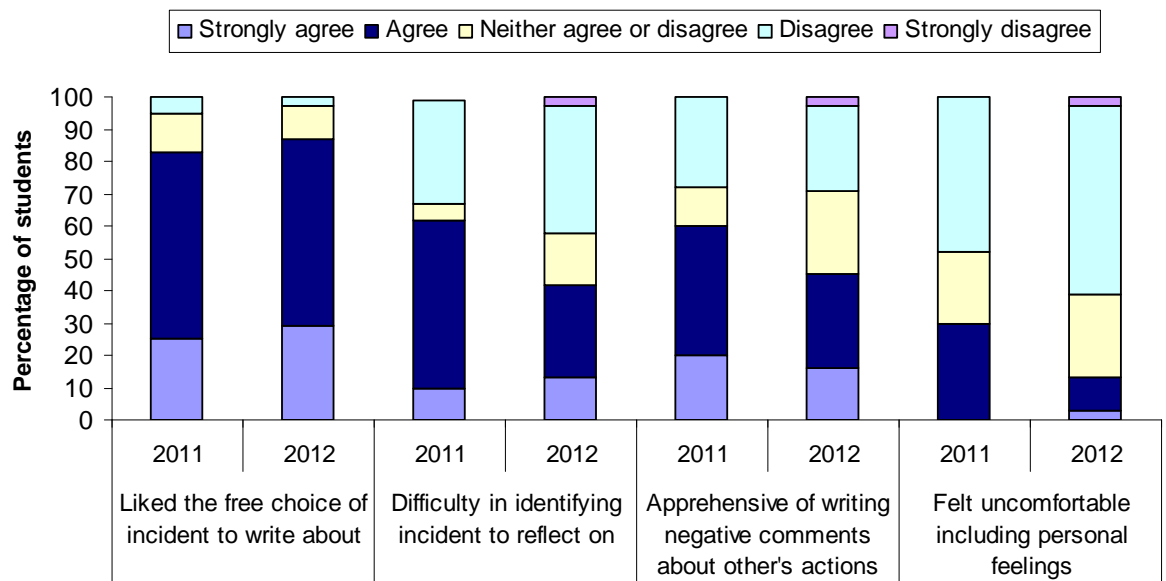
Figure 5.2: Student feedback responses on the impact of the AWARE in 2011 and 2012 first year cohorts

2011 = AWARE alone   2012 = AWARE as part of WEAVE

PIE was viewed as relevant by 61% of students, and it was perceived to have improved knowledge of animal welfare and of welfare management strategies in 48% and 45% of students, respectively. Regarding the two methods of measuring behaviour, 90% of students fully understood the objective measures of behaviour compared to 71% for the subjective measures of behaviour (QBA). The majority of students felt that the PIE computer programme improved their ability to assess an animal's welfare needs through the appearance of the animal and through the behaviour of the animal (61% and 58% respectively).

5.4   Discussion

The WEAVE package was administered successfully to the full cohort of first year veterinary students at the University of Glasgow. The format of the package was easy for the students to follow and students were able to complete the learning materials with minimal input from teaching staff. Animal welfare and ethics expertise is not available at all veterinary schools and WEAVE provides an introductory animal welfare and ethics teaching package for veterinary schools that could be used in the absence of that expertise.

The feedback gained from the students does indicate that the suggested aims of the exercise were achieved and that PIE had a positive influence on ethical awareness. Improvement in student feedback from the previous year, provides evidence of the benefits of delivering the AWARE as part of the wider WEAVE package. In particular, the reduction in the number of students struggling to identify a suitable welfare incident may indicate that combining the AWARE with a welfare identification teaching package was helpful. Including personal feelings and critiquing actions are important factors in critical reflection (Donaghy & Morss, 2007). The decrease in students concerned about these aspects is probably due to the expanded explanation of reflection and its benefits included in the amended AWARE teaching. This explanation was not included in previous years because it was necessary to validate the AWARE and its objectives before sharing its purpose with the students. Veterinary students have been said to focus their learning on what they think will be examined (Blumberg, 2005) and it has been postulated that medical students, who have a similarly heavy workload to veterinary students, may be less inclined to participate in exercises that do not directly relate to their studies (Nolan & Smith, 1995). Veterinary students therefore are likely to show resistance to exercises where the benefit is not clear. Relating this exercise to their role as a veterinary surgeon may have assisted in reducing the number of students hesitant to engage with these pivotal steps of reflection.

In contrast to some previous studies (e.g. Dale, 2008), the students preferred a computer-based format to traditional lecture for this topic. In Dale's (2008) study on the use of educational technologies in undergraduate veterinary curricula, students stated that CALs were "not an acceptable replacement for didactic lectures". Other reasons given were that the programmes could be slow, were of variable quality, could be too detailed, take too much time, and students were unwilling to looking at the computer screen for long periods.

The CAL package that accompanied the AWARE was used in a supplementary way so this may have contributed to its popularity. When the CAL package was designed, care was taken to ensure that it was not overly long and that content loaded quickly. Current students are part of a generation often referred to as 'digital natives'. Their increase in the use of the internet for daily tasks such as banking (Dale et al., 2011), and their acceptance of the computer-based format may indicate a preference for teaching that relies on technology and reflects changing attitudes towards this type of teaching. This teaching package also helps to tackle the underutilisation of Moodle within Glasgow veterinary school that has previously been highlighted (Dowell & Barrett, 2011).

The PIE was viewed by the majority of students to have improved their ability to assess an animal's welfare needs. It might be expected that on-farm experiences would be most memorable and therefore most effective in improving students' abilities, but these results indicate that completing online examples can improve students' reported abilities to assess welfare and may provide a more cost-effective alternative to class farm visits. Its other advantages are that it does not require much staff involvement and can be completed in a short time.

Although the majority of students (66%) found the WEAVE package easy to follow, there was a relatively high percentage of neutral answers to this question (22%) and in many of the other questions in the feedback survey. It is difficult to ascertain why there was such neutrality; whether students did not have an opinion, did not complete particular parts of the teaching package or did not feel the aspect in question had any impact on them is impossible to tell. More detailed feedback from students, through focus groups or open-ended survey questions, would be required to clarify the reasons.

Combining the teaching package has improved students' perception of the AWARE but the small sample size and the possibility of cohort effects limit the strength of these results. Qualitative analysis of the content of the AWAREs written by this student cohort would fully elucidate the effects of the combined WEAVE package.

The WEAVE now forms part of the Veterinary Professional and Clinical skills course for first year veterinary undergraduates at the University of Glasgow. The material has been designed in such a way that it is easily transferable to other VLEs and it is available to all UK veterinary schools should they wish to introduce this teaching package. The AWARE

has already been used by first year veterinary students at Liverpool and Bristol Universities.

Part 2 – Adapting the AWARE for clinical contexts

5.5   Introduction

Clinical veterinary students make an abrupt transition from science-based, classroom centred teaching to subject-integrated, patient-centred learning. This can lead to students becoming anxious and stressed (Magnier et al., 2011). Up to this point, students' learning has predominantly been externally controlled (teacher-led) but in the clinical phase students are expected to adapt to using more independent learning styles (Raidal & Volet, 2009). Adoption of independent learning approaches, such as self-directed learning and reflection on experience, are thought to foster improvement in clinical reasoning and are vital in order to create competent practitioners (Raidal & Volet, 2009; Wald et al., 2009).

Veterinary students are required to complete 26 weeks of clinical EMS in their final three years of veterinary medicine (Taylor & Barnes, 1998a) where they are encouraged to experience a broad range of veterinary work which generally includes small animal, farm animal and equine practice. The principle aims of clinical EMS are to strengthen students' abilities to identify and treat a range of diseases and conditions across all species of domestic animals and to improve other clinical and non-clinical skills. Other important learning outcomes are that students understand why certain actions are taken and what factors have influenced those decisions, as well as learning "to question what they experience" (Taylor & Barnes, 1998a); all important factors in reflective activity.

Veterinary students' experiences during clinical rotations and EMS often provide their first impression of how life as a veterinarian will be (Cornell, 2008). This transition raises new challenges as students take on more responsibility and face clinical and ethical decision making for the first time. In particular, students on clinical rotations are often party to dilemmas and their consequences. In contrast to PC-EMS, where students mostly encounter dilemmas involving farmers or stockpersons (see section 4.3.2), during clinical rotations students witness firsthand dilemmas faced by practising veterinarians. This introduces the concept of professional ethics: ethics that are unique to members of that particular profession due to the responsibilities that come with their professional status (Morgan & McDonald, 2007). In veterinary medicine these responsibilities could be said to

be more complex than in other professions as veterinary surgeons have obligations to both their clients and their animal patients, as well as to society, their peers, their practice and themselves. Veterinarians also have the added complication that they are caring for an animal patient who is not autonomous and for whom prolongation of life is not always a fundamental goal of their care. Professionalism in veterinary ethics has been referred to as no more than etiquette (Main et al., 2005) but it has been argued that it is more than that. It includes respectable conduct and aspects of character, the ability to make sound, defensible decisions, both clinical and ethical, through a balanced reasoning process it takes into account the principles that underlie those decisions; it considers their intentions and their actions; and it involves recognition of responsibilities and duties as a professional that form part of a 'social contract' (May, 2011).

Professional conduct in the veterinary profession is regulated by the Royal College of Veterinary Surgeons (RCVS) who provide guidelines on how veterinary surgeons are expected to behave while carrying out their role. There are ten guiding principles set out by the RCVS[13] (2010a) (Table 5.1), which include animal welfare being the first consideration of veterinary surgeons, treating animals humanely and with respect, maintaining good relationships with clients and colleagues and upholding the reputation of the veterinary profession. Whether the RCVS's Guide to Professional Conduct (RCVS, 2010a) is widely used by practising veterinarians for guidance is not clear (Moore, 2009). The RCVS's guide is designed to outline veterinarians' moral obligations but it does so in a limited way. Much of the guidance is left to individual interpretation for example, what constitutes treating animals with respect may be different in one practitioner's view to another's (Morgan, 2009). There is no weighting of which guideline should take priority, which means they offer limited practical guidance on how to deal with ethically problematic scenarios. Moreover, in many circumstances, the individual guidelines are irreconcilable, e.g. if animal welfare is the first consideration then that may go against the client's wishes, jeopardising the relationship (or vice versa). These shortcomings highlight the ethical difficulties faced by veterinarians and that there is not much practical guidance available to help them resolve conflicts of interest. Similarly, when clinical veterinary students witness these dilemmas in practice they may have unanswered questions as to why things were done a particular way or not done, or they may be concerned with how they are going to cope with making similar decisions. Providing an opportunity for them to reflect on

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[13] The RCVS updated the Guide to Professional Conduct in April 2012 to a Code of Professional Conduct (Anonymous, 2012) but the ten guiding principles used were still in place when this exercise was initiated.

firsthand experiences may help them to resolve some of these questions and should also raise awareness of the types of ethical conflicts that are regularly faced by veterinarians in practice.

Your clients are entitled to expect that you will:
1) make animal welfare your first consideration in seeking to provide the most appropriate attention for animals committed to your care
2) ensure that all animals under your care are treated humanely and with respect
3) maintain and continue to develop your professional knowledge and skills
4) foster and maintain a good relationship with your clients, earning their trust, respecting their views and protecting client confidentiality
5) uphold the good reputation of the veterinary profession
6) ensure the integrity of veterinary certification
7) foster and endeavour to maintain good relationships with your professional colleagues
8) understand and comply with your legal obligations in relation to the prescription, safe-keeping and supply of veterinary medicinal products
9) familiarise yourself with and observe the relevant legislation in relation to veterinary surgeons as individual members of the profession, employers, employees and business owners
10) respond promptly, fully and courteously to complaints and criticism

Table 5.1: The ten guiding principles from the RCVS's Guide to Professional Conduct (RCVS, 2010a)

The results of the study described in Chapter 4 demonstrated that ethical reflection in first year veterinary students was significantly enhanced by the AWARE, and the majority of students felt that completing the AWARE had improved their ability to recognise and reflect on animal welfare and ethical issues. Using the AWARE as a template for a similar reflective exercise with clinical students is a logical extension. Some researchers feel that the focus on animal welfare has detracted from other aspects of veterinary ethics (May, 2011), and have emphasised the importance of including aspects of professionalism in ethics teaching. This exploratory study aimed to create and pilot two modified versions of the AWARE that were relevant to clinical situations. One, very similar to what will now be referred to in this chapter as the pre-clinical AWARE, focused on welfare on large animal clinical EMS placements; the other retained the structure of the pre-clinical AWARE but moved the focus from animal welfare to that of professional ethics. It was felt that ethical frameworks could give students context with which to examine their professional role in

relation to ethics. Therefore, a number of frameworks were considered relevant for inclusion and the applicability of these frameworks in a professional ethics reflective exercise was investigated. The tools, similarly to the pre-clinical AWARE, aimed to raise awareness of ethical frameworks, but additionally aimed to raise awareness of professional responsibilities in clinical veterinary students.

5.6   Methods: Testing new applications of the concept of ethical reflection

5.6.1   Modification of the AWARE for use in clinical EMS

Few changes were required to the pre-clinical AWARE for use in large animal clinical EMS. The wording on the pre-clinical AWARE was altered to make it relevant to clinical placements by changing any mention of pre-clinical EMS to that of clinical and in the Round Up section inserting the words 'clinical practice' instead of 'accepted practice' (see Appendix B9 for layout of the pre-clinical AWARE).

5.6.2   Development of a reflective tool for professional ethics

To create a reflective tool which focused on professional ethics rather than animal welfare, the structure of the pre-clinical AWARE was retained but the guiding prompts were altered in view of the new focus. Discussions on content were held with two members of staff at Bristol University; one who teaches professional ethics and one clinical member of staff with responsibility for the professional studies course, of which the exercises were a part. The particular focus of these discussions was which ethical frameworks might be relevant for inclusion in a clinical ethics exercise.

Virtue ethics was one such framework. Virtue ethics is concerned with the character of the person involved in the action, in this case, a veterinary surgeon, and their motivation for taking said action (Main, 2011). The first codes of professional conduct in veterinary medicine were based on attributes that pertain to virtues; describing the importance of "honour, faith and mutual trust in the relationship between practitioners" and unethical behaviour as "unbecoming to a professional man" (Woods, 2011). This concept of

professionalism could be said to be traditional but veterinarians today are expected to display similar characteristics. In addition, May (2011) highlights the importance of integrity, honesty and altruism. As virtue ethics focuses on personal attributes as benchmarks of professional behaviour it was thought pertinent to include it in this exercise.

Bioethical principles (*beneficence*, *non-maleficence*, *respect for autonomy* and *justice*) (Beauchamp & Childress, 1974) are regularly applied in human medicine and may have applications in veterinary medicine for helping to resolve dilemmas. However, it must be noted that, as the animal patient is not autonomous, autonomy for decisions is usually conferred on the client. There is much support for the use of the bioethical principles as a framework to help resolve morally difficult decisions (Gillon, 2003; Macklin, 2003; Campbell, 2003; Ebbesen & Pederson, 2007). Supporters claim that the bioethical principles are clear, easy to understand, and have been applied successfully in many different situations (Campbell, 2003). They have been used as the basis of courses in veterinary ethics (Rutgers, 2011), to illustrate the importance of good veterinary professional conduct (May, 2011), as the foundation of the ethical matrix (Mentham, 2005) and have underpinned ethical sensitivity measures in medicine (Hebert et al., 1992) and nursing (Ersoy & Goz, 2001). One of the reasons that the bioethical principles are so frequently relied upon is because they are helpful for non-philosophers to use to make sense of ethical dilemmas (Gardiner, 2003), and in this sense they may be useful for veterinary students.

In addition to these two ethical frameworks, the inclusion of the ten guiding principles from the RCVS's Guide to Professional Conduct was considered relevant. The inadequacies of the guide in relation to solving ethical conflicts have been highlighted and it was of interest to investigate whether the principles could be adhered to in difficult situations. It also highlights the different professional responsibilities of veterinarians (to the animal patient, client, colleagues, profession), essential in a clinical ethics tool designed to raise ethical awareness. The three frameworks described above were also expected to be relatively easy for students to understand and apply to their chosen incident.

The reflective tool was named the Reflection on Professional Ethics (ROPE) (Appendix D4) and the steps within the ROPE are illustrated in Figure 5.3. Information on the three frameworks used was included in an introductory page.

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┌─────────────────────────┐
│   Select and describe an │
│  ethically relevant event│
│   or issue involving a   │
│  veterinarian's action   │
│   that they felt had     │
│   ethical implications   │
└─────────────────────────┘
             │
             ▼
┌─────────────────────────┐
│   Personal reflection    │
│   (same as in AWARE)     │
└─────────────────────────┘
             │
             ▼
┌─────────────────────────┐
│   Ethical reflection     │
│  (first 4 prompts same   │
│     as in AWARE)         │
└─────────────────────────┘
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| Consider if and how the action described contravened the ten RCVS guiding principles | Consider the veterinarian's actions with regard to the four bioethical principles | Consider the virtues thought to have been demonstrated or shied away from by the veterinarian |

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┌─────────────────────────┐
│   Sum up impact of       │
│   placement and          │
│   consider future actions│
└─────────────────────────┘
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Figure 5.3: Illustration of the prompts used to guide the student through the Reflection on Professional Ethics

5.6.3 Pilot of clinical ethics tools

All fourth year veterinary students (2011-2012) at Bristol University were given the option of completing either the clinical AWARE or the ROPE (n=98). The tools were provided to them as part of a compulsory professional studies module, so their use did not require ethics approval, and students were given the choice to opt out if they did not wish their response to be included in this research project. The task was introduced in two whole year

sessions of 20 minutes near the beginning of terms 1 and 2 where they were briefed by both ethics and professional conduct tutors. In this session, no examples were given to try and avoid directing students to particular issues or dilemmas. Students were given three months in which to identify a topic to use as the basis of their submission. This timescale allowed them to use an experience from either a summer or Christmas placement. Reflections were submitted electronically. Once students submitted their completed reflections, these were anonymised and sent to the primary researcher for analysis. Demographic information was collected for both exercises which included sex, nationality, age, whether the student already held a degree, and whether they grew up in an urban area, a rural area or on a farm. Students were also asked to complete an online feedback survey (SurveyMonkey) on the exercise. The link to the survey was sent to participating students via email and was available for two months.

5.6.3.1 Analysis

For the clinical AWAREs, issues and events chosen were categorised using the same headings as those used in Chapters 3 and 4 (see Appendices B4, B5 & B6). The clinical AWAREs were also assessed for level of engagement (for the scale used see section 4.2.2.2). Chi-square tests were carried out in SPSS to determine whether there were any differences in the level of engagement between preclinical and clinical students and also in the proportions of students at each stage that gave particular answers in relation to their experiences on large animal EMS.

The types of incidents chosen by students completing the ROPE were grouped into critical incidents that were ethically relevant because of the veterinary surgeon's actions or fell under the veterinary surgeon's responsibility, and those that were ethically relevant because of the owner's actions or where the responsibility lay with the owner. Content of the responses in relation to levels of reflection and ethical content was not qualitatively analysed in the ROPEs, rather the focus of the analysis was on the applicability of the three frameworks that had been introduced. Analysis involved noting which RCVS guiding principles students referred to in their reflections, and whether these principles were considered by the student to have been adhered to by the veterinary surgeon; which virtues they thought were relevant and had been displayed; and whether the student thought each of the four bioethical principles had been met or not. Answers for the bioethical principles

prompt were classified into one of five categories – fulfilled, not fulfilled, unsure, did not say or unable to say (because the student misunderstood the basis of the principle). Judgement on whether the student had understood the principle was made by the researcher in conjunction with the definitions set out in the ROPE (see Appendix D4). With regards to the principle of *autonomy*, this was applied in relation to the client as the animal's proxy decision maker rather than to the animal patient themselves.

5.7   Results

5.7.1   Clinical AWARE

5.7.1.1 Overview

Nineteen clinical AWAREs were included in analysis (one student recounted an experience on pre-clinical EMS so this was removed from the sample). All of these students were British, none held degrees and their ages ranged from 21 to 23 years old. The sample was made up of 13 females and six males. A small number were from farms (10%); the majority were from a rural area (58%).

All students selected a suitable incident affecting welfare that had ethical implications. Students reported on incidents that involved a variety of species: cattle (n=8), horses (n=7), sheep (n=3) and goats (n=1). All students stated that the incident had a negative impact on animal welfare, with one student noting that their incident also had positive consequences. All students aligned with either a hybrid or a utilitarian perspective.

Fifty-eight percent of students chose to write about a specific event and 42% reported on wider welfare issues[14]. Examples of students' reflections included inadequate pain relief during castration of calves, dehorning of cattle, a pre-emptive caesarean of a Belgian Blue cow, persistent lameness in a horse that was not responding to lengthy treatment, poor management of horses with laminitis, and infected wounds on horses due to owner's lack of knowledge. The highest proportion of events and issues were categorised as relating to

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[14] A specific event impacted one or two animals and was an isolated occurrence e.g. owner's refusal to allow euthanasia of a very sick goat and a wider issue was one that impacted a group of animals such as dehorning of cattle.

'health' (0.42), followed by 'husbandry practices' (0.26) and 'stockmanship' (0.16) respectively. In the clinical AWAREs describing incidents involving cattle, the most common categorisation was 'husbandry practices' and in those reporting on welfare in horses, owners' lack of knowledge (stockmanship) most often led to the welfare issue described.

In their reflections, 21% of students did not identify the animal as an affected party. Most reflections involved an action that the student had observed. For 58%, it was their first experience of the welfare issue. The majority of students (68%) shared their feelings with someone else. Of these students, 47% shared them with the veterinarian, 32% with other students and 21% with their family. Almost all students (89%) considered what they would do in the future were they to encounter this situation again, and 74% did not give any unsatisfactory responses (e.g. providing an illogical argument, using mismatched reasoning in support of an ethical framework) and responded to all prompts. In comparison to first year students at Glasgow University, a larger percentage of fourth year students at Bristol University considered what they would do in a similar situation in the future (chi-square, $p < 0.05$).

5.7.1.2 Levels of engagement

Overall, students engaged well with the clinical AWARE and all students achieved a satisfactory score or above (for scale details see section 4.2.2.2). The proportion of students achieving each level of engagement is shown in Table 5.2. Example excerpts from students' responses are provided. These examples illustrate each level but it should be noted that the exercises are assessed as a whole and students' answers to one prompt do not necessarily indicate the engagement score awarded. Pre-clinical and clinical students showed similar levels of engagement on their respective AWAREs (chi-square test).

Level of engagement	Proportion of clinical AWAREs	Excerpts from student responses
Excellent (5)	0.32	"It made me ponder how different individuals make their ethical decisions and how each person will have a different view of what equates to animal cruelty, even though anyone who has entered the veterinary profession has done so with original intentions of helping animals."
Good (4)	0.37	"The situation did remind me how frequently owners struggle to accept euthanasia as the kindest action, in some cases. This is for all animals but I think possibly worse in small animals. It also highlighted the issue of animal shelters/petting zoos. They are very unregulated and quite often a bit shabby due to lack of funds so I think vet practices should offer more help (e.g. discounted rates) to the owners to aid animal health and welfare….. In the future I would remember to be very tactful when speaking to clients like this and work to persuade them to what I see as the best action for the animals welfare."
Satisfactory (3)	0.32	"I had already seen similar cases regarding horse welfare. Ultimately I believe that the client wants the best for their horse, but this is limited by their understanding, knowledge and finances. I would find it quite difficult to respond to a client reasonably if I felt an animal's welfare had been compromised, but understand the importance of doing so to avoid alienating the client from seeking veterinary assistance and thus putting animals at a greater risk of welfare compromise."

Table 5.2: Proportions of fourth year veterinary students engaging to different levels on the clinical AWARE with illustrative examples

5.7.1.3 Emotions

Seventy-nine percent of the emotions chosen by fourth year students to describe how they felt about their chosen incident were negative (compared to 67% in first years (see section 4.3.2.1)). *Concerned* was the most commonly chosen emotion (53%), followed by *frustrated* (42%) and *uncomfortable* (37%) (Figure 5.4). *Empathy* was the most commonly

chosen positive emotion (32%). A similar pattern of emotions were selected by students completing pre-clinical AWAREs: *concerned* (38%), followed by *empathy* and *shocked* (both 23%), helpless (21%) and frustrated and uncomfortable (both 20%). However, the range of emotions chosen was narrower in fourth year students.
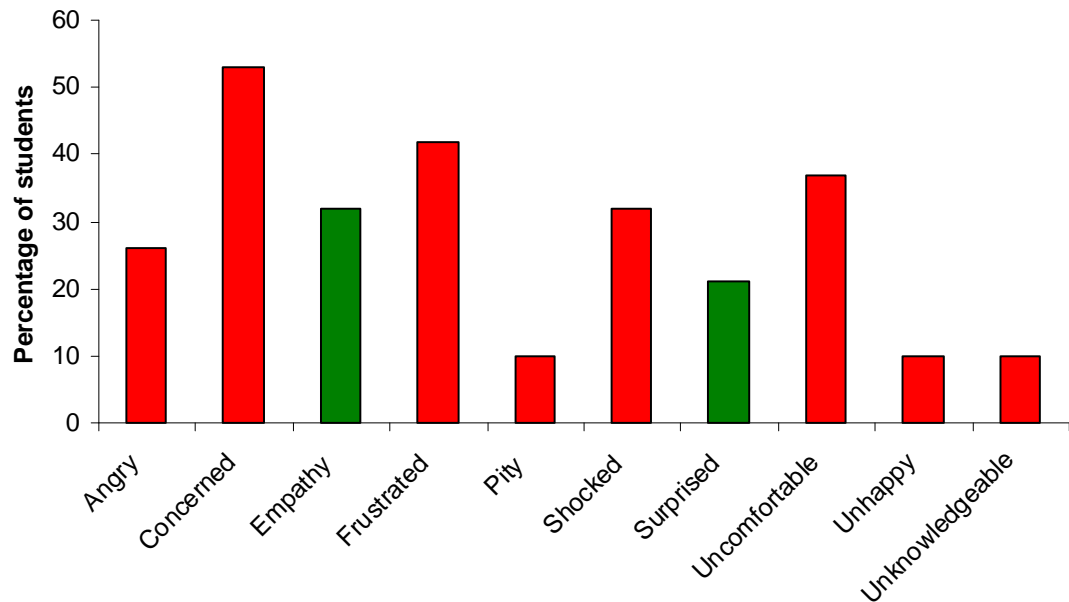
Figure 5.4: Emotions chosen by students to indicate their feelings while completing clinical AWAREs

Red indicates negative emotions and green positive emotions. No neutral emotions were chosen. Any emotion with an original count of 2 or less was not included in the graph.

5.7.2   ROPE

5.7.2.1   Results overview

Thirty students completed ROPE (26 females and four males). Their ages ranged from 21-29 years old, with 13% having already completed a degree. The percentage of students brought up in an urban area was 57%, with 40% having been brought up in a rural area and 3% on a farm. The majority (93%) of students were British.

All students chose suitable incidents to reflect on. Of the ethically relevant events chosen, nine involved a cat, 17 involved a dog, one involved both a cat and a dog, one involved a

horse and two did not involve an animal. Most of the reflections (87%) described a particular event, with the remainder describing their chosen situation in the wider context of veterinary medicine; for example one student reported on a case where the clients were re-mortgaging their house to pay for their pet's treatment and discussed the broader issue of clients being able to afford treatment and the ethical issues associated with veterinary practice management.

A variety of topics were chosen by the students who completed the ROPEs. There were 20 ROPEs attributed to veterinary responsibility and 10 attributed to client responsibility. Examples of former incidents were neutering of pregnant animals requested by local animal charities and euthanising offspring[15], substandard veterinary care, veterinarians carrying out procedures that were questionable or had a negative welfare impact (e.g. tail-docking in dogs where client indicated they were not working animals), and issues around consent, client confidentiality and relationships between colleagues. Examples of incidents where the ethical responsibility was considered to be primarily the client's included over-treatment or refusal to euthanise by owner, financial limitations to the animal's treatment, requests for healthy animal euthanasia and welfare issues that were caused by the owner (e.g. clients admitting they would take their dogs elsewhere to have their tails docked).

5.7.2.2 RCVS's ten guiding principles

Of the 30 ROPEs completed, 19 students referred to Principle 1 (animal welfare should be the first consideration) and Principle 4 (fostering and maintaining a good relationship with clients), with 15 students referring to Principle 2 (ensure animals are treated humanely) and 12 referring to Principle 5 (upholding the reputation of the profession). Three students referred to all ten principles collectively and said they were all met. Principles 8 and 10 were not relevant to any critical incident chosen by the students (legally comply with obligations in relation to veterinary pharmaceuticals and responding to complaints respectively).

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[15] Students focused on whether the offspring should be euthanized rather than neutering as the ethical dilemma

With regards to whether students thought the guiding principle had been met by the practising veterinarian (Figure 5.5), 74% (of 19 veterinarians) were considered to have contravened Principle 1, 40% (of 15 veterinarians) were deemed not to have treated the animal humanely or with respect and 53% (of 19 veterinarians) were considered not to have met Principle 4 (maintain a good relationship with clients). Principle 5 was not thought to have been upheld by the veterinarian in the opinion of 50% of the students that cited that principle (n = 12) and Principle 7 (maintaining good relationships with colleagues) was not thought to have been met in the opinion of 60% of students (n = 9). Whilst explanations given by students for practitioner compliance with the principles were correct, there were cases where the student omitted to mention principles of importance. For example, in a case where the practising veterinarian did not want to interfere with a colleague's treatment plan, the student did not mention Principle 7 (maintaining good relationships with colleagues) in their response, despite its relevance.
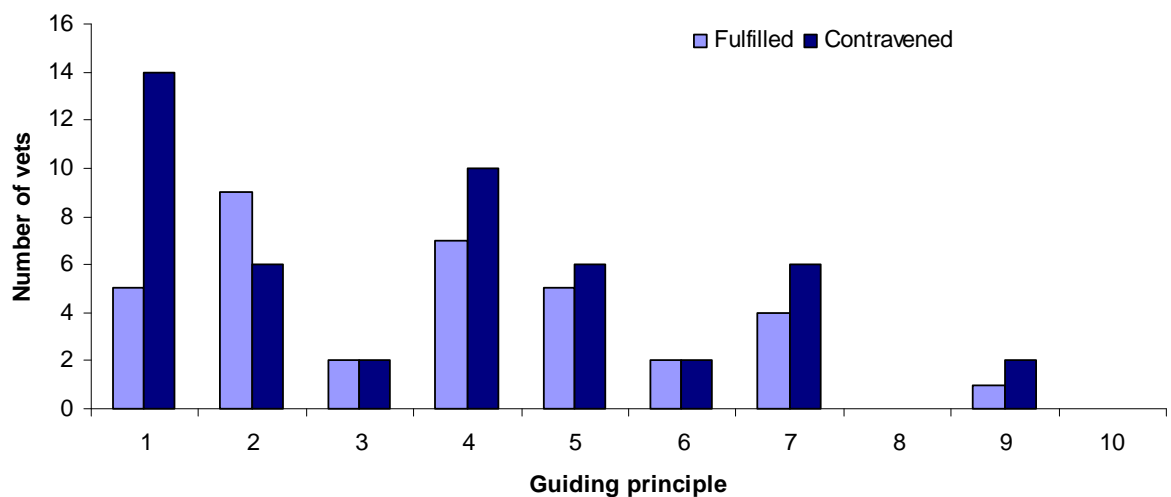
Figure 5.5 Number of veterinarians perceived by fourth year veterinary students to have fulfilled or contravened each RCVS guiding principle

Two students that cited principle 4 and one student that cited principle 5 did not state whether they thought that particular principle had been met or not in their chosen scenario.

5.7.2.3 Bioethical principles

Twenty nine ROPEs were available for analysis in reference to the bioethical principles as one student deleted the question. The results for whether the principles were met or not are shown in Table 5.3. Respect for client *autonomy* was perceived to have been fulfilled in

69% of cases, with *non-maleficence* and *justice* being conformed to in 45% and 41% of cases respectively. Twenty eight percent of students thought the principle of *beneficence* was followed, with 31% believing it was not. *Non-maleficence* was thought to have been infringed in 34% of cases and *justice* in 27% of cases. Three students stated that all four bioethical principles were met in their critical incidents, and all students thought at least one of the principles was complied with. *Beneficence* appeared to be the principle where students were most disinclined to answer, with 28% of students not stating whether they thought that particular principle had been fulfilled.

Principle	Criteria	Fulfilled	Not fulfilled	Unsure	Did not say	Unable to say
Beneficence	To do good; involves balancing the benefits of treatment against the risks and costs.	28	31	3	28	10
Non-maleficence	To do no harm; if the treatment involves some harm, the harm should not be disproportionate to the benefits of the treatment.	45	34	0	10	10
Respect for autonomy	Respecting the decision-making capabilities of autonomous persons. Here, this is the client's autonomy as patient is unable to make informed choices.	69	14	0	3	14
Justice	Be fair; distribute benefits and costs fairly and treat patients in similar positions equally.	41	27	7	3	21

Table 5.3: Percentage of fourth year veterinary students reporting whether each bioethical principle had been fulfilled in relation to ethical incidents witnessed during clinical EMS

With respect to the understanding of the four bioethical principles, the majority of students understood the basis of each principle (as judged by the researcher) (Table 5.4). Of the 29 students, 62% understood all four principles. *Justice* was the most poorly understood with

24% of students failing to demonstrate an understanding of this principle. The other three principles were understood by at least 90% of the students.

Principle	Understood	Did not understand	Not answered	N/A
Beneficence	97	3	0	0
Non-maleficence	90	10	0	0
Respect for autonomy	93	3	0	3
Justice	76	17	7	0

Table 5.4: Percentage of fourth year veterinary students that understood the concept of each of the bioethical principles

5.7.2.4 Virtue ethics

In response to the question, 'what virtues do you think were adhered to or gone against' by the veterinary surgeon involved in your action, 50% of students attributed at least one virtue. The most frequently mentioned was compassion (11), followed by respect (8), honesty (7) and integrity (5) (Figure 5.6). Courage was the only virtue considered to not have been achieved. Other virtues identified that are not shown in the table were bravery, fidelity, fair-mindedness, justice and empathy (all n = 1).
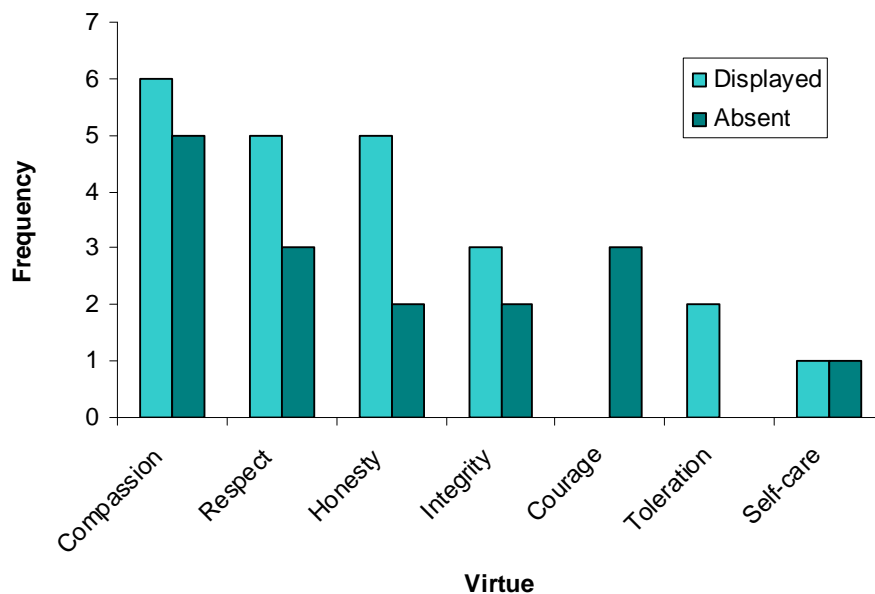
Figure 5.6: Frequencies of virtues considered by fourth year veterinary students to have been displayed by or absent in the consulting veterinarian

5.7.3   Student feedback

The student feedback survey was completed by six students, and only three students answered all the questions. It was therefore not considered worthwhile to analyse the results any further.

5.8   Discussion

5.8.1   Clinical AWAREs

Students tended to choose incidents that had a perceived negative impact on animal welfare. A similar trend was seen in the pre-clinical AWAREs and as discussed, this may be because these incidents had more impact, and were thus more memorable. It might be expected that negative incidents create a better opportunity for learning than positive ones. This has been found in medical students with regards to medical errors. Students reported that they learnt best from errors that caused severe harm and due to the associated emotional impact, they were more likely to be remembered (Fischer et al., 2006). Regardless of the reason, the results confirm that students often witness incidents that negatively impact animal welfare while on clinical EMS.

It was encouraging to see that nearly half of the students shared their feelings on their chosen incident with the attending veterinarian, which suggests that these students saw their mentor as approachable and possibly a confidante. It would have been interesting to find out whether sharing feelings with the veterinarian had helped the students resolve any concerns or anxieties. Feelings were also shared with fellow students. Although students do not view peers as a source of learning during clinical rotations (White & Chapman, 2007), they could be a source of support and peer discussion should be encouraged to help students cope with any negative experiences.

Most of the emotions students used to describe their experiences were negative but our results suggest that students were empathetic as empathy was the most commonly chosen positive emotion. Empathy has been reported to decrease in veterinary students as they progress from pre-clinical to clinical training years (Paul & Podberscek, 2000). In a study carried out in Norway, the author describes a spontaneous moral reaction of 'disgust and disbelief' on visiting the dissection area where there were rows of preserved, partly dissected dog cadavers, which veterinary students were working on (Druglitro, 2006). The findings from the study found that many of these students had the same initial reaction which dissipated through repeated exposure to such instances. Similar results were found in a study of empathy in farmers (Hills, 1995). It was shown that empathy was dulled by instrumentality, in that farmers managing intensive production systems were less empathetic towards battery hens than farmers from extensive management systems and empathy was lower in response to scenarios that involved farm animals than it was for scenarios that involved other animals. Veterinarians may employ coping strategies to emotionally distance themselves from the patient and their actions when carrying out particular practices, e.g. declawing (Atwood-Harvey, 2005). Although, emotional distancing was seen as a negative trait (the author concluded that practitioners should be challenging the accepted practice), adopting strategies in order to cope with emotionally distressing practices (often carried out by other people) may be beneficial. It may be equivalent to a mechanism described in medicine as 'detached concern' where sufficient detachment from the patient allows rational treatment to be applied and helps doctors maintain composure when witness to intense pain and suffering (Andre, 1992).

In the clinical AWAREs, it was often the action of the veterinarian that the students questioned, e.g. not using analgesic during castration of cattle. This was in contrast to the pre-clinical AWAREs where the majority of incidents did not involve a veterinarian and when they did, the veterinarian was normally seen as rescuing the situation (e.g. performing euthanasia on a suffering animal or performing veterinary treatment to rectify a problem). This highlights the importance of professional role-models during clinical EMS in shaping students' views of acceptable professional behaviour. Occurrences such as lack of analgesic use could have far reaching consequences for students' perceptions of professional behaviour. Hewson (2005) comments that if clinicians do not use analgesia in front of students, this encourages students to accept lower levels of animal welfare and not to challenge accepted practices. Although Hewson's study (2005) is concerned with veterinary schools, in the present study it is practising veterinary surgeons that are contributing to this effect and it is worth noting that universities have little control over

what students see on EMS or the actions of the veterinarians involved. Furthermore, using role-models to teach students could negatively impact students' learning if, as has been reported, clinicians do not welcome criticism or reflection on their approach to cases (Erde, 1997). In medicine, the influence of the so-called 'hidden curriculum' is thought to have a much greater effect on students' ethical development than any formal ethics teaching and clinical role models are thought to play a significant role within this (Hafferty & Franks, 1994).

The level of engagement with the AWARE was not dramatically different in the pre-clinical and clinical students, albeit these students were from different universities. This lends support to the argument that students of all levels in veterinary school can benefit from engaging in a reflective exercise that involves ethical theorising. No clinical student achieved less than a satisfactory rating indicating they need less support than pre-clinical students to achieve acceptable results. Perhaps most importantly, the results show that the AWARE is adaptable and can be successfully applied to clinical EMS scenarios. It also worked satisfactorily across species. Providing outlets, such as reflective tools, for students experiencing stressful or upsetting situations during veterinary training may assist with professional development.

One area where fourth year students surmounted that of first year students was in their consideration of future action. This part of the AWARE is designed to mimic the step of 'active experimentation' in Kolb's experiential learning cycle (Kolb, 1984). Fourth year students answered this question in much more depth than first year students, providing evidence that they are nearing readiness for professional practice. Interestingly, fourth year students were also more homogeneous in their choice of ethical frameworks with none identifying with contractarian or animal rights (though first year students also predominantly identified with the utilitarian framework). This may indicate that utilitarian or hybrid views are most amenable to the work of a veterinary surgeon, and that contractarian and animal rights views are incongruent with farm animal veterinary work. Narrowing in the range of moral reasoning scores of veterinary students as they progress through veterinary school has also been found (Self et al., 1991; Self et al., 1993b) indicating that veterinary school may have a homogenising effect where students want to conform to those around them and so become similar in the way they address moral problems.

5.8.2   ROPE

5.8.2.1   RCVS's ten guiding principles

Although students were given the option to choose a clinical situation which had ethical implications for the veterinary surgeon or other people, all but two students chose to reflect on a situation that involved an animal. This suggests that students are animal focused. Given that the highest proportion of students reported that the veterinarians in question contravened Principle 1 (animal welfare being a vet's first consideration), this suggests that animal welfare is not given priority in practice. In addition, over half of students also believed that the practitioner failed to maintain a good relationship with the client (or their colleagues). Thus, it is not a case of one principle overriding another, and suggests there are numerous factors at play in complex situations. Veterinary surgeons satisfied their ethical obligations in only a small number of incidents. Although veterinarians may strive to meet ethical obligations it is often extremely difficult (Fogelberg & Farnsworth, 2009), which was acknowledged by several students (evidenced by their responses to the Round Up section). It should also be noted that the results discussed in this section, and the subsequent two sections, are based on students' perceptions of veterinarians' professional behaviour and therefore, the results should be interpreted with caution.

The RCVS's Guide to Professional Conduct (2010a) has no statutory basis and as mentioned, interpretation of the principles is to an extent subjective (e.g. how much treatment constitutes over treatment). The cases reported by students emphasise that individual practitioners act according to their personal views. These determine the type of treatment given, influenced, for example, by their views of the moral value of animals, wider ethical perspective or cultural background. Individuality in treatment has previously been highlighted as a concern in ethical dilemmas (May, 2011, Morgan, 2009). Just as veterinarians may differ in whether they describe a situation as an ethical issue or not, students may perceive problems not identified by the practitioner. The practitioner is a professional role model and much of what students learn on EMS will be dependent on the mentor(s) they see practice with (Taylor & Barnes, 1998a). Combining good role models with reflective activity has been said to be influential in developing medical professionalism (Wald et al., 2009) and the same influence would be expected in veterinary medicine. At some point veterinary students will have to start to take these decisions for themselves, so reflecting on how different veterinarians prioritise their obligations through an analysis of the RCVS's guiding principles should be useful.

5.8.2.2 Bioethical principles

The majority of students were able to understand and apply all four of the bioethical principles to the critical incident they described. However, more students understood the concept of the principle than were able to apply it correctly to the incident they described. The inability to apply the principles is a concern that has been raised in relation to medical students (Johnston, 2011). In this study, this inability was particularly evident with regards to *beneficence* where 97% of students understood the principle but only 59% managed to apply it appropriately to their scenario. One reason *beneficence* may be more difficult to apply is that it involves balancing potential harms against the benefits (as in utilitarianism) and both of these are hard to quantify, and consequences are often challenging to predict (Macklin, 2003).

Though these principles have been successful elsewhere, they have not been applied in veterinary medicine. Several difficulties arise when applying them to veterinary scenarios. Firstly, the animal patient is not autonomous, so in this exercise *respect for autonomy* was granted to the client (the animal's owner/carer). The fact that the animal patient does not have autonomy means that *respect for autonomy* is possibly superfluous in veterinary medicine. However, the autonomy of the client is still something that should be considered as they have control over what happens to their animal. Including an alternative principle that embodies respect for the animal patient such as that suggested by Rutgers (2011) of *respect for animal integrity* may be more applicable. Secondly, the principle of *justice,* which refers to treating one patient as you would another, is complex when dealing with animals because of species differences and the differing moral status afforded to animals. For example, it may be seen as beneficial not to treat a wild animal, whereas it may be acceptable to inflict harm on a laboratory rat (with the purpose of a greater good). There is the additional complication that as many people assign animals' moral values using the socio-zoological scale that animals that have close relationships with humans will be afforded higher moral value, for example, dogs, whereas animals that do not have this close relationship may be seen as of lower moral value, for example, reptiles. The limited number of students that understood *justice* may reflect these challenges.

In the incidents described by the students, the principle which was most often satisfied was *respect for autonomy*. In human medicine, *respect for autonomy* is often prioritised

(Gillon, 2003). However, in the context of veterinary practice, the autonomy relates to a proxy (the owner), and has taken precedence in many of the scenarios described. This may not be beneficial for the animal patient, especially in cases where the client's wants are not in the best interests of the animal. Ebbesen & Pedersen (2007) suggest that when *respect for autonomy* is not relevant (e.g. if the patient is not competent, and in the case of animals), then *beneficence* and *non-maleficence* should take priority. The results of this study do not support this (though these are based on students' perceptions). One possible reason that client autonomy might take precedence is that it relieves the veterinary surgeon of decision making. If it was the client's decision it may make it easier for the veterinary surgeon to justify the action and lessen their guilt (Frommer and Arluke, 1999).

5.8.2.3 Virtue ethics

The virtues were poorly understood and half of the students failed to identify any virtues. The use of virtue ethics differed from that of the other two frameworks in that the virtues are not prescribed, and therefore using this framework requires more spontaneous thought by students. Veterinary students are used to right and wrong answers (Fogelberg & Farnsworth, 2009) so this is likely to have contributed to the inferior response in this part of the exercise. It can also be difficult to identify someone's motivation (a key concept of virtue ethics) (Erde, 1997; Jansen, 2000) and this may also have made this framework more difficult to apply.

Compassion was the most commonly identified virtue in this study. The veterinary student population is heavily skewed towards females so the theory of Ethics of Care, a division of virtue ethics, could be of relevance (Athanassoulis, 2004). According to this theory, women tend to reason using predominantly feminine traits such as caring, whereas men tend to rely on justice and autonomy in their reasoning on ethical dilemmas. Theorists argue that virtues, such as compassion, that are favoured by women should be given more emphasis.

Although results using this framework were not as successful as the others, virtue ethics should still be considered an important part of veterinary ethics. It is important for veterinarians to maintain a professional demeanour and this is where the virtues can add weight. Campbell (2003) recommends virtue ethics for encouraging patient-centred medical ethics, and this could as easily apply in veterinary medicine. One argument against

using virtue ethics is that it was created in a time of small, homogeneous communities where people looked to superiors to lead them in their moral behaviour and according to Jansen (2000) is not as relevant in today's pluralistic society. However, the veterinary profession is a small community where most members could be expected to have similar moral notions, therefore it may be highly applicable for maintaining standards of behaviour. In future exercises, providing specific virtues for students to comment on may help engagement with the virtue ethics framework. Virtues suggested as relevant to practising medicine: trustworthiness, integrity, discernment, compassion, and conscientiousness (Beauchamp & Childress, 2009), may provide an alternative structure for applying virtue ethics in veterinary medicine.

5.9   Conclusions

The findings from this chapter show that the format and concepts introduced in the pre-clinical AWARE can be successfully applied in clinical situations and the AWARE works well in combination with an animal welfare teaching package. Students were able to choose relevant issues to reflect on in both the clinical AWARE and the ROPE, and the format worked across species. The ROPE introduced three frameworks relating to professional ethics, and of these, students found the RCVS's ten guiding principles easiest to apply. Students also applied the four bioethical principles well but these principles may not be as applicable to veterinary medicine as they are to human medicine. Virtue ethics was the most poorly understood of the three frameworks but students may benefit from the provision of example virtues to relate professional behaviours to. Further analysis of the written content as well as student feedback would be required to confirm that these two clinical learning tools promote reflection on ethical issues. Nevertheless, the results suggest that both the ROPE and the clinical AWARE can be easily integrated into a professional studies course within a veterinary curriculum, that they need little formal instruction to accompany them and they are exercises with which students readily engage.

Chapter 6 - Moral reasoning in veterinary surgeons

6.1   Introduction

Veterinarians regularly have to make difficult ethical decisions that arise because the interests of animal and client often conflict, for example when the client cannot, or does not want to, pay for optimal or continued treatment. A recent survey of UK veterinarians revealed that ethical dilemmas such as "convenience" euthanasia of healthy animals, excessive treatment requested by the owner and financial limitations to treatment were considered by veterinarians to be highly stressful and 94% of respondents faced at least one ethical dilemma a week (Batchelor & McKeegan, 2012). Given that veterinarians face ethical dilemmas on such a regular basis, the ability to come to reasoned, defensible decisions is of great importance. To aid in this decision making process, and to ensure good quality of care for animals, veterinarians require good moral reasoning skills. Moral reasoning is the process by which people determine that a course of action is either morally right or wrong (Rest, 1983). Currently, little is known about the moral reasoning abilities of qualified veterinarians. One study in the USA compared small and large animal practitioners' moral reasoning abilities using the Defining Issues Test (DIT) (Self et al., 1988). The results showed that there were no differences in their moral reasoning abilities and that the mean scores were lower than would be expected according to the norms developed from DIT data (Rest, 1993). Moral reasoning abilities of veterinary surgeons in the UK have never been systematically measured. Studies carried out on veterinary students in the USA found that veterinary education did not improve moral reasoning abilities to the level expected of a professional degree (Self et al., 1991; Self et al., 1996). This deficiency could lead to substandard levels of care for animals and clients, and increased anxiety and stress in practising veterinarians. It is therefore an area that merits investigation.

In this study the aim was to collect preliminary data on the moral reasoning abilities of veterinary surgeons using a well-established approach, the DIT (version 2). Another aim was to identify any differences in moral reasoning among veterinarians based on demographic variables, place of qualification, clinical experience and area of practice.

6.2   Methods

6.2.1   Test allocation and administration

The study was approved by the University of Glasgow's Veterinary School Ethics and Welfare Committee. The DIT-2 was used to assess the participants' moral reasoning ability. For information, on the test, its structure and scoring methods see Chapter 2.

Participants for this study were recruited in two batches and consisted of three groups: practising veterinarians from around the UK (veterinarians that see first opinion practice), academic veterinarians (veterinarians who teach and/or work at a veterinary school) and members of the public. Data on veterinarians were collected using convenience sampling. A purposive sample of members of the public, which aimed to represent a wide range of ages and experiences, acted as a control group. The first group of participants were tested as part of a veterinary undergraduate project at the University of Glasgow in the summer of 2011 and all participants were approached in person. The participants were each presented with a pack that contained: a DIT-2 instruction booklet and answer sheet, a consent form, additional questions on demographic information, a pencil (the DIT is scored using an optical scanner so must be completed in pencil) and a short introduction to the study including contact details if assistance was needed. Tests were collected in person and checked in order to reduce purge rates. The second group of participants, who were all veterinarians, were recruited via email and were asked to complete an online version of the DIT-2. All but one academic veterinarian worked at the University of Glasgow. To avoid biasing the responses and possibly making veterinarians feel judged, participants were not told that the aim of the DIT-2 was to assess moral reasoning, but that the questionnaire was looking at people's responses to various social issues. As responses were anonymous, a five digit ID number starting with one, two or three was added to each DIT-2 to identify practising veterinarians, veterinary academics and members of the public, respectively.

Age and gender details were collected for all participants. In addition, veterinarians were asked how many years they had been in practice, at which university they obtained their veterinary degree, the area of practice they worked in (e.g. small animal, farm animal, equine, mixed), and the approximate percentage of time spent in each area. Academics were also asked how many years they had been away from first opinion practice. Members

of the public were asked to indicate their highest level of education from a choice of GCSE/O-level/Standard Grade or equivalent, AS-A level/Highers or equivalent, Higher Education (with details) or other formal education (with details).

The completed DIT-2s were sent to the University of Alabama for scoring. The scores provided are explained in detail in Chapter 2, but include P scores (percentage of respondents answers that use post-conventional moral reasoning), N2 scores (includes the percentage of the respondents answers that use post-conventional moral reasoning but also takes into account the prioritising of post-conventional over pre-conventional items), and Type indicators (which indicate the level of moral reasoning each participant used most in their responses). Type indicators are measured on a scale of one to seven, or can be categorised into pre-conventional (1 and 2), conventional (3, 4, and 5) and post-conventional (6 and 7).

6.2.2   Statistical analysis

All results met parametric assumptions and the data were analysed using Minitab 16 statistical software (Minitab Inc., USA) and SPSS (IBM, USA). General linear models (GLMs), two sample t-tests and Pearson's correlations were carried out in Minitab 16. GLMs were used to investigate whether there were any differences in P or N2 scores between the three groups (practising veterinarians, academic veterinarians and members of the public) and between veterinarians in different areas of practice (small animal, large animal (farm/equine) or mixed). Two sample t-tests were used to investigate any effects of gender or region of study on P or N2 scores. The relationship between P and N2 scores and years in practice, age and years out of first opinion practice (for academic veterinarians) were explored using Pearson's correlations. SPSS was used to perform chi-squared analysis on the proportion of each group assigned to the three moral reasoning stages.

6.3 Results

6.3.1 Demographic information

In total 98 people completed the DIT-2: 65 veterinary surgeons (38 practising veterinarians and 27 academic veterinarians) and 33 members of the public (20 females and 13 males). Of the 38 practising veterinarians, 15 were female and 23 were male. There were 10 female academic veterinarians and 17 male academic veterinarians. There was a wide age range in all groups (18-24 to 50+), but academic veterinarians tended to be older with none under 30. Practising veterinarians experience ranged from 1-2 years to 25+ years whereas all academics had 6 or more years in practice. Of the members of the public sampled, 64% held a degree (higher than the national average).

6.3.2 P and N2 scores

None of the 98 responses were purged. The mean P score for each of the three groups was 38.2 (± 2.2) for practising veterinarians, 43.3 (± 2.5) for academic veterinarians and 31.8 (± 2.5) for members of the public (Figure 5.1). The mean N2 score for each of the three groups was 34.7 (± 2.3) for practising veterinarians, 40.0 (± 2.5) for academic veterinarians and 27.2 (± 2.9) for members of the public (Figure 6.1).
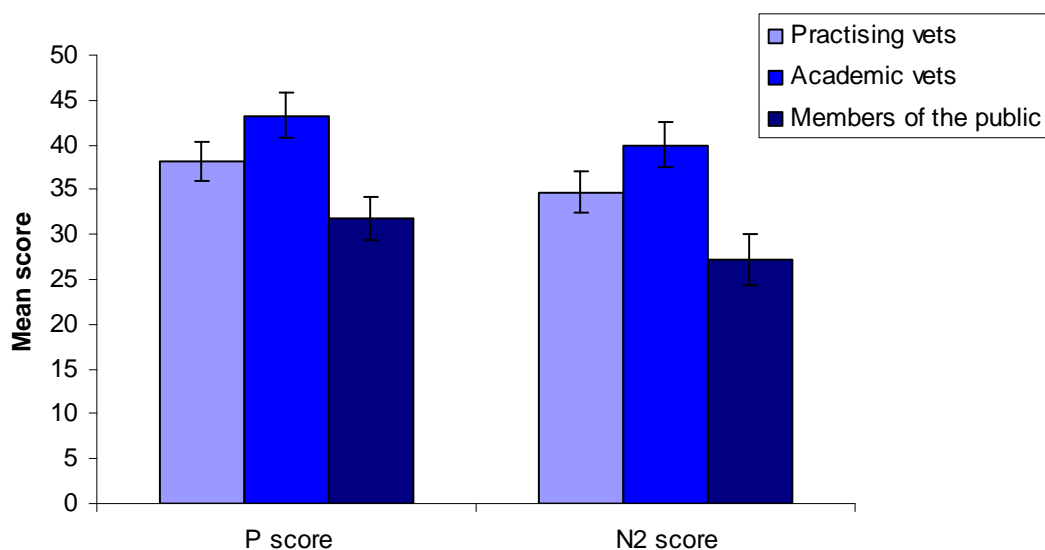
Figure 6.1: Mean P and N2 scores for practising veterinarians, academic veterinarians and members of the public

The P scores of practising veterinarians ranged from 12 to 58, for academic veterinarians from 14 to 64 and for members of the public from 6 to 76. Both practising veterinarians and members of the public had negative minimum N2 scores, which were -2.7 and -2.6 respectively. The lowest score for academic veterinarians was 15.3. The maximum N2 score for practising veterinarians was 58.1, for academic veterinarians was 61.8 and for the public was 71.5. P score differed between the groups (GLM, p = 0.007), as did N2 scores (GLM, p = 0.004), with academic veterinarians scoring significantly higher than members of the public (Tukey test). There was no difference between P scores or N2 scores of practising veterinarians and members of the public, or practising and academic veterinarians.

No differences were seen between the P and N2 scores of males and females across all three groups. When looking solely at veterinarians, no differences between P and N2 scores were found between males and females. However, female veterinary academics had higher P scores than their male counterparts (two sample t-test, p = 0.008) and higher N2 scores (two-sample t-test, p = 0.037). This difference was not seen in practising veterinarians.

Area of practice of first opinion veterinarians (i.e. small animal (n = 16), large animal (farm/equine) (n = 8) or mixed (n = 15)) had no effect on P or N2 scores. Likewise, no difference was seen in moral reasoning scores between veterinarians who qualified in the UK and in the rest of the world. No correlation was seen between years in practice and P or N2 scores, nor between age and P or N2 scores. In veterinary academics, no correlation was found between years out of first opinion practice and P and N2 scores, though the relationship was negative and approached significance for N2 scores (N2 score: Pearson correlation = -0.39, p = 0.07).

6.3.3 Type indicators

The majority of practising and academic veterinarians relied on post-conventional moral reasoning (Figure 6.2). However, 26% of practising and 11% of academic veterinarians relied on pre-conventional moral reasoning. The largest percentage of members of the public relied on conventional level moral reasoning.

Practising vets

Academic Vets

Members of the public
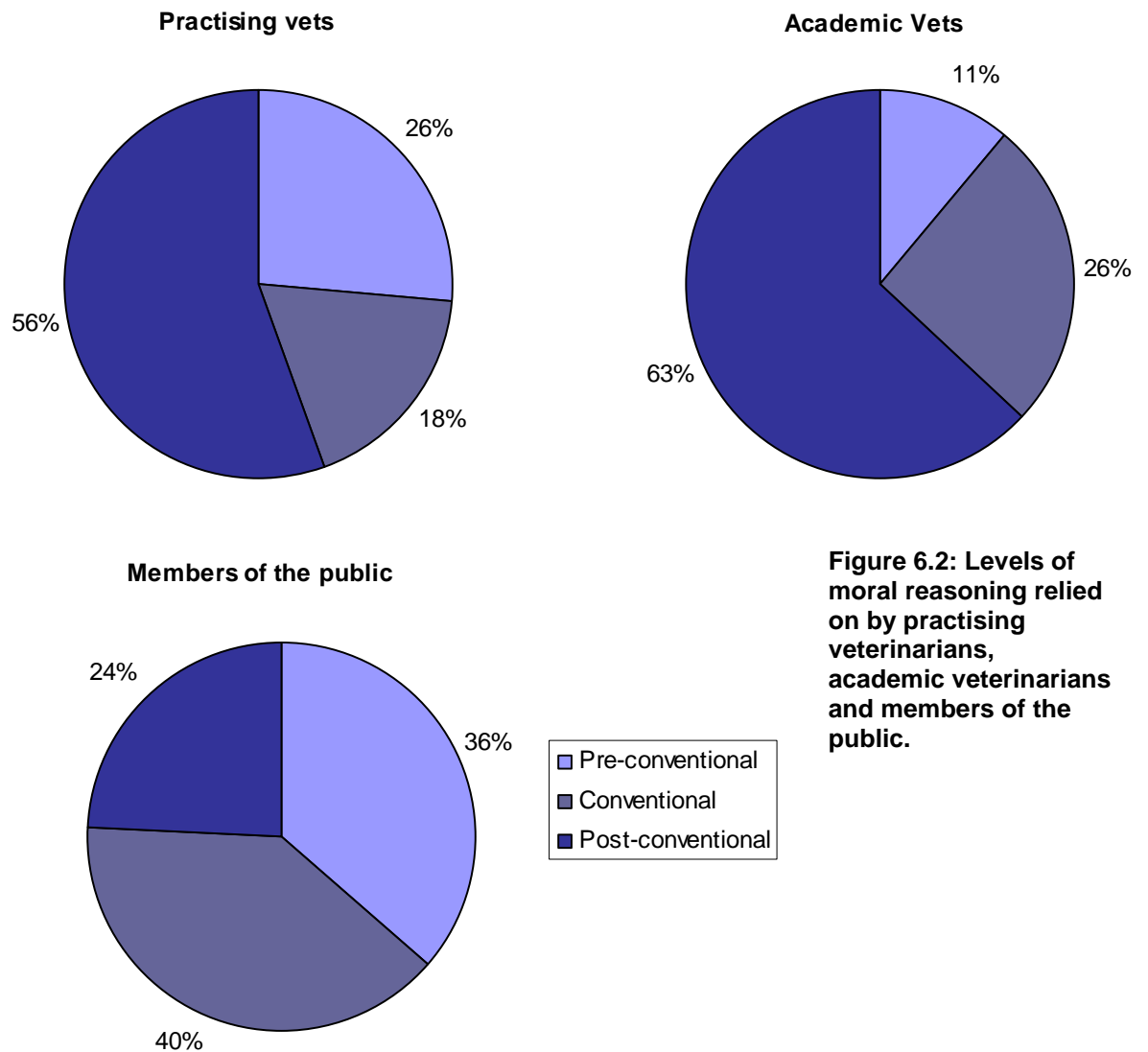
Figure 6.2: Levels of moral reasoning relied on by practising veterinarians, academic veterinarians and members of the public.

Legend:
- Pre-conventional
- Conventional
- Post-conventional

A chi-square test revealed that pre-conventional level moral reasoning was relied on by fewer academic veterinarians than members of the public and that post-conventional level moral reasoning was relied on by a higher proportion of both practising and academic veterinarians than members of the public ($p = 0.016$). There was no difference in the proportion of practising veterinarians and members of the public that relied on pre-conventional moral reasoning. The proportions of conventional moral reasoners were similar in all three groups. Results for individual Type indicators are given in Table 6.1).

Type	Practising veterinarians	Academic veterinarians	Members of the public
1	3	0	9
2	24	11	27
3	8	15	24
4	5	7	9
5	5	4	6
6	26	41	6
7	29	22	18

Table 6.1: Percentage of practising veterinarians, academic veterinarians and members of the public displaying particular Types in response to the Defining Issues Test

6.4   Discussion

This is the first study to examine moral reasoning ability in veterinary surgeons in the UK. The results provide an initial insight into this professional group, as well as information on the moral reasoning abilities of a sample of the UK public. Veterinary academics, in this study, had greater moral reasoning abilities than members of the public unlike practising veterinarians. Members of the public most often relied on conventional moral reasoning as expected. Conventional level reasoning is the societal norm (Hartwell, 1995) so most competent adults would be expected to score at this level of moral reasoning. The higher scores of academics are most likely due to their higher level of education, most having attained a doctorate, as there is a strong positive correlation between further education and moral reasoning ability (King & Mayhew, 2002). It may also be as a result of a working environment where the free flow of ideas and critical thinking are encouraged through discussion groups such as journal clubs and the diagnosis and treatment of complex cases. The findings are limited, however, by the fact that all but one of the academic veterinarians sampled worked at one institution and that the sample represents a very small proportion of qualified veterinarians within the UK. Further study of veterinary academics at other institutions and larger numbers of practising veterinarians would be required in order to strengthen these results.

Gender has been shown to have had an influence on moral reasoning scores in the past with female veterinary students performing statistically better than males (Self et al., 1996). Although this result was only observed in veterinary academics, it supports previous findings that educational level is much more powerful than gender in explaining differences in DIT scores (Thoma, 1986) and the difference in scores between the sexes increases the higher the level of education (Bebeau & Thoma, 2003). Previous studies have found that veterinary medical education can be detrimental to ethical development (Self et al., 1991; Self et al., 1996) with students not making the expected gains by the end of their course. As academic veterinarians' scores were higher than those of the public, this suggests that further education within an academic arena cancels out that detrimental effect.

The finding that practising veterinarians did not score higher than members of the public indicates that despite having achieved a professional qualification, the moral reasoning skills of practising veterinarians may be insufficient to meet the demands of their ethically challenging job. Although the majority relied on post-conventional level moral reasoning, 26% relied on pre-conventional moral reasoning. Practising veterinarians could reasonably be expected to have higher moral reasoning skills than their clients so that they are in a position to offer sound justifications for recommending particular courses of action, and are not unduly influenced by their client's interests. Veterinarians should be able to defend their reasoning and discuss this confidently with their clients in order to achieve satisfactory outcomes. Weak moral reasoning skills could also have implications for animal welfare, if the veterinarian is not able to recognise, or advocate for, a course of action which is in the animal's interests. It has also been found in both paediatric residents (Sheehan et al., 1980) and physiotherapy students (Sisola, 1995) that those with low levels of ethical reasoning seldom performed clinically to the highest level and there is no reason this would be different in veterinarians. In addition to the impact on clients and animal patients, the wellbeing of veterinarians themselves could be compromised if they are not able to cope with ethical decision making. A poll in the UK reported that over 80% of veterinary surgeons thought that veterinary medicine was a stressful occupation (Robinson & Hooker, 2006). An inability to deal with difficult ethical decisions (as suggested by the lower ethical reasoning scores) could lead to stress or burnout (Platt et al., 2010), and there is a known heightened risk of suicide in the profession (Mellanby, 2005; Bartram & Baldwin, 2010). One reason that ethical dilemmas may contribute to stress experienced by veterinarians, and that practising veterinarians had lower moral reasoning scores than expected, is that many have not been given training on how to make difficult ethical

decisions (Batchelor & McKeegan, 2012). Teaching of ethics and ethical reasoning has only recently been introduced to veterinary curricula. It might be expected that increased experience would reduce the stress associated with ethical dilemmas but that is not the case. Likewise, increased years of experience did not improve moral reasoning scores. This indicates that moral reasoning is not something that is easily self-taught or automatically learned. The creation of teaching packages to support and guide qualified veterinarians in ethical decision making would be constructive.

Importantly, these results highlight a lack of consistency in the moral reasoning abilities of practising veterinarians, with some showing higher skill levels than others. The link between clinical performance and ethical reasoning found in other professions (Sheehan et al., 1980, Sisola, 1995) indicates that this lack of consistency will have a direct impact on the animals in their care, with some likely to receive better care than others. To overcome this challenge, the veterinary profession would benefit from introducing a minimum acceptable standard of ethical reasoning that represents a fitness to practice. This could be recorded as a 'Day 1 skill', though assessment of it may be troublesome. Furthermore, on closer examination of these results, it is apparent that the most common Type indicator for practising veterinarians outside of post-conventional moral reasoning (6 and 7) was Type 2 (pre-conventional). Pre-conventional moral reasoning is the most basic form and reflects a deficiency in these professionals. This suggests that either veterinary education and/or the nature of veterinary practice causes some practitioners to revert to a simplistic form of reasoning. There has been a suggestion that the repetition of stressful events such as euthanising animals could lead to 'learned helplessness' on the part of veterinarians (Fogle & Abrahamson, 1990), which may explain why some veterinarians revert to pre-conventional level moral reasoning as they feel that challenging the actions of others is futile. Similarly, bowing to authority or following rules, could lessen the responsibility for decision making felt by veterinarians, making it easier to cope (Atwood-Harvey, 2005). Moreover, there may be aspects of the culture of veterinary medical education that encourage acquiescence, as has been recognised in medical training (Hafferty & Franks, 1994; Hren et al., 2011).

The finding that the region where veterinarians qualified had no effect on their moral reasoning scores suggests that, in relation to moral reasoning, UK veterinary education is no worse than elsewhere in the world, but in any case, it is an area of the curriculum that could be improved worldwide. Ethics has only recently become a taught part of the veterinary curriculum (and in some countries it has yet to become so). This means that

teaching methods are not well established, research on this area is in its infancy and teaching staff may not be appropriately equipped to provide relevant teaching material. Research and teaching methods are more widely developed in other professions such as nursing and medicine. Having said that, it is difficult to assess how veterinarians' moral reasoning abilities compare to those of other professional groups as data on moral reasoning abilities of practising professionals are sparse (though there is a plethora of studies on students of these same professions (Bebeau & Thoma, 1994; Duckett et al., 1997; Latif, 2000; Hren et al., 2011)). From the information that is available, it appears that practising veterinarians in this study score similarly to physiotherapists (Swisher et al., 2010), pharmacists (Latif & Berger, 1999) and practising veterinarians (Self et al., 1988) in the USA but lower than the norms generated by Rest (1993) for graduate students. All these professional groups scored lower on the DIT than expected and indicates that their education has not had the desired effect of improving their ethical development above that of the general population.

As has been mentioned previously (Chapters 4), the DIT uses human social issues to measure moral reasoning ability which may not provide a true reflection of a veterinarian's ability to reason morally in veterinary dilemmas even though it appears their moral reasoning abilities may be lacking. Interestingly, though the members of the public questioned in this study were on average more highly educated than might be expected in a wider sample of the public, their mean moral reasoning score was lower than the norm proposed by Rest (1993) for adults in the general population. This could be indicative that British people do not score as highly on the DIT as Americans do (it is an American test) or that moral reasoning as a skill is declining. It would be interesting to gather data using the DIT-2 for other practising professionals, especially in the UK, to provide a comprehensive account of their moral reasoning abilities in relation to veterinarians, and to in turn address the question of whether veterinary education is alone in failing to improve ethical development sufficiently.

6.5   Conclusion

These data provide an insight into the moral reasoning levels of a small sample of UK veterinary surgeons and members of the British public. The finding that practising veterinarians did not achieve higher moral reasoning scores than members of the public

and over a quarter of them relied on pre-conventional moral reasoning is concerning. The indication is that veterinary education has not enhanced moral development in the way expected of a professional degree, and as such there are implications for animal welfare, client services and veterinary wellbeing. A larger scale study would be required to confirm this. There also appears to be noticeable inconsistency in the ability of qualified veterinarians to solve ethical problems. These results highlight the need for practising veterinarians to be offered Continued Professional Development training in ethical skills.

Chapter 7 – General discussion

This work represents the first attempt to develop and validate a reflective learning tool for veterinary ethics. The Animal Welfare Associated Reflective Exercise (AWARE) was designed to promote life-long learning skills by employing independent learning approaches such as self-directed learning, experiential learning and personal reflection (Plack et al., 2007; Raidal & Volet, 2009). By creating a guided reflection that focused on animal welfare issues witnessed by veterinary students during pre-clinical extra mural study (PC-EMS), increased levels of reflection and ethically relevant reflective content were generated relative to that of unstructured reflections that had previously been in place as post-EMS reports. This novel approach was viewed positively by the majority of students and improved their self-reported competence on many related skills such as their ability to recognise animal welfare and ethical issues, to respect others viewpoints and to reflect on their experiences. The qualitative content provided evidence of improved ethical awareness, a concept that has never previously been defined or measured in relation to veterinary medicine. Another strength of this approach is that students at different stages of training and experience are able to engage with the AWARE to an acceptable level. Collectively, the results suggest that allowing students the freedom to explore their individual experiences provided them with a gentle introduction to independent learning which may be less daunting than full-scale problem based learning exercises. AWARE has the potential to improve, both, learning outcomes in veterinary ethics and alignment between students' experiences of EMS placements and the taught course (Taylor & Barnes, 1998a). In addition, student reflections generated by AWAREs provide interesting information on animal welfare issues encountered by veterinary students during PC-EMS, which have never been formally recorded before.

The AWARE teaching package now forms part of a PC-EMS CAL package, Welfare and Ethics Awareness via Experience (WEAVE). WEAVE is the only computer-based welfare and ethics teaching package designed specifically to aid welfare and ethics teaching within UK veterinary schools and is currently in place at the Universities of Glasgow and Bristol. As well as providing ethical training for pre-clinical students, the AWARE was also adapted successfully for use in clinical situations. The Reflection on Professional Ethics (ROPE), which focused on another important element of veterinary ethics, professionalism, was developed. Professionalism is an area of veterinary ethics that has

been neglected (May, 2011) and this tool is the first of its kind to be created. The creation of a reflective tool which can be easily integrated into an EMS portfolio and needs little in the way of introduction could be an ideal addition to a curriculum that is moving towards further adoption of independent learning approaches.

This is also the first time that components of moral development have been measured in a population of UK veterinary students. These results provide the first insight into the moral reasoning ability of UK veterinary students and qualified veterinarians in the UK, as well as information on levels of ethical sensitivity in UK veterinary students. By using two non subject-specific measures, the Test for Ethical Sensitivity in Science (TESS) (Clarkeburn, 2002) and the Defining Issues Test (DIT) (Rest et al., 1974), the findings are easily comparable with those of other UK practising professionals.

The main findings of the research are:

- The AWARE increased ethically relevant reflective content when compared to unstructured reflections previously used as post EMS reports.
- The structured format of the students' experiences are likely to be the main reasons for the success of the reflective instrument.
- Pre-clinical students viewed the AWARE positively and engaged well with it.
- The concept of a structured, reflective tool was easily adaptable to clinical situations involving both animal welfare and professional ethics situations.
- The AWARE did not improve ethical sensitivity in first year veterinary students as measured by the TESS or moral reasoning as measured by the DIT.
- Moral reasoning levels of entering veterinary students are in the same range as US college students, according to the DIT norms, but moral reasoning levels of graduating veterinary students are no higher than those of first year veterinary students.
- Practising veterinarians' moral reasoning scores were not higher than those of members of the public whereas academic veterinarians' scores were.
- A notable proportion of clinical veterinary students and qualified veterinarians rely on pre-conventional level moral reasoning to make moral decisions; a simplistic level that is expected to be rejected before adolescence.

7.1   Use of a novel, reflective approach

7.1.1   Is reflection a learning method suited to veterinary students?

Little time is spent encouraging ethical development within veterinary curricula and inclusion of ethics as a stand-alone subject has only recently been implemented in many veterinary schools. Few approaches to teaching ethics to veterinary students have been described (Self et al., 1995; Hanlon, 2005; Rutgers, 2011) and reflection as a mode of improving ethical development has not been a key element. In the present study, a novel, reflective approach was used in an attempt to improve ethical development in pre-clinical veterinary students by asking them to reflect on an animal welfare related incident they witnessed during PC-EMS. The premise of this approach, as in other ethics teaching within UK veterinary schools, was to encourage a pluralistic approach to ethics where there is an acceptance of others' views and an awareness of a variety of perspectives together with their strengths and weaknesses. Veterinary students are more familiar with subjects that revolve around right and wrong answers (Raidal & Volet, 2009) and this dualistic perception of learning is not amenable to a philosophical subject. Therefore, it is likely that students who, until now, have relied on seeking and acquiring correct answers will need clear guidance in order to engage with and feel comfortable with a subject that focuses on reasoning rather than correct answers. The structure of the AWARE was based on Significant Event Analysis (SEA), a method which helps encourage inexperienced reflectors to gain more from a reflective assignment (Donaghy & Morss, 2007), and one that proved effective in this exercise. Unlike most studies that have used a structured format to encourage reflection with a small number of prompts, often in the form of headings (Donaghy & Morss, 2000; Bowie et al., 2004; Mori et al., 2008), the AWARE used numerous prompts with a narrow focus to facilitate key elements of ethical reflection. Some may consider the use of numerous prompts as too prescriptive but for inexperienced students this may have been crucial in achieving the intended learning outcomes. Moreover, other studies that used fewer prompts, did not tend to support the more advanced levels of reflection, such as dialogic and critical reflection. The level of guidance given, in the form of prompts, could easily be reduced as students experience of reflection increases.

Much has been made in the literature of preferred learning styles and several models have been developed (Honey & Mumford, 1986; Felder & Silverman, 1988; Tait & Entwistle,

1996). A study of 150 veterinary students at North Carolina State University used the Inventory of Learning Styles (ILS) created by Felder & Silverman (1988) and found that 57% of veterinary students had a preference for active learning whereas 43% preferred reflective learning. However, the majority were balanced on the active-reflective scale (59%) with 20% having a moderately strong preference for one or the other (Neel & Grindem, 2010). Active learners process information most effectively during for example physical activity or group discussion, whereas reflective learners prefer to have time to think about the information provided (Felder & Silverman, 1988). The active-reflective dimension on the ILS is equivalent to the two opposing elements of Kolb's (1984) learning cycle, active experimentation and reflective observation (see Figure 1.1). The learning styles of veterinary students in different institutions may not be directly transferable. However, based on the results of Neel & Grindam's study (2010), the inference is that as the AWARE has elements of both active and reflective learning (a dimension on which the majority of students are balanced), students should cope well with completing it. As veterinary students appear to favour active over reflective learning, including time for discussion of their experiences on PC-EMS could benefit those who prefer to learn actively. If the student is not reflective in nature, reflection should be introduced early on to familiarise them with the concept and strengthen their ability, with the aim of attaining a reasonable competency level by the time they graduate. Although students can begin to learn in a non-preferred way (Felder & Spurlin, 2005), it is interesting to speculate whether the few students that did not engage well with the AWARE had strong preferences for learning styles not conducive to reflection. Asking students to complete the ILS (or a similar test) on entry to veterinary school could help to identify those students who may require more assistance in engaging in reflection, as well as providing valuable information for the teaching of other subjects.

7.1.2   Inclusion of ethical frameworks

Ethical frameworks help to make ethical thought consistent by providing a frame of reference and by doing so, arguments for and against actions are more logical and thus, defensible. They provide an objective tool to resolve issues that often incite emotion. Their structural nature may also make ethics more accessible to science students who are familiar with fact-based subjects. Three frameworks were used in the AWARE (utilitarian, contractarian and animal rights/deontology) to encourage students to evaluate their incident

in relation to ethical viewpoints. The number of frameworks included was limited to three as a pragmatic approach to limit complexity and the three chosen frameworks were seen as having immediate relevance to both veterinary and farming practice. These frameworks also provide different perspectives on the moral status of animals. There were alternative animal ethics frameworks that could have been included. The relational view and the respect for nature view do not regard sentience as relevant in guiding ethically acceptable actions, and focus on other factors. The respect for nature view places emphasis on the moral value of a species as a whole and the protection of its integrity. This has limited relevance in a farm-based veterinary ethics teaching tool and is more relevant in relation to conservation studies and the treatment and care of wild animals. The relational view, considers the closeness of the human-animal relationship as defining our duties towards animals, and morally acceptable behaviour is determined by individual relationships with particular animals, or more generally, societial relationships with a particular species of animal. In farm animal practice, contractarian or utilitarian views are commonly used to defend actions but animal rights and the relational framework could be argued to be more relevant to ethical issues concerning companion animals (Sandoe & Christiansen, 2008). For example, the relationship the client has with their animal often defines the treatment they want afforded to it and in animal agriculture, farmers do not tend to have individual relationships with their animals. That is not to say that the relational view does not have applicability in farming practice. On the contrary, it could be used to evaluate whether farm animals' needs are met, it could be used as the basis of discussion on the difficulty of maintaining individual relationships in intensive production systems and in support for change in these systems (Sandoe & Christiansen, 2008) and it could also be used to raise awareness of why it may be defendable to offer varying levels of veterinary treatment to animals of different species or utility. Its inclusion in the AWARE could have prompted students on PC-EMS to consider the lack of relationship with individuals and how that impacts our duties towards farm animals, or to compare the treatment of different species, for example, sheep and horses, where the latter are regarded as companions in most cases in the UK. Nevertheless, the three frameworks used served as a straightforward introduction to animal ethics for first year veterinary students and widened their appreciation of less conventional viewpoints.

Different ethical frameworks were used in the professional ethics exercise; including the bioethical prinicples (Beauchamp & Childress, 1974) and virtue ethics. Three of the bioethical principles, *beneficence, non-maleficence* and *justice* could easily have been incorporated into the AWARE but the fourth principle, *respect for autonomy*, would have

had less relevance on PC-EMS placements as no professional interaction takes place and it is primarily the farmer that makes the decisions around care. Considering the animal welfare impact of a particular incident could be portrayed in terms of *beneficence* and *non-maleficence* and the principle of *justice* could have prompted consideration of issues around equality of treatment; something that differs dependent on the species or perceived value of the animal involved (e.g. sheep bred for meat vs pedigree sheep for breeding). However, this framework was not designed to aid in decisions between humans and animal patients but is based on principles of human medicine, making the principles less useful for shaping solutions to veterinary scenarios. As suggested in previous chapters, to make these principles more applicable to situations involving animals, the principle of *respect for autonomy* could be replaced with one such as *animal integrity* (Rutgers, 2011), and this could have encouraged students to think about farm animals' perceived moral worth and the moral implications of actions such as mutilations.

Virtue ethics is perhaps more relevant to professional ethics than animal welfare ethics but it could have been integrated into the AWARE, for example, in conjunction with the question 'why do you think that action was taken?'. This could assist students in evaluating the farmer's actions, for example, whether students felt the farmer displayed particular attributes. 'Evaluation of action' was the only key element of reflection that was not expressed at a higher level in the AWAREs than in the unstructured reflections. By introducing the virtue ethics framework into this section, students may have been more likely to produce evidence-based reasoning, which may have improved ethical reflection. One weakness of virtue ethics as a framework for veterinary students is that there is no accepted list of virtues which are sought in the course of professionalism, and this makes it difficult to teach as an introductory framework (this was evidenced by the lack of engagement with it in the ROPE). In addition, virtue ethics could be considered value based and the AWARE was designed to be a non-value based learning tool that raises awareness of ethical perspectives in a pluralistic way.

Evaluation of students' abilities to apply each of the three frameworks to their chosen incident (see section 4.3.2.1) found that students were able to apply animal rights theory more easily than contractarian and utilitarian. Animal rights theory is rules-based and therefore simpler to apply. Difficulties arose with weighing up interests and using reasoning to decide on an appropriate course of action. Balancing interests requires understanding and quantifying costs and benefits. These skills could be considered the aspects of ethical development that are most important in producing competent

practitioners and this appears to be the area in which veterinary students need assistance. The AWARE was not intentionally designed to favour a utilitarian standpoint, however, many components of the exercise resembled utilitarian reasoning. Animal welfare stems from utilitarianism and students had to consider animal welfare incidents in terms of maximising benefits and minimising harms as well as the consequences of the incident. It is reasonable to consider that a tool that aims to facilitate ethical reasoning, especially in relation to farming, will be most practical when based on the utilitarian viewpoint. Utilitarianism is the mainstream view in veterinary practice (Fogle & Abrahamsom, 1990) and is a framework that considers both the welfare of people and animals. Furthermore, supporters of the utilitarian view are often those that seek to improve the lives of animals through realistic means, which has clear relevance to veterinary practice.

7.1.3   Assessment

All clinical students scored at least a satisfactory rating on the AWARE unlike a small percentage of pre-clinical students. Whilst clinical students are at a more advanced stage in their training, it is likely that this difference arose due to student engagement: the clinical exercise was assessed as part of a compulsory module whereas the pre-clinical was voluntary and did not contribute to any grade. The motivation for a task that has no bearing on final grades is likely to be reduced in students that are heavily focused on assessed work and passing exams (Blumberg, 2005). Donaghy & Morss (2007) discovered through focus groups that if physiotherapy students' reflective assignments had not been assessed they were not likely to have fully engaged with them. Although most authors include reasons not to assess reflection (Boud, 2001; Harris, 2008; Wallman, 2008), they almost all concede that assessment of some form is necessary for students to engage (Driessen et al., 2005; Harris, 2008; Kember et al., 2008) and that assessment in most cases is desired (Boud, 2001; Hannigan, 2001). Determining ethical competency is difficult (Wiseman-Orr et al., 2009) but as the AWARE is easily evaluated in terms of reflection and engagement, it could provide an accessible method for assessing ethical awareness. It would be expected that by graduation students had attained a satisfactory engagement score and this score could be used to represent a competency in ethical awareness as part of a 'Day 1 skill' relating to ethical skills.

7.1.4   Moral reasoning versus ethically relevant content

In Chapter 4, the ethically relevant nodes considered analagous to ethical reasoning ('arguments for', 'arguments against' and 'balancing') demonstrated that students were capable of sound moral reasoning but at a non-defined level. The likelihood is that these arguments were simplistic, as supported by the ethical sensitivity results where only 9% of responses scored the highest achievable score of 3 (defined as an ethically sound statement that considered the issue from more than one perspective). The AWAREs were assessed in terms of levels of reflection and ethical content as this was considered to most closely resemble the learning objectives outlined (see Chapter 3). Creating a measure with which to validate the AWARE content in terms of Kohlbergian moral reasoning (Kohlberg, 1958) would have required additional testing which was beyond the scope of this project. However, a measure created for assessing reflective assignments by student nurses in terms of moral reasoning, the Ethical Reasoning Test (ERT) (McAlpine et al., 1997), provides the basis for a rudimentary comparison between the reflective content of the AWAREs and Kohlbergian moral reasoning levels (Table 7.1). The ERT has three levels of ethical reasoning – traditional, traditional/reflective and reflective, with several of the criteria for each level derived from Kohlbergian levels of moral reasoning. The majority of the AWAREs equated to traditional/reflective on the ERT scale, the level corresponding to conventional moral reasoning. Very few of the AWAREs reflected the ERT's traditional level, the level matched with pre-conventional moral reasoning, whereas this level was predominant in most of the unstructured reflections. And, although many of the AWAREs had content pertaining to the reflective level, a level with criteria similar to that of post-conventional moral reasoning, this made up a relatively small proportion. Thus, this simple comparison suggests that the AWARE may facilitate moral reasoning at a conventional level but for reasoning at the more advanced level of post-conventional, a more complex tool or further in-depth discussion of issues may be required. It also may be that students can spontaneously produce conventional level arguments but not post-conventional ones, though they often identify with those at a higher level when presented with them in a recognition type test as was evidenced by the DIT, where the largest proportion of students were reliant on post-conventional level moral reasoning.

Level on ERT	Representative elements for level on ERT	Corresponding moral reasoning level	Evidence of this level within the pre-clinical AWAREs
Traditional	Reflects personal beliefs Focus on obedience to others Practical considerations dominate Non or low recognition of ethical issues Sees issues as black or white Primary concern for self	Pre-conventional (reasoning based on self-interest)	Many of these elements portayed through descriptive reflection (relates to personal feelings about the situation, reflects on incident on a personal level, no deeper considerations). Very few of the AWAREs evidenced only this level.
Traditional/ reflective	Practical considerations remain important Some recognition of ethical issues Consider more than own personal beliefs Cognitive dissonance is evident as conflicting duties to patients/ employers/ superiors are realised Not able to propose solutions to resolve conflicts May question norms but generally remain within traditional boundaries	Conventional Movement away from self-interest and reasoning is based on conforming to social norms.	Students indicated that standard practice was considered the norm and as such that made them justifiable with little questioning of the basis, similar to reasoning based on social norms (conventional). AWARE prompts consideration of conflicting duties and the resulting cognitive dissonance is the basis for the reflection. The resulting internal discourse is akin to dialogic reflection which forms the majority of the content of the AWAREs. Most AWAREs were predominantly this level.
Reflective	Use of ethical frameworks to clarify, evaluate and justify various viewpoints Actions patient/client centred Willingness to challenge unethical practises Critical thinking about ethical issues	Post-conventional (Critical thinking about ethical issues, use of ethical frameworks, willingness to challenge unethical practices.)	Students seldom act so no evidence of animal centred actions. Students struggled to apply ethical frameworks to justify their own viewpoint but were better able to apply them in relation to a third party, though there was still evidence of difficulties and misunderstandings. Most students challenged unethical practices though arguments often brief and superficial Evidence in the majority of the AWAREs of critical thinking about ethical issues but usually short. Most AWAREs have some evidence of this level but comprises a small proportion

Table 7.1: Comparison between reflective content of the AWAREs and Kohlbergian moral reasoning levels

In Chapter 2, the idea of the AWARE as a tool to improve lower scoring students was mooted and in Chapter 4, the results of the DIT found that there were no differences in Types overall before and after completion of the AWARE (Types indicate the reasoning predominant in the respondent's answers). However, when examining lower scoring students (n= 16), 81% had a higher Type after completing the AWARE than beforehand (Figure 7.1). This indicates that completion of the AWARE improves moral reasoning of lower scoring individuals and lends support to the argument that the AWARE may improve moral reasoning below the post-conventional level. As many veterinary students in this study, recorded basic ethical reasoning skills, the AWARE could be used as an educational intervention to help achieve competence in conventional level moral reasoning and an acceptable standard of ethical awareness. A challenge remains to develop teaching tools that enable students to spontaneously produce arguments at the post-conventional level in order that they can deal with the complex situations arising in professional practice.
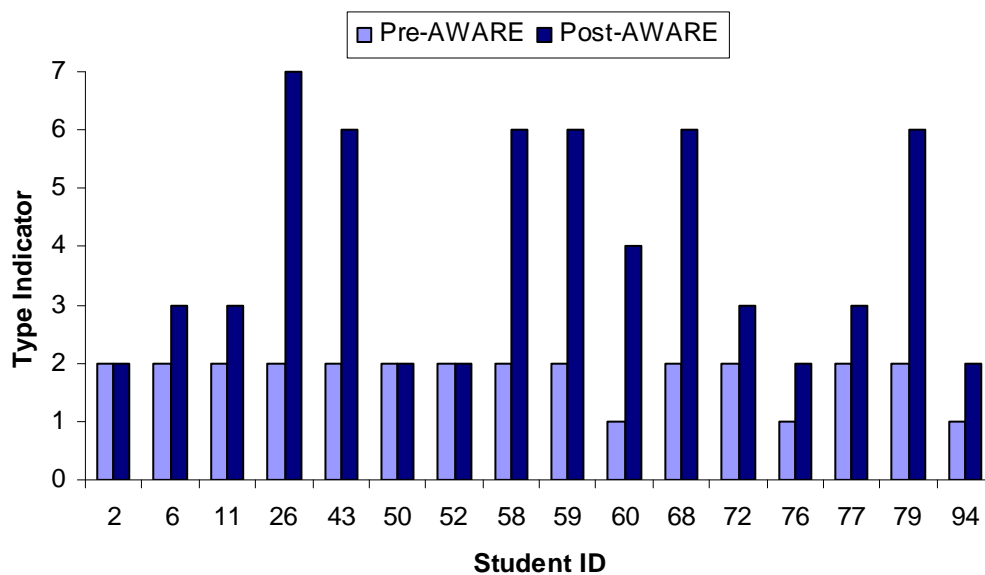
Figure 7.1: Type indicators before and after completing the AWARE for low scoring students

Low scoring students were students who were Type 1 or 2 on the pre-AWARE DIT (reliant on pre-conventional moral reasoning)

7.1.5   Lack of improvement on ethical development measures

No improvement in ethical sensitivity as measured by the TESS or in moral reasoning as tested by the DIT was seen after students had completed the AWARE. The TESS failed to detect an improvement in ethical sensitivity although feedback showed that students perceived an improvement in their ability to identify ethical issues. The suboptimal TESS scores recorded by veterinary students in this study are indicative of poor ethical sensitivity, but this is not necessarily the case. They were not asked to specifically identify ethical issues so it may be that they do not view ethical issues as of greater importance than those of a scientific nature and it is perfectly comprehensible that they would include scientific answers. Clarkeburn (2000) insists that to assess ethical sensitivity the goal of the test should not be disclosed to students. In contrast, other studies have revealed the aim (Hebert et al., 1990; Myyry & Helkama, 2002). In the present study, in hindsight, informing students of the purpose of the test could have produced a more reliable measure of their ethical sensitivity. By performing a pre-test, a baseline ability would be recorded with which to compare post-test results and evaluate the impact of the intervention. As it is the change in score that is of interest rather than the actual scores this negates the need to conceal the purpose of the test. Wiseman-Orr and colleagues (2009) suggested a similar approach to testing ethical development in veterinary students by asking them to select the scenarios that include ethical issues within a range of scenarios. The difference with this approach is that students would be tested on recognition rather than spontaneous production of ethical issues; a methodological difference that is highlighted in moral reasoning measures but that has not been considered in relation to ethical sensitivity measures.

Having examined the reflective elements seen in the AWAREs in conjunction with a moral reasoning scale (Table 7.1), it is possible that the AWARE is developing ethical reasoning at a level below post-conventional. The DIT was designed to focus on post-conventional level moral reasoning and not to measure small changes in moral reasoning at all developmental levels (Walker, 2002). It may be more realistic that an exercise designed for first year students focuses on developing ethical awareness at the conventional level, especially when there are some students who are relying on the basic level of pre-conventional moral reasoning. A previous study on moral reasoning in veterinary students found an increase in moral reasoning following an ethics course based on didactic teaching and when moral reasoning was measured by the SRM (Self et al., 1993b). The SRM measures moral reasoning up to the conventional level so this may explain why a

difference was seen. Post-conventional moral reasoning is based on shared ideals (Walker, 2002). The moral status of animals is not universally agreed upon, which may make it more difficult to apply reasoning at the post-conventional level to dilemmas involving animals and therefore, may explain why the AWARE had no impact on that level of moral reasoning.

Feedback was not given to students on their performance on the AWARE during validation and this is a factor that could have influenced scores on the moral development measures. Successful programmes where feedback has improved moral reasoning scores have tailored the feedback to the level achieved by the student. Reiman & Thies-Sprinthall (1993) provided "more structured, direct, encouraging and less complicated feedback" to students that showed lower levels of reflection in their assignments and students that appeared to be at a more advanced stage of development were given "less structured and more theoretical feedback". This approach was successful in improving moral reasoning ability. A similar approach has been used as part of the dental ethics curriculum at the University of Minnesota (Bebeau, 1993), where students sit the DIT on entry to the dental course and are given personalised feedback on the results, and additionally, if the student scores below the required level, they are given remedial help to improve their ethical reasoning. This approach is one that could be copied within veterinary curricula in order to identify students who may require additional support in this area. In the future, feedback will be incorporated into the WEAVE programme in order to achieve maximum benefits from the programme.

7.2   Moral reasoning abilities in veterinary medicine

Study population	Mean P score ± standard deviation	Sample size	95% confidence interval
First year veterinary students (Cohort 2)	39.6 ± 12.8	103	37.1 – 42.1
Fourth year veterinary students	37.6 ± 14.9	50	33.4 – 41.8
Fifth year veterinary students	42.0 ± 15.0	15	33.7 – 50.3
Practising veterinarians	38.2 ± 2.2	38	33.6 – 42.7
Academic veterinarians	43.3 ± 2.5	27	38.1 – 48.5

Table 7.2: Comparison of mean P scores on the DIT-2 of veterinary students and qualified veterinarians

When comparing DIT P scores for all the groups examined in this study, there is no difference in moral reasoning abilities between students at different stages of the veterinary course or between the average first year veterinary student and the average qualified veterinarian (Table 7.2). The small sample sizes and the relatively wide variances will have contributed to this but even the lowest scoring academic veterinarians in this study, who will almost all hold doctorates, something that is expected to elevate scores (Rest, 1993), do not outperform the most advanced first year veterinary students. Many qualified veterinarians will not have received ethics tuition during their training as it is a relatively new addition to the curricula and it is not an area in which professional development opportunities are offered. The major issue of concern here is that of value based ethics teaching being carried out by mentors with no greater ability in ethical reasoning than that of their students. It has also been found that medical faculty describe unethical behaviour in terms of character traits rather than providing evidence of specific unethical acts (Lowe et al., 2001) providing further support that clinicians understanding of ethics may be limited to those of one's moral values rather than aspects of cognitive moral development. This opens up the possibilities of ethical influences being less than ideal, as discussed by Hafferty & Franks (1994), in relation to the hidden curriculum in medicine. Furthermore, it suggests that ethics is viewed as being less important than clinical subjects (Nolan &

Smith, 1995) as it would be unheard of for students to be taught clinical subjects by someone less capable than them. The endorsement of ethics by faculty is vital in order to convey it as an important part of professional development (Rhode, 1992), but moreover, veterinary students would benefit greatly from ethics teaching by specialists, ideally in collaboration with clinical members of staff. This recommendation is supported by Tannenbaum (1993) who stated that:

> "Veterinary ethics will not, however, become a serious discipline until philosophers, legal scholars, and social scientists participate with veterinarians in the discussion of moral issues relating to animals."

The perceived lack of importance of ethics teaching by students is also evident by the sample sizes achieved for the DIT in this study. All students that attended an ethics teaching session in fourth year (assigned for the whole year group) completed the DIT; the session had a 57% attendance. Along with the perception of ethics, veterinary students' reluctance to participate in additional tasks that have no bearing on grades resulted in only 16% re-sitting the DIT in final year, even though students were emailed individually with a request and offered an incentive. This is a problem that has constrained other studies looking at moral reasoning; Self and colleagues first study (1991) investigating moral reasoning abilities in veterinary students also included only 16% of the student population and a longitudinal study on medical students through their four years of medical school (USA) struggled to retain participants, with only 26% completing the full study (Self & Olivarez, 1996). To increase participation, testing as part of a formative assessment could be introduced to provide larger, more representative samples.

The finding that graduating veterinary students and qualified veterinarians are not as well developed morally as might ordinarily be expected as a result of completing a degree (Rest, 1993) may be representative of a larger area of influence than solely the impact of veterinary education. Clarkeburn (2000) in her doctoral thesis on developing an ethics curriculum for life science students proposes that universities have become more about training than education, that they do not provide the optimal environment for students to develop morally and that ethics teaching may not be able to counteract this. The students in her study scored relatively low on the DIT (P score mean = 31.7) and she thinks that this may be representative of a trend in young adults in recent years in the UK. This idea is supported by the results of several studies on students on professional degree courses where the mean moral reasoning scores found were less than those of the DIT norms created in the early 1990s (Chaves, 2000; Latif & Dunn, 2004; Gallagher, 2011), and that

the public sample in this study, although more highly educated than average, had a mean score lower than the DIT norm generated for the general adult population (USA). Thus, the failure of education to improve moral reasoning may not be a problem confined to veterinary medicine. Furthermore, May (2011) points out that there seems to have been a shift in professions from a responsibility to society to one of self-interest. If this is the case then this could explain the lack of increase in scores on a test where moral ideals are based on a justice concept of morality (fairness for all). As self-interest is represented by pre-conventional level reasoning, it may also explain the reliance by some qualified veterinarians on this simplistic level of reasoning. If, in the 20 years since the DIT norms were created, there has been a general decline in moral reasoning abilities of university students and professionals then there is even more need to provide training opportunities to develop these skills.

7.3   Study limitations

7.3.1   Limitations of standardised measures

The standardised tests available with which to evaluate the effectiveness of the AWARE and levels of ethical reasoning, were limited to measures from outwith veterinary medicine and therefore the scenarios were not veterinary (a point that has been raised in previous chapters), and as a result, the tests may not give a true indication of how students would reason in veterinary situations. Both the TESS and the DIT had several limitations that are outlined in Chapters 2 and 4, including the TESS's lack of validation and that the scenarios in the DIT are based on social issues rather than veterinary or animal-based scenarios. Additionally, the DIT was designed to concentrate on the adoption of post-conventional level reasoning so is less sensitive to changes in lower levels of moral reasoning than other measures such as the SRM-SF. The decision to continue using the DIT and reject the SRM-SF after piloting both measures (Chapter 2) was in part because of the ease of marking the DIT compared to the SRM-SF. As well as being time-consuming to assess, to ensure the reliability of the SRM-SF results the test protocols should be marked by at least two raters. However, they were only marked by one person as appeals for a second were not successful. Thus, the inter-rater reliability of the results could not be confirmed and these results should be considered with caution.

7.3.2   Student motivation

Relying on students as subjects has its risks, as there is no control over their participation in the tasks. The irrelevance of the DIT social issues to veterinary work likely affected students' motivation to take the test. However, informing students of the purpose of the test could have created a bias known as the Hawthorne effect (Adair, 1984) whereby respondents alter their behaviour because they know they are being tested and may try to answer in what they think is the 'correct' way rather than providing their true thoughts. The issue of students being 'over-questionnaired' was also raised by faculty during this project and if this is the case then that could lead to resistance towards surveys or participating in scientific research. In hindsight, asking for a smaller number of interested volunteers to complete the post-DIT, who were more willing to complete the task, could have given a more accurate representation of the students' abilities. Although the DIT is designed to purge respondents that select the nonsense statements (Rest, 1993) it cannot differentiate between students who purposely pick simplistic reasons because they think it is amusing (something intimated to the researcher by fellow students) and those that picked them because they think they are important reasons.

Moreover, many other results reported in this thesis are based on students' perceptions (welfare issues, veterinarians' professionalism, feedback on ability) and although they lend important information to the results, they were not able to be substantiated by outcome measures. Feedback is commonly used to assess educational interventions (Tysinger et al., 1997; Dyson, 2003; Adams & Ladner, 2004; Brandt & Bateman, 2006) because it is the most accessible way of attaining results on concepts that would be complex to evaluate empirically (e.g. whether ability to respect other people's viewpoints had improved) and its limitations are well recognised.

7.3.3   Sample sizes and statistical limitations

Aside from the limits of the measures used to assess moral reasoning, the small sample of fifth year students that completed the DIT-2, and even fewer who completed it both in fourth and fifth year, limit the inferences that can be drawn from these results. The feedback surveys were also completed by small numbers of students which may not have

been representative of the group as a whole. Although it appears that veterinary education at the University of Glasgow does not improve moral reasoning scores, this result may have been different with a larger, more representative sample. A further limiting factor is that the cross-sectional comparison does not account for cohort differences and therefore to fully investigate the impact of veterinary education on moral reasoning the same students that were tested in first year (cohort 2) should be tested at the end of their fifth year (in 2015).

It must be noted that the results in Chapters 2, 3 and 4 of this thesis are based on students at one Scottish University. In a paper on moral growth during medical training, Andre (1992) states that institutions shape perception, and there may be particular characteristics of students at this University that would not be seen in students elsewhere. The diversity of the cohorts within the veterinary student population at the University of Glasgow was much greater than was anticipated at the outset, as there is a relatively high proportion of North American graduates and others blending with British school leavers. This resulted in students with a wide range of experience, both outwith academia and within, and this likely contributed to variation in engagement and moral reasoning scores. Such diversity in ethical development may not have been seen in a veterinary population with a more traditional intake (such as the cohort from the University of Bristol described in Chapter 5).

A large number of independent variables could have been tested in students with such a variety of experiences and backgrounds; those recorded such as gender, degree, upbringing and nationality were chosen as the most likely factors to impact engagement with an educational tool and the level of ethical development. Due to the gender bias inherent in veterinary courses, a much lower number of males were available for study than females. After data collection, it became apparent that some categories were unbalanced (e.g. students raised on a farm) and impeded meaningful statistical comparisons.

Had an improvement in scores of moral development tests been seen, due to the quasi-experimental design (this is where the experimenter can control who is part of the experiment but cannot control exposure (Goldie et al., 2001)), the conclusions drawn would have been limited. This is because although the goal was to test whether the AWARE had any impact on moral reasoning scores, the experimenter had no control over what other factors students were exposed to over the course of the experiment that could have influenced scores.

7.3.4   Qualitative analysis

The qualitative analysis leant weight to the results by directly analysing the content of the reflections. However, the content validation in this study was based mainly on the interpretation of one researcher. Nodes and their definitions were checked and discussed with two other researchers but the coding itself was carried out by the primary researcher. To strengthen the robustness of the findings, inter-rater reliability could be calculated by asking another researcher to code a sample of the reflections using the nodes and definitions provided. This was not done due to lack of staff time.

Focus groups were organised to give students an opportunity to discuss their experiences on PC-EMS. Discussing their own experiences and listening to others expands students' awareness of others' moral reactions (Ohman & Ostman, 2008). The focus groups were poorly attended and the students were hesitant to speak up resulting in little free-flowing discussion between students. The inexperience of the facilitator in the second round of focus groups (2011) also contributed to the lack of additional information gained from this source. Success of courses based around group discussions are very much dependent on the ability of the facilitator (Clarkeburn, 2000). Providing experienced facilitators and making a post PC-EMS discussion compulsory across the year group may result in greater gains being made in relation to ethical development.

The material collected in Chapter 5 was not available until late in the project and therefore there was no time to qualitatively analyse the written content. The results therefore were based on students' perceptions of veterinarian's actions and a critique of the frameworks used. If more time had been available, qualitative analysis of the ROPEs and further analysis of the AWAREs would have been carried out to ascertain the levels of reflection and the ethical content present within them. Evaluation of the RCVS's guiding principles (RCVS, 2010a) also depended on the student selecting relevant principles to discuss, i.e. in the majority of cases they did not include an analysis of each principle but a selection of them. Therefore, principles that appeared to have been breached most often may have been easier for students to evaluate than others.

7.4   Conclusions and recommendations for improving ethical development in veterinary medicine

The AWARE, the ROPE and WEAVE provide much needed ethics learning tools specifically designed for veterinary medicine. The validation carried out within this study shows that these tools have value in improving ethical awareness but further educational interventions focusing on ethics may be required to see sizeable improvements in veterinary students' ethical development. The introduction of one guided reflective exercise focusing on the ethics of animal welfare issues was not sufficient to impact ethical development at the post-conventional level. It is possible that had more students engaged in the focus groups that improvements in moral reasoning would have been seen. Therefore, more time-consuming approaches such as group discussions with experienced facilitators may be required in order to achieve improvement in this aspect of moral development. Nevertheless, the AWARE improved the ethical content of post EMS reports, raised students' awareness of ethics with regards to animal welfare issues and was viewed positively by students.

As a result of the research carried out in this study, specific suggestions for improvements in ethics education in veterinary medicine are:

- Introduction of reflective tools along with additional interventions to improve ethical abilities
- Introduction of ethics teaching at an early stage of the course and continuation of it throughout the curriculum using a variety of teaching approaches
- Development of ethics Continuing Professional Development (CPD) for practising veterinarians
- Development of veterinary specific measures for characterising moral development

7.4.1   Introducing ethics teaching at an early stage

The majority of UK veterinary students enter the veterinary course directly from high school and unlike students from North America they do not have to do an undergraduate degree prior. Consequently, on average, UK students are younger and enter veterinary education at an earlier stage of moral development. This means that they are likely to have to undergo more extensive development over the same time period to achieve advanced

levels of ethical reasoning. By introducing ethics teaching early in the curriculum this gives students the best possible chance of attaining the desired competencies by the end of their fifth year.

Another advantage of improving students' awareness of ethical issues early in the course is that they may be less influenced by unethical practices during EMS and by enculturation of professional training. Several studies found that a small ethics intervention in first year had benefits that stayed with students for the remainder of their course (Hebert et al., 1992; Self & Olivarez, 1996; Goldie et al., 2002). It also raises the profile of ethics as an important part of their professional development. Focusing on personal experiences, for example animal welfare incidents witnessed on PC-EMS, helps to convey to students the relevance of ethics to their own situation rather than a topic external to them or that they have to deal with only in later years. Discussing each other's experiences in small groups and then asking students to report back on someone else's experience is likely to heighten awareness of ethical perspectives that they have not considered previously.

7.4.2   Development of Continuing Professional Development in veterinary ethics

The levels of engagement in pre-clinical and clinical students were similar indicating that the AWARE would be suitable for qualified veterinarians with varying levels of reflective ability as well. Competencies relating to reflection now form part of the RCVS's Professional Code of Conduct (RCVS, 2012) and are therefore, a required skill set for all members of the profession. In particular, they are expected to reflect upon performance, any unexpected critical events and upon communications with colleagues and clients (matters on which, reflection is encouraged by the ROPE), with a view to making appropriate changes to practice (Section 6.2, RCVS, 2012). The AWARE provides a simple, structured reflective tool that centres on the ethical basis of cases, which could easily be adopted into Professional Development Plans and Continuing Professional Development (CPD) portfolios of practising veterinarians.

Although reflection is becoming more frequently used in veterinary curricula, little research has gone into investigating the learning benefits of engaging students in such activity. There are a plethora of papers describing the use of reflection in various professions for a variety of reasons but there are fewer papers that have investigated the

impacts of reflection on the competency of practitioners (Crenshaw, 2012; Mamede et al., 2012). More work needs to be done to investigate the effect of reflection on the competence of veterinarians as practitioners. As higher moral reasoning scores should correlate with enhanced competence in decision-making, measuring the impact of reflection on practising veterinarians' moral reasoning levels would be one way to examine this.

Aside from including reflection in professional development, the finding that practising veterinarians score no higher than the public on tests of moral reasoning supports the need for training in ethical decision making given the ethical demands of their role. This is particularly important for those veterinarians who feel that they regularly face stressful ethical dilemmas and those without formal training in ethics (Batchelor & McKeegan, 2012). Veterinarians should also be given the opportunities within practices to explore difficult situations they have faced with colleagues as this may increase their confidence in decision making (Morgan & McDonald, 2007).

7.4.3   Development of veterinary measures of moral development

To accurately measure ethical development of veterinarians and veterinary students in practice-specific dilemmas, it is imperative that veterinary specific tools are developed. Tools to measure all four components of Rest's (1983) morality model have been created for dentistry (Bebeau, 1993). Similar research and development would greatly benefit the veterinary field.

The incidents described in the AWAREs provide data on the types of ethical incidents students face on PC-EMS. This data could be used to form the basis of scenarios for ethical development tests specific to veterinarians. The incidents identified by students could be used in the formation of vignettes for an ethical sensitivity test, and additionally, they could be used as the basis of scenarios in a veterinary specific moral reasoning measure similar to the DIT. In a recognition measure, students' arguments for and against actions could be used to contribute to the generation of statements that respondents are required to choose from. To attain a full range of arguments at different moral reasoning levels, people of different levels of expertise would need to be engaged (Wiseman-Orr et al., 2009). Further scenarios could be sourced from practising veterinarians in different types of

practice. Scenarios would involve animals of different species and utility, and would include many different ethical conflicts faced in veterinary practice. Reasoned statements would take into account impacts on different parties, issues concerning rights and duties towards different parties, legal obligations and professional norms as well as including arguments from the perspective of the patient, the client and the veterinarian. Arguments and scenarios would be validated by a number of experts and once the tool had been validated a score that indicates a 'Day 1 competency' could be decided upon. The tool could then be used to assess the effectiveness of veterinary teaching as well as an indicator of abilities within the profession.

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Appendices

Appendix A1: 3-story Defining Issues Test - 1

The stories presented to students completing the short-form of the DIT are given below (for the full DIT instruction and answer sheets see Appendix A3).

Here is the first story for your consideration. Read the story and then turn to the separate answer sheet to mark your responses. After filling in the four most important items for the story, return to this booklet to read the next story. Please remember to fill in the circle completely, make dark marks, and completely erase all corrections.

HEINZ AND THE DRUG

In Europe a woman was near death from a special kind of cancer. There was one drug that doctors thought might save her. It was a form of radium that a druggist in the same town had recently discovered. The drug was expensive to make, but the druggist was charging ten times what the drug cost to make. He paid $200 for the radium and charged $2,000 for a small dose of the drug. The sick woman's husband, Heinz, went to everyone he knew to borrow the money, but he could only get together about $1,000, which is half of what it cost. He told the druggist that his wife was dying, and asked him to sell it cheaper or let him pay later. But the druggist said, "No, I discovered the drug and I'm going to make money from it." So Heinz got desperate and began to think about breaking into the man's store to steal the drug for his wife. Should Heinz steal the drug?

ESCAPED PRISONER

A man had been sentenced to prison for 10 years. After one year, however, he escaped from prison, moved to a new area of the country, and took on the name of Thompson. For eight years he worked hard, and gradually he saved enough money to buy his own business. He was fair to his customers, gave his employees top wages, and gave most of his own profits to charity. Then one day, Mrs. Jones, an old neighbor, recognized him as the man who had escaped from prison eight years before, and whom the police had been looking for. Should Mrs. Jones report Mr. Thompson to the police and have him sent back to prison?

NEWSPAPER

Fred, a senior in high school, wanted to publish a mimeographed newspaper for students so that he could express many of his opinions. He wanted to speak out against the use of the military in international disputes and to speak out against some of the school's rules, like the rule forbidding boys to wear long hair.

When Fred started his newspaper, he asked his principal for permission. The principal said it would be all right if before every publication Fred would turn in all his articles for the principal's approval. Fred agreed and turned in several articles for approval. The principal approved all of them and Fred published two issues of the paper in the next two weeks.

But the principal had not expected that Fred's newspaper would receive so much attention. Students were so excited by the paper that they began to organize protests against the hair regulation and other school rules. Angry parents objected to Fred's opinions. They phoned the principal telling him that the newspaper was unpatriotic and should not be published. As a result of the rising excitement, the principal ordered Fred to stop publishing. He gave as a reason that Fred's activities were disruptive to the operation of the school. Should the principal stop the newspaper?

Appendix A2: Sociomoral Reflection Measure – Short Form

1. Think about when you've made a promise to a friend of yours. How important is it for people to keep promises, if they can, to friends?

Circle one: very important   important   not important

WHY IS THAT VERY IMPORTANT/IMPORTANT/NOT IMPORTANT (WHICHEVER ONE YOU CIRCLED)?

---

2. What about keeping a promise to anyone? How important is it for people to keep promises, if they can, even to someone they hardly know?

Circle one: very important   important   not important

WHY IS THAT VERY IMPORTANT/IMPORTANT/NOT IMPORTANT (WHICHEVER ONE YOU CIRCLED)?

---

3. How about keeping a promise to a child? How important is it for parents to keep promises, if they can, to their children?

Circle one: very important   important   not important

WHY IS THAT VERY IMPORTANT/IMPORTANT/NOT IMPORTANT (WHICHEVER ONE YOU CIRCLED)?

---

4. How important is it to tell the truth?

Circle one: very important   important   not important

WHY IS THAT VERY IMPORTANT/IMPORTANT/NOT IMPORTANT (WHICHEVER ONE YOU CIRCLED)?

_____

_____

_____

_____

5. How important is it to help one's parents?

Circle one: very important   important   not important

WHY IS THAT VERY IMPORTANT/IMPORTANT/NOT IMPORTANT (WHICHEVER ONE YOU CIRCLED)?

_____

_____

_____

_____

6. How important is it to save a friend's life?

Circle one: very important   important   not important

WHY IS THAT VERY IMPORTANT/IMPORTANT/NOT IMPORTANT (WHICHEVER ONE YOU CIRCLED)?

_____

_____

_____

_____

7. What about saving the life of anyone? How important is it for a person (without losing his or her own life) to save the life of a stranger?

Circle one: very important   important   not important

WHY IS THAT VERY IMPORTANT/IMPORTANT/NOT IMPORTANT (WHICHEVER ONE YOU CIRCLED)?

_____

_____

_____

_____

8. How important is it for a person to live even if that person doesn't want to?

Circle one: very important   important   not important

WHY IS THAT VERY IMPORTANT/IMPORTANT/NOT IMPORTANT (WHICHEVER ONE YOU CIRCLED)?

_____

_____

_____

_____

9. How important is it for people not to take things that belong to other people?

Circle one: very important   important   not important

WHY IS THAT VERY IMPORTANT/IMPORTANT/NOT IMPORTANT (WHICHEVER ONE YOU CIRCLED)?

_____

_____

_____

_____

10. How important is it for people to obey the law?

Circle one: very important   important   not important

WHY   IS   THAT   VERY   IMPORTANT/IMPORTANT/NOT   IMPORTANT
(WHICHEVER ONE YOU CIRCLED)?

_____

_____

_____

_____

11. How important is it for judges to send people who break the law to jail?

Circle one: very important   important   not important

WHY   IS   THAT   VERY   IMPORTANT/IMPORTANT/NOT   IMPORTANT
(WHICHEVER ONE YOU CIRCLED)?

_____

_____

_____

_____

THANK YOU FOR COMPLETING THE QUESTIONNAIRE

Appendix A3: Defining Issues Test - 2

DIT-2

Defining Issues Test

Version 3.1

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Instructions

This questionnaire is concerned with how you define the issues in a social problem. Several stories about social problems will be described. After each story, there will be a list of questions. The questions that follow each story represent different issues that might be raised by the problem. In other words, the questions / issues raise different ways of judging what is important in making a decision about the social problem. You will be asked to rate and rank the questions in terms of how important each one seems to you.

This questionnaire is in two parts: one part contains the **INSTRUCTIONS** (this part) and the stories presenting the social problems; the other part contains the questions (issues) and the **ANSWER SHEET** on which to write your responses.

Here is an example of the task:

Presidential Election

Imagine that you are about to vote for a candidate for the Presidency of the United States. Imagine that before you vote, you are given several questions, and asked which issue is the most important to you in making up your mind about which candidate to vote for. In this example, 5 items are given. On a rating scale of 1 to 5 (1=Great, 2=Much, 3=Some, 4=Little, 5=No) please rate the importance of the item (issue) by filling in with a pencil one of the bubbles on the answer sheet by each item.

1

Assume that you thought that item #1 (below) was of great importance, item #2 had some importance, item #3 had no importance, item #4 had much importance, and item #5 had much importance. Then you would fill in the bubbles on the answer sheet as shown below.

GREAT	MUCH	SOME	LITTLE	NO	Rate the following 12 issues in terms of importance (1-5)
●	②	③	④	⑤	1. Financially are you personally better off now than you were four years ago?
①	②	●	④	⑤	2. Does one candidate have a superior moral character?
①	②	③	④	●	3. Which candidate stands the tallest?
①	●	③	④	⑤	4. Which candidate would make the best world leader?
①	●	③	④	⑤	5. Which candidate has the best ideas for our country's internal problems, like crime and health care?

Further, the questionnaire will ask you to rank the questions in terms of importance. In the space below, the numbers 1 through 12, represent the item number. From top to bottom, you are asked to fill in the bubble that represents the item in first importance (of those given you to choose from), then second most important, third most important, and fourth most important. Please indicate your top four choices. You might fill out this part, as follows:

Rank which issue is the most important (item number).

Most important item   ●②③④⑤⑥⑦⑧⑨⑩⑪⑫   Third most important   ①②③●⑤⑥⑦⑧⑨⑩⑪⑫

Second most important   ①②③④●⑥⑦⑧⑨⑩⑪⑫   Fourth most important   ①●③④⑤⑥⑦⑧⑨⑩⑪⑫

Note that some of the items may seem irrelevant to you (as in item #3) or not make sense to you—in that case, **rate** the item as "No" importance and do not **rank** the item. Note that in the stories that follow, there will be 12 items for each story, not five. Please make sure to consider all 12 items (questions) that are printed after each story.

In addition you will be asked to state your preference for what action to take in the story. After the story, you will be asked to indicate the action you favor on a three-point scale (1 = strongly favor some action, 2 = can't decide, 3 = strongly oppose that action).

In short, read the story from this booklet, and then fill out your answers on the answer sheet. Please use a #2 pencil. If you change your mind about a response, erase the pencil mark cleanly and enter your new response.

[Notice the second part of this questionnaire, the Answer Sheet. The Identification Number at the top of the answer sheet may already be filled in when you receive your materials. If not, you will receive instructions about how to fill in the number. If you have questions about the procedure, please ask now.

Please turn now to the Answer Sheet.]

Famine— (Story #1)

The small village in northern India has experienced shortages of food before, but this year's famine is worse than ever. Some families are even trying to feed themselves by making soup from tree bark. Mustaq Singh's family is near starvation. He has heard that a rich man in his village has supplies of food stored away and is hoarding food while its price goes higher so that he can sell the food later at a huge profit. Mustaq is desperate and thinks about stealing some food from the rich man's warehouse. The small amount of food that he needs for his family probably wouldn't even be missed.

[If at any time you would like to reread a story or the instructions, feel free to do so. Now turn to the Answer Sheet, go to the 12 issues and rate and rank them in terms of how important each issue seems to you.]

Reporter— (Story #2)

Molly Dayton has been a news reporter for the *Gazette* newspaper for over a decade. Almost by accident, she learned that one of the candidates for Lieutenant Governor for her state, Grover Thompson, had been arrested for shop-lifting 20 years earlier. Reporter Dayton found out that early in his life, Candidate Thompson had undergone a confused period and done things he later regretted, actions which would be very out-of-character now. His shop-lifting had been a minor offense and charges had been dropped by the department store. Thompson has not only straightened himself out since then, but built a distinguished record in helping many people and in leading constructive community projects. Now, Reporter Dayton regards Thompson as the best candidate in the field and likely to go on to important leadership positions in the state. Reporter Dayton wonders whether or not she should write the story about Thompson's earlier troubles because in the upcoming close and heated election, she fears that such a news story could wreck Thompson's chance to win.

[Now turn to the Answer Sheet, go to the 12 issues for this story, rate and rank them in terms of how important each issue seems to you.]

3

School Board— (Story #3)

Mr. Grant has been elected to the School Board District 190 and was chosen to be Chairman. The district is bitterly divided over the closing of one of the high schools. One of the high schools has to be closed for financial reasons, but there is no agreement over which school to close. During his election to the school board, Mr. Grant had proposed a series of "Open Meetings" in which members of the community could voice their opinions. He hoped that dialogue would make the community realize the necessity of closing one high school. Also he hoped that through open discussion, the difficulty of the decision would be appreciated, and that the community would ultimately support the school board decision. The first Open Meeting was a disaster. Passionate speeches dominated the microphones and threatened violence. The meeting barely closed without fist-fights. Later in the week, school board members received threatening phone calls. Mr. Grant wonders if he ought to call off the next Open Meeting.

[Now turn to the Answer Sheet, go to the 12 issues for this story, rate and rank them in terms of how important each issue seems to you.]

Cancer— (Story #4)

Mrs. Bennett is 62 years old, and in the last phases of colon cancer. She is in terrible pain and asks the doctor to give her more pain-killer medicine. The doctor has given her the maximum safe dose already and is reluctant to increase the dosage because it would probably hasten her death. In a clear and rational mental state, Mrs. Bennett says that she realizes this; but she wants to end her suffering even if it means ending her life. Should the doctor give her an increased dosage?

[Now turn to the Answer Sheet, go to the 12 issues for this story, rate and rank them in terms of how important each issue seems to you.]

Demonstration — (Story #5)

Political and economic instability in a South American country prompted the President of the United States to send troops to "police" the area. Students at many campuses in the U.S.A. have protested that the United States is using its military might for economic advantage. There is widespread suspicion that big oil multinational companies are pressuring the President to safeguard a cheap oil supply even if it means loss of life. Students at one campus took to the streets, in demonstrations, tying up traffic and stopping regular business in the town. The president of the university demanded that the students stop their illegal demonstrations. Students then took over the college's administration building, completely paralyzing the college. Are the students right to demonstrate in these ways?

[Now turn to the Answer Sheet, go to the 12 issues for this story, rate and rank them in terms of how important each issue seems to you.]

DIT-2 Answer Sheet

University of Minnesota
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Please read story #1 in the INSTRUCTIONS booklet.

Famine -- (Story #1)

What should Mustaq Singh do? Do you favor the action of taking the food? (Mark one.)

① Should take the food ② Can't decide ③ Should not take the food

GREAT MUCH SOME LITTLE NO

Rate the following 12 issues in terms of importance (1-5)

1. Is Mustaq Singh courageous enough to risk getting caught for stealing?
2. Isn't it only natural for a loving father to care so much for his family that he would steal?
3. Shouldn't the community's laws be upheld?
4. Does Mustaq Singh know a good recipe for preparing soup from tree bark?
5. Does the rich man have any legal right to store food when other people are starving?
6. Is the motive of Mustaq Singh to steal for himself or to steal for his family?
7. What values are going to be the basis for social cooperation?
8. Is the epitome of eating reconcilable with the culpability of stealing?
9. Does the rich man deserve to be robbed for being so greedy?
10. Isn't private property an institution to enable the rich to exploit the poor?
11. Would stealing bring about more total good for everybody concerned or wouldn't it?
12. Are laws getting in the way of the most basic claim of any member of a society?

Rank which issue is the most important (item number).

Most important item ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫   Third most important ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫

Second most important ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫   Fourth most important ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫

Now please return to the Instructions booklet for the next story.

Reporter -- (Story #2)

Do you favor the action of reporting the story? (Mark one.)

① Should report the story ② Can't decide ③ Should not report the story

GREAT MUCH SOME LITTLE NO

Rate the following 12 issues in terms of importance (1-5)

1. Doesn't the public have a right to know all the facts about all the candidates for office?
2. Would publishing the story help Reporter Dayton's reputation for investigative reporting?
3. If Dayton doesn't publish the story wouldn't another reporter get the story anyway and get the credit for investigative reporting?
4. Since voting is such a joke anyway, does it make any difference what reporter Dayton does?
5. Hasn't Thompson shown in the past 20 years that he is a better person than his earlier days as a shop-lifter?
6. What would best serve society?
7. If the story is true, how can it be wrong to report it?
8. How could reporter Dayton be so cruel and heartless as to report the damaging story about candidate Thompson?
9. Does the right of "habeas corpus" apply in this case?
10. Would the election process be more fair with or without reporting the story?
11. Should reporter Dayton treat all candidates for office in the same way by reporting everything she learns about them, good and bad?
12. Isn't it a reporter's duty to report all the news regardless of the circumstances?

Rank which issue is the most important (item number).

Most important item ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫   Third most important ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫

Second most important ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫   Fourth most important ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫

Now please return to the Instructions booklet for the next story.

PLEASE DO NOT WRITE IN THIS AREA

1027278

School Board -- (Story #3)

Do you favor calling off the next Open Meeting?

    ① Should call off the next open meeting   ② Can't decide   ③ Should have the next open meeting

GREAT MUCH SOME LITTLE NO

Rate the following 12 issues in terms of importance (1-5)

①②③④⑤   1. Is Mr. Grant required by law to have Open Meetings on major school board decisions?

①②③④⑤   2. Would Mr. Grant be breaking his election campaign promises to the community by discontinuing the Open Meetings?

①②③④⑤   3. Would the community be even angrier with Mr. Grant if he stopped the Open Meetings?

①②③④⑤   4. Would the change in plans prevent scientific assessment?

①②③④⑤   5. If the school board is threatened, does the chairman have the legal authority to protect the Board by making decisions in closed meetings?

①②③④⑤   6. Would the community regard Mr. Grant as a coward if he stopped the open meetings?

①②③④⑤   7. Does Mr. Grant have another procedure in mind for ensuring that divergent views are heard?

①②③④⑤   8. Does Mr. Grant have the authority to expel troublemakers from the meetings or prevent them from making long speeches?

①②③④⑤   9. Are some people deliberately undermining the school board process by playing some sort of power game?

①②③④⑤   10. What effect would stopping the discussion have on the community's ability to handle controversial issues in the future?

①②③④⑤   11. Is the trouble coming from only a few hotheads, and is the community in general really fair-minded and democratic?

①②③④⑤   12. What is the likelihood that a good decision could be made without open discussion from the community?

Rank which issue is the most important (item number).

Most important item   ①②③④⑤⑥⑦⑧⑨⑩⑪⑫   Third most important   ①②③④⑤⑥⑦⑧⑨⑩⑪⑫

Second most important   ①②③④⑤⑥⑦⑧⑨⑩⑪⑫   Fourth most important   ①②③④⑤⑥⑦⑧⑨⑩⑪⑫

Now please return to the Instructions booklet for the next story.

Cancer -- (Story #4)

Do you favor the action of giving more medicine?

    ① Should give Mrs. Bennett an increased dosage to make her die   ② Can't decide   ③ Should not give her an increased dosage

GREAT MUCH SOME LITTLE NO

Rate the following 12 issues in terms of importance (1-5)

①②③④⑤   1. Isn't the doctor obligated by the same laws as everybody else if giving an overdose would be the same as killing her?

①②③④⑤   2. Wouldn't society be better off without so many laws about what doctors can and cannot do?

①②③④⑤   3. If Mrs. Bennett dies, would the doctor be legally responsible for malpractice?

①②③④⑤   4. Does the family of Mrs. Bennett agree that she should get more painkiller medicine?

①②③④⑤   5. Is the painkiller medicine an active heliotropic drug?

①②③④⑤   6. Does the state have the right to force continued existence on those who don't want to live?

①②③④⑤   7. Is helping to end another's life ever a responsible act of cooperation?

①②③④⑤   8. Would the doctor show more sympathy for Mrs. Bennett by giving the medicine or not?

①②③④⑤   9. Wouldn't the doctor feel guilty from giving Mrs. Bennett so much drug that she died?

①②③④⑤   10. Should only God decide when a person's life should end?

①②③④⑤   11. Shouldn't society protect everyone against being killed?

①②③④⑤   12. Where should society draw the line between protecting life and allowing someone to die if the person wants to?

Rank which issue is the most important (item number).

Most important item   ①②③④⑤⑥⑦⑧⑨⑩⑪⑫   Third most important   ①②③④⑤⑥⑦⑧⑨⑩⑪⑫

Second most important   ①②③④⑤⑥⑦⑧⑨⑩⑪⑫   Fourth most important   ①②③④⑤⑥⑦⑧⑨⑩⑪⑫

Now please return to the Instructions booklet for the next story.

PLEASE DO NOT WRITE IN THIS AREA

Demonstration -- (Story #5)

Do you favor the action of demonstrating in this way?

① Should continue demonstrating in these ways   ② Can't decide   ③ Should not continue demonstrating in these ways

GREAT MUCH SOME LITTLE NO

Rate the following 12 issues in terms of importance (1-5)

①②③④⑤ **1.** Do the students have any right to take over property that doesn't belong to them?
①②③④⑤ **2.** Do the students realize that they might be arrested and fined, and even expelled from school?
①②③④⑤ **3.** Are the students serious about their cause or are they doing it just for fun?
①②③④⑤ **4.** If the university president is soft on students this time, will it lead to more disorder?
①②③④⑤ **5.** Will the public blame all students for the actions of a few student demonstrators?
①②③④⑤ **6.** Are the authorities to blame by giving in to the greed of the multinational oil companies?
①②③④⑤ **7.** Why should a few people like Presidents and business leaders have more power than ordinary people?
①②③④⑤ **8.** Does this student demonstration bring about more or less good in the long run to all people?
①②③④⑤ **9.** Can the students justify their civil disobedience?
①②③④⑤ **10.** Shouldn't the authorities be respected by students?
①②③④⑤ **11.** Is taking over a building consistent with principles of justice?
①②③④⑤ **12.** Isn't it everyone's duty to obey the law, whether one likes it or not?

Rank which issue is the most important (item number).

Most important item   ①②③④⑤⑥⑦⑧⑨⑩⑪⑫   **Third most important**   ①②③④⑤⑥⑦⑧⑨⑩⑪⑫
Second most important ①②③④⑤⑥⑦⑧⑨⑩⑪⑫   **Fourth most important**   ①②③④⑤⑥⑦⑧⑨⑩⑪⑫

Please provide the following information about yourself:

1. Age in years:

(digit grid: ⓪⓪ ①① ②② ③③ ④④ ⑤⑤ ⑥⑥ ⑦⑦ ⑧⑧ ⑨⑨)

2. Sex (mark one): ○ Male   ○ Female

3. Level of Education (mark highest level of formal education attained, if you are currently working at that level [e.g., Freshman in college] or if you have completed that level [e.g., if you finished your Freshman year but have gone on no further].)

○ Grade 1 to 6
○ Grade 7, 8, 9
○ Grade 10, 11, 12
○ Vocational/technical school (without a bachelor's degree) (e.g., Auto mechanic, beauty school, real estate, secretary, 2-year nursing program).
○ Junior college (e.g., 2-year college, community college, Associate Arts degree)
○ Freshman in college in bachelor degree program.
○ Sophomore in college in bachelor degree program.
○ Junior in college in bachelor degree program.
○ Senior in college in bachelor degree program.
○ Professional degree (Practitioner degree beyond bachelor's degree) (e.g., M.D., M.B.A., Bachelor of Divinity, D.D.S. in Dentistry, J.D. in law, Masters of Arts in teaching, Masters of Education [in teaching], Doctor of Psychology, Nursing degree along with 4-year Bachelor's degree)
○ Masters degree (in academic graduate school)
○ Doctoral degree (in academic graduate school, e.g., Ph.D. or Ed.D.)
○ Other Formal Education. (Please describe: _____)

4. In terms of your political views, how would you characterize yourself (mark one)?
○ Very Liberal
○ Somewhat Liberal
○ Neither Liberal nor Conservative
○ Somewhat Conservative
○ Very Conservative

5. Are you a citizen of the U.S.A.?
○ Yes   ○ No

6. Is English your primary language?
○ Yes   ○ No

Thank You.

Appendix A4: Example of a scored SRM-SF test protocol

SRM-SF Rating Form

Code #: 0902558	SRMS: 3. 4
Rater: CB	Global Stage: 3(4)
Date: 20/7/10	Moral Type B: Fundamental Valuing O Balancing \ Conscience O Number of Moral Type B Components l

Question	Highest Developmental Level	Aspect Citations	Comments (e.g. Moral Type B components, marginal score, rules applied)
1. Contract: Friends	4	4:1b	Balancing mutual respect or interdependence - accountability
2. Contract: Anyone	3.5	3/4:8a 2:6f	
3. Contract: Children	3.5	3/4:8c	
4. Truth	3.5	3/4:1a	
5. Affiliation: Parents	2	2:1b, U	
6. Affiliation: Friends	2.5	2:1a 3:1c > equally move so 2.5	
7. Life: Stranger	U		
8. Life: Self	3.5	3/4:2	
9. Property	4	4:1a 3:1a	Balancing
10. Law	4	4:1a 3/4:3b	
11. Legal Justice	3.5	3/4:1 3/4:3b	severity of crime

Space for calculations

$$SRM = \frac{34}{10} = 3.4$$

$$GS = 3(4)$$

Appendix B1: Prototype of the AWARE

This exercise is for use following EMS on cattle, sheep and horse units. It aims to provide you with an enhanced learning experience from your EMS placement through encouraging you to reflect on your own experience in a structured way. The exercise should be completed within 2 weeks of finishing your EMS placement. Please complete all sections.

Reminder of Ethical Theories

There are 3 main ethical theories that are relevant to this exercise – Contractarianism, Utilitarianism and Animal Rights.

The **Contractarian** view is that morality is based on mutual agreements between people and that this mutual cooperation is in all our interests. As animals cannot make agreements, they have no moral status. Their view is that animals' moral status only matters when there is an effect on humans. Possible statements of a Contractarian viewpoint would be:

"Zoos allow us to enjoy the experience of seeing wild animals close up."

"Animal testing is necessary to protect human health."

The **Utilitarian** view is that morality is about balancing harms and benefits. They aim to act in order to achieve 'the greatest good for the greatest number'. Activities which have an adverse impact on the well-being of animals may be justified if they lead to a net increase in welfare (for humans or other animals). This viewpoint considers welfare consequences for animals as well as potential benefits for humans. Typical statements of a Utilitarian viewpoint would be:

"As long as zoos provide enriched enclosures for the animals, they have great educational value."

"Animal testing for vital medicine is acceptable as long as animal suffering is kept to a minimum."

The **Animal Rights** view is that animals have moral rights and that there are fixed ethical rules that place limits on the treatment of animals. This means there are certain things we should not do to an animal whatever the circumstances. For example, they do not believe it is right to kill animals for meat. Their view is that we have a duty to protect individual animals. Example statements of the animal rights view would be:

"Zoos are comparable to keeping animals in prison."

"Animal testing should be banned."

Please note completion of this exercise signifies your consent to the data being used in a research project within Glasgow University. All data will be anonymised and only the content of the exercise will be used in analysis.

If you require any assistance with this exercise please contact: Carole Batchelor
Email: c.batchelor.1@research.gla.ac.uk   **Phone:** 0141 330 7045 or 07854 336483

Helpful Resources

Farm Animal Welfare Websites
Farm Animal Welfare Council - gives information on the Five Freedoms http://www.fawc.org.uk/freedoms.htm.
Compassion in World Farming - *gives an overview of main farming practices and associated welfare issues* http://www.ciwf.org.uk/farm_animals/default.aspx
National Equine Welfare Council provides up to date information on equine welfare issues http://www.newc.co.uk/home/

Animal Ethics Websites:
Animal ethics dilemma – interactive website giving you the chance to work through ethical dilemmas using different ethical theories http://ae.imcode.com/
The **BBC** provides a good overview of animal ethics and common viewpoints http://www.bbc.co.uk/ethics/animals/

1. Background information

Gender: Male ☐ Female ☐	Age:	Nationality:
Previous degree held: Yes ☐ No ☐	Upbringing: Rural (farm) ☐ Rural (non-farm) ☐ Urban ☐	

Duration of this EMS placement:

Of 12 weeks pre-clinical EMS required by the University, how many weeks had you already undertaken before this placement: None ☐ 1-2 weeks ☐ 3-4 weeks ☐ 4-5 weeks ☐ > 5 weeks ☐

and with which species: Sheep ☐ Cattle ☐ Horses ☐ Pigs ☐ Poultry ☐ Other ☐

No. of weeks previous work experience with this species (include all experience even if before vet school):

None ☐ 1-2 weeks ☐ 3-4 weeks ☐ 4-5 weeks ☐ > 5 weeks ☐

Details of establishment where undertaking current EMS placement (type of establishment and number of animals):

---

2. Animal Welfare Related Event

From your <u>own experience</u> of this placement, please choose either

1) a particular event involving human action that you feel impacted animal welfare (positively or negatively) and had ethical implications

or

2) a more general animal welfare issue that through human action impacted a group of animals positively or negatively (this could be the entire herd/flock) and had ethical implications.

Note: Human actions towards animals often have ethical implications. When an action has ethical implications it means that different valid courses of action can benefit different parties more or less favourably depending on the action taken.

Please give an account of your chosen event/issue (this should include when it happened, who was involved, a description of the event/issue itself, the consequences of the event/issue):

Give your reasons for choosing this particular event/issue:

3. Personal reflection

What was your initial reaction/feeling having experienced this event/issue:

Why do you think you felt this way?

Why do you think this action was taken?

4. Ethical viewpoints

Ethical decisions involve different parties with different viewpoints. These affected parties can be benefitted or harmed by a particular decision or action.

Name the affected parties associated with your event/issue:

For each of your named affected parties, list their principle interest/s in this situation:

Provide an argument that supports the human actions contributing to your event/issue:

Provide a counter argument that challenges the human actions involved in your event/issue:

Now you have reflected on this event/issue, which ethical theory do you think your view most closely resembles and give reason/s (use notes on front page to help):

---

5. Round up

Was this the first time you had seen such an event/issue?   Yes ☐   No ☐

Did you discuss this event/issue at the time? Yes ☐   No ☐   If yes, with whom?

Did this placement or this exercise in particular, change your perspective in any way of how you or other people view animals?

Could you have been better prepared for this experience? Yes ☐   No ☐

Please provide details:

Please use this page if you require extra space for any of your responses, adding the number of the section to which the response relates.

THANK YOU FOR TAKING THE TIME TO COMPLETE THIS EXERCISE

Appendix B2: Worked examples of the AWARE

Example of an event involving pigs:

Animal welfare related event

Account of event

Sow had a large litter of piglets. She had stood on one of her piglets while moving about in the nesting shelter. The piglet's leg looked like it was broken. The stockman lifted the piglet and smashed its head off the shelter. It was dead within the next minute or so.

Why this event

This was the most shocking thing I saw during my time at the pig farm.

Initial reaction/feeling after this event:

1) Shocked 2) Disgusted 3) Unhappy

Personal reflection

Reasons for initial reaction/feelings after this event:

Didn't like the violence of the death. Felt shocked that such a treatable injury wasn't treated and the piglet was just killed. Also felt disgusted that it was right beside the sow. By restricting her space they caused her to stand on her piglet. If they'd given her a natural place to give birth then she wouldn't have been so cramped and wouldn't have stood on her piglet in the first place.

What do you think it was about this situation that made you feel this way?

I felt the piglet had a right to life. I think animals should be given veterinary treatment when they have injuries and not killed so heedlessly. I was also worried that killing in that way was not humane and that the piglet would have suffered. I do not agree with intensive farming and think pigs should be allowed to roam free.

Personal reflection

Why do you think this action was taken?

Stockmen said piglet wouldn't survive anyway but I think farmers don't care about their animals, they just care about making money. It probably made him feel powerful subjecting this defenceless animal to torture.

Would you have taken the same action?

'No I would have taken a different action'.

Ethical Reflection

Affected parties:
Stockman
Piglet
Sow
Farmer

Principle interests of each party in this situation:
Stockman – keeping his job -> keeping farmer happy
Piglet – not being in pain, surviving
Sow – protecting her offspring, being given proper care
Farmer – running profitable business where profit is maximised

Ethical arguments

Arguments supporting stockman:
More economical to cull
If humane, removes pain
Chance of stunted growth
Too many for sow to feed

Arguments challenging stockman:
Animal has right to veterinary care
Treatable injury
Better supervision could have prevented it in first place
Would not do that to a puppy (view of species)

Ethical frameworks

Views of supporters of different ethical frameworks

Contractarian (human centric)
– primary concern is for human needs
– pigs there to provide us with meat
– method of killing not important
– would agree with action taken

Utilitarian (balance harms and benefits)
– benefit to piglet would be to remove pain
– cost of vet treatment to farmer more than piglet worth financially
– humane killing likely the best option

Deontology (believes in individual rights)
– individual rights of piglet violated as treatable injury
– should seek veterinary treatment

Ethical framework my view most resembles:
Deontology
Individual animals should be respected and not harmed/killed

Example of an issue involving poultry:

Animal welfare related issue

Account of issue (group of animals)

Spent few days on broiler unit looking after chickens. Chickens were housed in sheds of around 27,500 birds a shed. My job was to walk up and down the sheds and help identify any birds that were lame. If a bird was severely lame it was culled there and then. Culling several birds was a daily occurrence.

Why this issue

Lameness was the largest welfare issue I witnessed during my time at the broiler farm. I also chose an issue affecting the whole group because in broiler rearing it became apparent that individual birds are not regarded as important, it is the health and welfare of the overall flock where the largest welfare issues lie.

Personal reflection

The good thing about reflecting on an experience is that it allows you to take some time to think about it after it has happened and then you are better able to reason why you had that reaction and this helps you to resolve any issues you had with it at the time. So in this reflection, the person's initial reaction was one of distress and criticism of their own ability, but by reflecting on their reaction it helps them to see the reasons they felt this way e.g. they had never seen farming like this before.

Initial reaction/feeling about this issue and reasons:

1) distressing 2) upset 3) unknowledgeable

Initially I found the task of having to select birds for culling quite distressing and was quite upset about the whole thing. I worried that with my limited knowledge of broilers that I might be selecting incorrectly. It also seemed that culling was done regardless of whether the bird could have been treated or not.

What do you think it was about this situation that made you feel this way?

I had never visited a broiler shed before so the intensiveness of the farming really shocked me. The disregard for the individual animal at first really upset me and again, this was because I had not ever been exposed to high intensity farming.

Personal reflection

And by the time they are answering these questions, this person has had a chat with the farmer and has had a think about poultry farming in general and although they found it was quite a distressing process they now appreciate why it happens. You don't necessarily need to agree with the actions, but it is important to be able to understand why it happens.

Why do you think this action was taken?

A single chicken is worth so little that it is not economically viable to give them individual vet treatment, nor is it practical. The focus has to be on the flock as a whole in order to meet consumer needs. Speaking to the farmer, many of the birds with lameness will not meet the growth rate needed and will fall behind the rest of the flock and will not be able to reach the feeders and so will suffer so it makes business sense to cull them early.

Would you have taken the same action?

Yes I would have done the same thing

Ethical Reflection

Affected parties:
Broilers
Farmer
Consumers
If you were culling birds due to lameness then you become an affected party (as you were involved in the action)

Principle interests of each party:
Broilers –to have good quality life free from pain
Farmer –to run economical business, to meet consumer demand
Consumers – to get affordable meat
You – could be to do what is expected of you, not to upset farmer, to feel comfortable with your actions

Ethical arguments

Arguments supporting farmer:
If in pain kinder to kill them
Not financially viable to treat individuals
Frees up more space for surviving chickens (welfare benefit)

Arguments challenging farmer:
Veterinary treatment should be sought
Improved management could reduce lameness
Selecting less fast growing birds could prevent lameness

Ethical frameworks

Views of supporters of different ethical frameworks

Contractarian (human centric)
– primary concern is for human needs
– don't think chickens have moral status
– want affordable meat to be readily available

Utilitarian (balance harms and benefits)
– benefit/cost depends on pain/distress caused by lameness
– focus on reducing suffering by improving management but financial cost to farmer
– growth rate is cost to birds but benefit to farmer

Deontology (believes in individual rights)
– individual rights of broiler not taken into account
– lameness caused by selective breeding imposed by humans
– should not keep poultry in these conditions

You could have just as easily had someone doing this placement that thought our need for cheap meat was not justifiable in order to keep birds in these conditions.

The same situation can be seen from different viewpoints by different people.

Ethical framework my view most resembles:
Utilitarian. Although initially I was upset by the culling process, after understanding more about the narrow margins the farmer works to I was able to understand the reasons the farm was run in this way. I was able to see the need for balancing costs and benefits, consumers want affordable meat so the welfare of the chickens is compromised to do this. Culling puts the animals out of pain and prevents the cost of vet treatment.

Appendix B3: AWARE online feedback survey (2010)

1. Gender:

Male   Female

2. Age:

3. Nationality:

4. Species worked with on EMS placement:

Sheep   Dairy Cattle   Beef Cattle   Horses

5. Before starting vet school, how much time had you spent doing work experience on farms and stables?

None   1-2 weeks   3-6 weeks   7-12 weeks   > 12 weeks

6. Taking into account your previous farm experience, how much do you feel you will learn from pre-clinical EMS?

Nothing   A little   A moderate amount   Quite a lot   A great deal

7. How important are these five learning objectives of pre-clinical EMS to you?

	Not at all important	Unimportant	Neither important or unimportant	Important	Very important
To gain practical experience in animal handling and husbandry	☐	☐	☐	☐	☐
To gain insights into the workings of farms and other animal industries	☐	☐	☐	☐	☐
To link theory with practice	☐	☐	☐	☐	☐
To develop interpersonal skills	☐	☐	☐	☐	☐
To encourage you to reflect on your experiences and record them concisely	☐	☐	☐	☐	☐

8. Which of the following reasons best describes your reason/s for volunteering in the trial of AWARE?

Would be a good learning opportunity ☐

Keen interest in animal welfare ☐

Would improve my EMS experience ☐

Like to help others ☐

Competitive edge on other students ☐

Incentives (free food/print credits) ☐

Would help me with future assignments ☐

Thought it would make reflective commentary easier ☐

Wanted to have influence on its design ☐

Other (please specify) ☐

9. I thought the AWARE exercise was

	Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly disagree
easy to understand	☐	☐	☐	☐	☐
well laid out	☐	☐	☐	☐	☐
relevant to my studies	☐	☐	☐	☐	☐

10. The notes on the front page were

	Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly disagree
helpful	☐	☐	☐	☐	☐
too detailed	☐	☐	☐	☐	☐
not detailed enough	☐	☐	☐	☐	☐

11. I would prefer to complete AWARE electronically than on paper

Agree   Disagree

12. The pre-EMS introductory session

	Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly disagree
explained the exercise clearly	☐	☐	☐	☐	☐
taught me new knowledge	☐	☐	☐	☐	☐
provided all the information needed to complete AWARE	☐	☐	☐	☐	☐
was not necessary as could have completed AWARE without it	☐	☐	☐	☐	☐
gave worked examples which were especially useful	☐	☐	☐	☐	☐

13. The introduction to ethical theory (in the introductory session) was

	Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly disagree
too basic	☐	☐	☐	☐	☐
too complex	☐	☐	☐	☐	☐
boring	☐	☐	☐	☐	☐
useful for helping to write my reflection	☐	☐	☐	☐	☐
relevant to veterinary medicine	☐	☐	☐	☐	☐
relevant for farm placements	☐	☐	☐	☐	☐

14. On the completion of the exercise itself,

	Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly disagree
I liked that there was a free choice of the event/issue to write about	☐	☐	☐	☐	☐
I thought completing AWARE was beneficial to me	☐	☐	☐	☐	☐
I found AWARE difficult to complete	☐	☐	☐	☐	☐
I found it difficult to identify an issue/event to reflect on	☐	☐	☐	☐	☐
I was apprehensive of writing negative comments about other people's actions	☐	☐	☐	☐	☐
I felt uncomfortable including my personal feelings	☐	☐	☐	☐	☐

15. Reflecting on my particular event/issue got me to think more about

	Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly disagree
animal welfare issues on farms	☐	☐	☐	☐	☐
the pressures on farmers	☐	☐	☐	☐	☐
my feelings about the event/issue	☐	☐	☐	☐	☐

16. How much of a change do you feel this exercise made to your ability

	None at all	A little	A moderate amount	Quite a lot	A great deal
to recognise animal welfare issues	☐	☐	☐	☐	☐
to recognise ethical issues	☐	☐	☐	☐	☐
to reflect on your experiences	☐	☐	☐	☐	☐
to respect others viewpoints	☐	☐	☐	☐	☐
to meet your learning objectives for pre-clinical EMS	☐	☐	☐	☐	☐

17. I consulted the resource section to help me

Yes   No

18. I did further research to help my understanding of the issue I wrote about

Yes   No

19. Any other comments you would like to add about AWARE not covered by the questions above

Appendix B4: Categorisation of sheep welfare issues

Category	Sub-category
Financial	General
Stockmanship	General
	Five freedoms
	Inspection
	Handling, discipline & restraint
	Transport
Accommodation	General
	Buildings
	Unsanitary conditions
	Poor bedding
	Pasture Management
	Ventilation
	Space allowances
Feed & Water	Feed & water
	Unsuitable diet
	Overfed
	Lack of food
	Poor quality
Husbandry Practices	Artificial rearing
	Marking
	Castration
	Disbudding and dehorning
	Tail docking
	Shearing/dipping
Health	General
	Prompt recognition of ill health
	Routine health care (Dosing & vac'tion equip)
	Condition scoring
	Lack of foot care
	Parasites
	Euthanasia dilemmas or inappropriate methods
	Lameness
	Sick & injured animals
	Particular conditions
	Lack of treatment
	Dental issues
Management	General
	Environment
	Confinement
Breeding	Breeding & breeding techniques
	Management
	Pregnancy & birthing

Appendix B5: Categorisation of cattle welfare issues

Category	Sub-category
Financial	General
Stockmanship	General
	Five freedoms
	Inspection
	Handling, discipline & restraint
	Transport
Accommodation	General
	Buildings
	Unsanitary conditions
	Poor bedding
	Pasture Management
	Ventilation
	Space allowances
Social grouping	General
Feed & Water	Feed & water
	Unsuitable diet
	Overfed
	Lack of food
	Poor quality
Husbandry Practices	Artificial rearing
	Marking
	Castration
	Disbudding and dehorning
	Enrichment
Health	General
	Prompt recognition of ill health
	Routine health care (Dosing & vaccination equipment)
	Condition scoring
	Lack of foot care
	Parasites
	Euthanasia dilemmas or inappropriate methods
	Lameness
	Sick & injured animals
	Particular conditions
	Lack of treatment
	Downer animals
Management	General
	Environment
	Confinement
	Stereotypies
Breeding	Breeding & breeding techniques
	Management
	Pregnancy & birthing
Use of animals	Over milking

Appendix B6: Categorisation of equine welfare issues

Category	Sub-category
Financial	General
Stockmanship	General
	Five freedoms
	Inspection
	Handling, discipline & restraint
	Transport
Accommodation	General
	Buildings
	Unsanitary conditions
	Poor bedding
	Pasture Management
	Ventilation
	Space allowances
Social grouping	General
Feed & Water	Feed & water
	Unsuitable diet
	Overfed
	Lack of food
	Poor quality
Husbandry Practices	Marking
	Enrichment
	Saddlery (ill fitting)
	Rugs
	Grooming
Health	General
	Prompt recognition of ill health
	Routine health care (Dosing & vaccination equipment)
	Condition scoring
	Lack of foot care
	Parasites
	Euthanasia dilemmas or inappropriate methods
	Lameness
	Sick & injured animals
	Particular conditions
	Lack of treatment
	Dental issues
Management	General
	Environment
	Confinement
	Stereotypies
Breeding	Breeding & breeding techniques
	Management
	Pregnancy & birthing
Use of animals	Riding injured horse
	Rushed recovery
	Bad Riding
	Overworked/ Under exercised
	Use of horses for sport

Appendix B7: Example of an AWARE where the student engaged well

1. Background information		
Gender: Female	Age: 20	Nationality: Singaporean
Previous degree held: No	Upbringing: Urban	
Duration of this EMS placement: 2 weeks		
Of 12 weeks pre-clinical EMS required by the University, how many weeks had you already undertaken before this placement: 1-2 weeks and with which species: Horses		
No. of weeks previous work experience with this species (include all experience even if before vet school): None		
Details of establishment where undertaking current EMS placement (type of establishment and number of animals): Commercial, teaching and research farm (Cochno Farm), 550 ewes and their lambs.		

2. Animal Welfare Related Event
From your <u>own experience</u> of this placement, please choose either 1) a particular event involving human action that you feel impacted animal welfare (positively or negatively) and had ethical implications or 2) a more general animal welfare issue that through human action impacted a group of animals positively or negatively (this could be the entire herd/flock) and had ethical implications. Note: Human actions towards animals often have ethical implications. When an action has ethical implications it means that different valid courses of action can benefit different parties more or less favourably depending on the action taken.
Please give an account of your chosen event/issue (this should include when it happened, who was involved, a description of the event/issue itself, the consequences of the event/issue): Tail-docking (both sexes) and castration (ram lambs) of the little lambs. (a more general animal welfare issue) When: it was part of our daily lambing routine. Who was involved: The Head Stockman taught me and my friend (who was doing EMS at the farm too) on our first day. After that, my friend and I were responsible for this task but there was always someone we could ask if we had any reservations/difficulty. Description of issue: we used rubber rings and an applicator. The rubber rings are placed around the tail/scrotum of the lamb and they work by cutting of the blood supply to the area below the ring. Really learnt a lot about the whole procedure through my time at the farm: 1) the Head Stockman told us from the start that applying the ring at the correct position is very important – leave enough tail to cover the anus for ram lambs and anus and vulva for female lambs. - make sure you go right to the top of the scrotum when castrating as it is more painful if you catch the lambs testicles halfway. Make sure both testicles are descended and make sure that the lamb's teats are not caught in the ring. 2) we only tailed and castrated after the lambs were 24 hours old. But if one didn't look very strong, we would leave him. Also we would leave the lambs (& their mother) in their individual pen for 1 more day after the lambs had been tailed and castrated.

Consequences: I think tailing and castration is painful for the lambs. Sometimes they would just lie down after it had been done (especially the ram lambs). We had trouble getting the rings of the applicators sometimes and I felt so bad because the lambs bleated so much.

Give your reasons for choosing this particular event/issue:

It is an issue on all sheep farms. It helped me to understand about how there are a lot of factors involved in this sheep management practice and is not a simple "right/wrong" issue.

3. Personal reflection

What was your initial reaction/feeling having experienced this event/issue:

I felt a little shaky when I had to do it.
But gradually I got more confident and certain. Being quick helps make it a less terrible experience for the lamb.

Why do you think you felt this way?

I was afraid of hurting the lamb by doing it incorrectly. (I was glad the Head Stockman was there to guide me though. He was very patient, encouraging and when I got the length wrong, he checked and re-did it.)

Why do you think this action was taken?

I found out that tailing makes shearing easier but more importantly, helps prevent fecal and urinary contamination of the hindquarters which could lead to blowfly strike. Castration is done for ease of management so the ram lambs will not mate with their mothers and the ewe lambs when they go out to the pasture.

4. Ethical viewpoints

Ethical decisions involve different parties with different viewpoints. These affected parties can be benefitted or harmed by a particular decision or action.

Name the affected parties associated with your event/issue:

The lambs, my friend and I, the stockpersons.

For each of your named affected parties, list their principle interest/s in this situation:

The lambs: freedom from pain, injury and disease
My friend and I: to follow instructions and to do the task well so the lamb would suffer as little as possible.
The stockpersons: Ease of management. Health of the sheep.

Provide an argument that supports the human actions contributing to your event/issue:

Tailing and castration aid management greatly. Tailing, in particular, has benefits for the lam's future welfare state as it reduces fecal matter caking up which could cause discomfort or worse blowfly strike. A lot of measures are taken to try to reduce the suffering the lamb has to go through. The legal requirement is that tailing and castration by the rubber ring method should only be done within the lambs' first week of life. I wonder how they came up with this time period though?

Provide a counter argument that challenges the human actions involved in your event/issue:

The sheep's tail has a purpose – it protects the sheep's anus, vulva and udder; sheep lift their tails when they defecate and use them to partly scatter their faeces; lambs wag their tails when suckling and this is an important signal to the ewe – and therefore should not be cut or amputated.

Tailing and castration are forms of mutilation. They also cause the lambs fear and pain. The ram lambs could be kept separate from their mothers and female pasture-mates instead of castration.

Now you have reflected on this event/issue, which ethical theory do you think your view most closely resembles and give reason/s (use notes on front page to help):

My view most closely resembles the utilitarian view.

Tailing	Castration
Beneficial to the stockmen (who work really hard) in terms of management of the animals	Beneficial to the female sheep
	May reduce fighting between the others.
Reduces fecal cake-up and blowfly strike	

Because there are valid reasons for tailing and castration that do bring about a net increase in welfare overall, they are acceptable provided they are done properly in a way that seeks to minimise the lamb's suffering.

5. Round up

Was this the first time you had seen such an event/issue?   Yes

Did you discuss this event/issue at the time? Yes   If yes, with whom? My friend (whom I was working with). One of the stockpersons.

Did this placement or this exercise in particular, change your perspective in any way of how you or other people view animals?

Yes. Sometimes it is necessary to take a step back to consider the big picture (especially with farm/production animals like sheep which are kept in large numbers). It is not always possible to feel for each individual animal.

Could you have been better prepared for this experience? No
Please provide details:
I did know that tailing and castration is carried out but experiencing it for myself really made me reflect on the issue and do research through the Internet to find out more. The experience has made this matter truly to me.

Appendix B8: Example of an AWARE where the student did not engage well

1. Background information		
Gender: Female	Age: 19	Nationality: Scottish
Previous degree held: No	Upbringing: Rural (farm)	
Duration of this EMS placement: 3		
Of 12 weeks pre-clinical EMS required by the University, how many weeks had you already undertaken before this placement: 1-2 weeks and with which species: Cattle		
No. of weeks previous work experience with this species (include all experience even if before vet school): None		
Details of establishment where undertaking current EMS placement (type of establishment and number of animals): Sheep farm - lambing		

2. Animal Welfare Related Event
From your <u>own experience</u> of this placement, please choose either   1) a particular event involving human action that you feel impacted animal welfare (positively or negatively) and had ethical implications   or   2) a more general animal welfare issue that through human action impacted a group of animals positively or negatively (this could be the entire herd/flock) and had ethical implications.   Note: Human actions towards animals often have ethical implications. When an action has ethical implications it means that different valid courses of action can benefit different parties more or less favourably depending on the action taken.
Please give an account of your chosen event/issue (this should include when it happened, who was involved, a description of the event/issue itself, the consequences of the event/issue):   While lambing we had a lamb born which was badly deformed – there was no way in which it could live a normal life, also no way of seeing if it was suffering so the farmer put it down.
Give your reasons for choosing this particular event/issue: Its shows that the farmer felt compassion etc… And would do his best to prevent the lamb from suffering.

3. Personal reflection
What was your initial reaction/feeling having experienced this event/issue: I think the farmer acted in the best way possible under the circumstances.
Why do you think you felt this way?   Because I would have done the same thing.

Why do you think this action was taken?

Because it was the kindest thing to do at that time.

---

4. Ethical viewpoints

Ethical decisions involve different parties with different viewpoints. These affected parties can be benefitted or harmed by a particular decision or action.

Name the affected parties associated with your event/issue:

The farmer, another student and me

For each of your named affected parties, list their principle interest/s in this situation:

The farmer – his lamb and he was the one to put it down.
The student – helped lamb it and was involved it looking after the lambs
Me as I helped lambed it and was the one to ask the farmer to put the lamb down.

Provide an argument that supports the human actions contributing to your event/issue:

It is never an easy decision to make but when working with animals it often has to be made. The lamb would not have survived on its own and it was probably in pain.

Provide a counter argument that challenges the human actions involved in your event/issue:

The lamb was alive and 'healthy' it could walk normally we even managed to tube it.

Now you have reflected on this event/issue, which ethical theory do you think your view most closely resembles and give reason/s (use notes on front page to help):

Utilitarianism because the animal was put down it wouldn't be animal rights but it was. Put down to prevent any suffering etc.

---

5. Round up

Was this the first time you had seen such an event/issue?   Yes

Did you discuss this event/issue at the time? Yes   If yes, with whom? Farmer and other student

Did this placement or this exercise in particular, change your perspective in any way of how you or other people view animals?

No

Could you have been better prepared for this experience?   No
Please provide details:

I have worked with animals enough to know this kind of thing happens and some times the kindest thing to do is put it down even though somebody else could argue that it was healthy and could have coped with its' mutations.

Appendix B9: Final version of the AWARE

Reminder of Ethical Frameworks

There are three ethical frameworks relevant to veterinary and animal ethics and that are helpful to consider in this exercise – Contractarianism, Utilitarianism and Deontology. One is human centric, one balances costs and benefits, and the other is rules-based.

The human centric (or **Contractarian**) view is that morality is based on mutual agreements between people and that this mutual cooperation is in all our interests. As animals cannot make agreements, they have no moral status. Under this view, animals' moral status only matters when there is an effect on humans. Possible statements of a Contractarian viewpoint would be:

> "Zoos allow us to enjoy the experience of seeing wild animals close up."

> "Animal testing is necessary to protect human health."

The cost-benefit (or **Utilitarian**) view is that morality is about balancing harms and benefits. People with this view act in order to achieve 'the greatest good for the greatest number'. Activities which have an adverse impact on the well-being of animals may be justified if they lead to a net increase in welfare (for humans or other animals). This viewpoint considers welfare consequences for animals as well as potential benefits for humans. Typical statements of a Utilitarian viewpoint would be:

> "As long as zoos provide enriched enclosures for the animals, they have great educational value."

> "Animal testing for vital medicine is acceptable as long as animal suffering is kept to a minimum."

The rules-based (or Deontological/Animal Rights) view is that animals have moral rights and that there are fixed ethical rules that place limits on the treatment of animals. This means there are certain things we should not do to an animal whatever the consequences. For example, they do not believe it is right to kill animals for meat. Their view is that we have a duty to protect individual animals. Example statements of the deontological view would be:

> "Zoos are comparable to keeping animals in prison."

> "Animal testing should be banned."

Most people's views do not follow one framework precisely but are a mixture of parts of different frameworks. This is known as a Hybrid view.

Helpful Resources

<u>Farm Animal Welfare</u>
Government websites: **Scotland** http://www.scotland.gov.uk/Topics/farmingrural/Agriculture/animal-welfare
                     England http://ww2.defra.gov.uk/food-farm/animals/

Farmed animal welfare codes for Scotland
Cattle welfare code Scotland - http://www.scotland.gov.uk/Resource/Doc/55971/0015787.pdf
Sheep welfare code Scotland – http://www.scotland.gov.uk/Resource/Doc/55971/0015791.pdf
Horse welfare code Scotland - http://www.scotland.gov.uk/Resource/Doc/271583/0080953.pdf

Farm Animal Welfare Council: gives information on the Five Freedoms http://www.fawc.org.uk/freedoms.htm
Compassion in World Farming - gives an overview of main farming practices and associated welfare issues
http://www.ciwf.org.uk/farm_animals/default.aspx
National Equine Welfare Council provides up to date information on equine welfare issues http://www.newc.co.uk/home/

<u>Animal Ethics</u>
Animal ethics dilemma – interactive website that allows you to work through ethical dilemmas using different ethical frameworks http://ae.imcode.com/
The **BBC** provides a good overview of animal ethics and common viewpoints http://www.bbc.co.uk/ethics/animals/

For assistance, please contact: Carole Batchelor **Email:** c.batchelor.1@research.gla.ac.uk **Phone:** 0141 330 7345

1. Background information (delete options as appropriate)			
Matriculation number:		Gender: Male/Female	Nationality:
Age:	Previous degree held: Yes/No	Upbringing: Rural (farm)/ Rural (non-farm)/ Urban	
Details of establishment where undertaking this EMS placement (include type of establishment, and the number and breed of animals):			
Number of weeks previous work experience with this species (include all experience even if before vet school): None / 1-2 weeks / 3-4 weeks / 5-6 weeks / > 6 weeks		Duration of this EMS placement:	
Of 12 weeks pre-clinical EMS required by the University, how many weeks had you already undertaken before this placement: None / 1-2 weeks / 3-4 weeks / 5-6 weeks / > 6 weeks and with which species: Sheep / Cattle / Horses / Pigs / Poultry / Other Farm / Small animals / Other			

2. Animal Welfare Related Event
From your <u>own experience</u> of this placement, please choose either   1) a particular event involving human action that you feel impacted animal welfare (positively or negatively) **and had ethical implications**   or   2) a more general animal welfare issue that through human action impacted a group of animals (positively or negatively) **and had ethical implications**.   Note: Human actions towards animals often have ethical implications. When an action has ethical implications it means that different valid courses of action can benefit different parties more or less favourably depending on the action taken.
Please give an account of your chosen event/issue below: Do you think the welfare impact on the animal/s was positive or negative?*   Who was involved?   Describe the event/issue itself: What were the consequences of the event/issue?
Give your reasons for choosing this particular event/issue:

3. Personal reflection

Please choose up to **three** of the words below to describe your initial reaction/feelings having experienced this event/issue (underline as appropriate). Consider how you felt towards both the animal/s and the people involved.*

ANGRY   UNKNOWLEDGEABLE   REASSURED   FRUSTRATED   HELPLESS

EMPATHY   SHOCKED   INCOMPETENT   HELPFUL   UNINTERESTED   GUILT

CONCERNED   NERVOUS   UNCOMFORTABLE   HAPPY   UNSURPRISED

SORROW   SURPRISED   PITY   CONFUSED   INDIFFERENT   CONTENTED

REGRET   UNHAPPY   UPSET   PLEASED

If none of these words appropriately describe your feelings, please add your own here:
1)   2)   3)
If you would like to expand on your feelings please write them below:

What do you think it was about this situation that made you feel this way/have that reaction? *

Why do you think this action was taken (include any explicit justifications given by the people/person involved and why YOU thought the action was taken)? *

Thinking about the action taken, did you agree with the action? (delete/underline as appropriate) *

Yes, I would have done the same thing   No, I would have taken a different action

Yes I took the action and felt comfortable doing so   No I took the action and did not feel

comfortable doing so

I'm not sure

4. Ethical Reflection

Ethical decisions involve different parties with different interests. These affected parties can be benefited or harmed by a particular decision or action.

Identify the affected parties associated with your event/issue:

For each of the affected parties you identified, list their principle interest/s **in this situation**:

Provide an argument that supports the human actions contributing to your event/issue:

Provide an argument that challenges the human actions involved in your event/issue:

Thinking about the event/issue you chose to write about, describe what you think a supporter of the following ethical frameworks would have thought about this situation and why? What action do you think they might have taken? *

    1)   a supporter of the Utilitarian view (balancing costs and benefits)

    2)   an Animal Rights' supporter (deontologist) (believes in individual rights)

    3)   a supporter of the Contractarian view (human centric)

Which of these ethical frameworks does your own personal view most closely resemble? (delete as appropriate)

    Contractarian   Utilitarian   Deontologist   Hybrid *

Please give reasons for your choice:

---

5. Round up

Was this the first time you had seen such an event/issue?   Yes/ No

Did you share your feelings about this event/issue at the time? Yes/ No *

If yes, with whom?

Please sum up how this placement affected you. For example, did it have any impact on your views or attitude toward farming practices, animal welfare or accepted practice? How would it affect your actions/behaviour in the future? *

Did you consider how in the future you might deal with a similar situation? Yes/No *
If yes, describe what you might do:

THANK YOU FOR TAKING THE TIME TO COMPLETE THIS EXERCISE

* indicates where changes were made to wording and prompts following the pilot study

Appendix C1: Online feedback survey (2011)

Introductory questions

1. Gender:

Male   Female

2. Age:

3. Nationality:

4. Do you already hold a degree?

Yes   No

5. How many times have you completed the Animal Welfare Associated Reflective Exercise?

1   2   3   > 3

6. Which species did you write about when you completed the AWARE/s?

Sheep   Dairy Cattle   Beef Cattle   Horses

7. Which type of practice would you like to work in once you graduate?

Small Animal   Farm Animal   Equine Mixed Other Undecided

Learning experience

8. Before starting vet school, how much time had you spent doing work experience on farms and stables?

None   1-2 weeks   3-6 weeks   7-12 weeks   >12 weeks

9. Taking into account your previous farm experience, how much do you expect to learn from pre-clinical EMS?

Nothing   A little   A moderate amount   Quite a lot   A great deal

10. Listed in the table are five learning objectives for pre-clinical EMS. Please rate how much you feel completing the AWARE helped you towards meeting these learning objectives:

	Not at all	A little	A moderate amount	Quite a lot	A great deal
To gain practical experience in animal handling and husbandry	☐	☐	☐	☐	☐
To gain insights into the workings of farms and other animal industries	☐	☐	☐	☐	☐
To link theory with practice	☐	☐	☐	☐	☐
To develop interpersonal skills	☐	☐	☐	☐	☐
To encourage you to reflect on your experiences and record them concisely	☐	☐	☐	☐	☐

Pre-EMS teaching

11. Thinking back to the EMS preparatory session, I feel:

	Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly disagree
it taught me new knowledge	☐	☐	☐	☐	☐
the Moodle course was easy to follow	☐	☐	☐	☐	☐
the session provided all the information needed to complete the AWARE	☐	☐	☐	☐	☐
it gave worked examples which were especially useful	☐	☐	☐	☐	☐
I would rather be given this introductory session in a traditional lecture based format	☐	☐	☐	☐	☐

12. I thought the introductory lecture on ethics and ethical frameworks (in the EMS preparatory session) was:

	Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly disagree
too complex	☐	☐	☐	☐	☐
of no interest to me	☐	☐	☐	☐	☐
useful for helping to write my reflection	☐	☐	☐	☐	☐
relevant to veterinary medicine	☐	☐	☐	☐	☐
relevant for farm placements	☐	☐	☐	☐	☐

13. In the preparatory teaching session, we asked you to read a research scenario and then list questions you thought should be considered before deciding whether to progress with the research or not. We now want to know if, and how, your thinking has changed. Please read the scenario below.

A research group is looking for funding to breed a new strain of transgenic "mini-pig" that could be used to provide kidney transplants "to order" and help thousands of people in need. The pigs will be genetically modified so that their organs are accepted by the human body instead of being immediately rejected. This will be done by breeding genes into the pigs to reduce rejection by the human immune system. However, genetically modifying large animals is a difficult and invasive process.

Please list up to five questions you believe should be considered in order to make a decision on whether the research should go ahead or not?

14. After having considered the scenario above, do you think the research should go ahead?

Yes   No   Not sure

Completion of the AWARE

15. On the completion of the AWARE itself,

	Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly disagree
I liked that there was a free choice of the event/issue to write about	☐	☐	☐	☐	☐
I found AWARE difficult to complete	☐	☐	☐	☐	☐
I found it difficult to identify an issue/ event to reflect on	☐	☐	☐	☐	☐
I was apprehensive of writing negative comments about other people's actions	☐	☐	☐	☐	☐
I felt uncomfortable including my personal feelings	☐	☐	☐	☐	☐
It was helpful that I could refer back to the resources on Moodle when needed	☐	☐	☐	☐	☐

16. Having reflected on my particular event/issue, I felt more aware of:

	Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly disagree
animal welfare issues on farms	☐	☐	☐	☐	☐
the pressures on farmers	☐	☐	☐	☐	☐
my feelings about the event/issue	☐	☐	☐	☐	☐

17. Having completed the AWARE, I felt better able to:

	Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly disagree
recognise animal welfare issues	☐	☐	☐	☐	☐
recognise ethical issues	☐	☐	☐	☐	☐
reflect on your experiences	☐	☐	☐	☐	☐
respect others viewpoints	☐	☐	☐	☐	☐

18. I used the welfare codes in the resource section to help me identify a suitable issue

Yes   No

19. Any other comments you would like to add about AWARE not covered by the questions above

Appendix C2: Vignette used in pre-TESS

Read the following scenario and then list up to **five** questions YOU believe should be considered when making the decision whether to start the research or not. A research group is planning a project to create a cow that would produce milk containing a protein that could be used to treat patients with cystic fibrosis. Other pharmaceutical methods to produce this protein have not been successful or they have been very expensive. The plan is to introduce a new gene from another animal into the genetic sequence of the cow which directs the production of the mammary gland to change it from producing normal milk into producing a pharmaceutical milk containing the desired proteins. The new gene will be introduced by nuclear transfer, a technique also used in cloning. The group hopes to develop its research findings into a commercial product.

After having considered the scenario above, do you think the research should go ahead?

Yes   No   Not sure

Appendix C3: Categorisation for TESS

Category	Sub-category	Definition
Scientific	Scientific	Purely scientific questions e.g. numbers of animals needed, how often cows will be milked, what will they be fed.
	Economical	Reference to the economics of the situation or profits/ expenditure.
	Previous research	Reference to what previous research has been done.
	Commercial gain	Reference to commercial gains for pharmaceutical company
	Cost	Any reference to costs of study
	Heritability	Questions around the heritability of the gene
	Chance of success	Reference to the likelihood of success
	Safety of product	Questions around the safety of the product for human use
	Complications	Questions as to whether there could be complications following this technique
Ethical basis	Philosophical	Philosophical questions about whether things are ethically right or whether we have the right to do certain things
	Balancing benefits	Reference to the balancing of costs (harms) and benefits for either humans or animals
	Social acceptance	Questions about how the public would react to this procedure
	Alternatives	Questions as to whether there are alternatives that could be used instead of the animals (but general statements not relating to lesser species/other species)
	Species	Specific reference to the use of other species as an alternative (usually a species considered to be of lower moral status)
Animal Welfare	Animal costs	Reference to costs to the animal such as negative effects
	Animal health	Specific references to the animal's health, or increased susceptibility to disease
	Animal side effects	Exact words 'side effects' used in relation to animal
	Animal welfare	Reference to the animal's welfare or wellbeing, change from norm in husbandry/treatment, including references to the five freedoms and stress. Excludes mention of health or side effects
	Animal benefits	Benefits for animals from treatment
	Outcome for cows	Questions on what will happen to the animals in the long term or after the research
	Suffering	Any reference to 'suffering' or 'harm' to the animal
Effects on humans	Human benefits	Reference to whether the treatment will benefit humans
	Size of benefit	Specific reference to the size of the benefit for humans
	Human costs	Questions as to whether there could be any negative effects on the patients
	Human side effects	Unexpected effects on humans, not explicitly stated as negative
	Long term implications	Reference to long term effects on humans (both positive and negative)
Not categorised		Questions that do not make sense or statements that are not questions

Appendix C4: Classification of incidents impacting animal welfare (2011)

The table below shows the classification of incidents impacting animal welfare chosen by students completing an AWARE following a PC-EMS placement on a sheep farm in 2011.

Incident	Frequency	Welfare impact	Frequency	Theme	Frequency
Issue	37	Negative	22	Accommodation	3
				Feed and Water	1
				Health	10
				Husbandry Practices	6
				Management	3
		Positive	4	Breeding	2
				Feed and water	1
				Management	1
		Both	9	Husbandry Practices	10
Event	44	Negative	30	Breeding	4
				Health	19
				Management	3
				Stockmanship	4
		Positive	12	Health	8
				Husbandry Practices	3
				Stockmanship	1
		Both	2	Health	1
				Husbandry Practices	1

Appendix D1: WEAVE and AWARE logos

WEAVE logo

AWARE logo

Appendix D2: WEAVE welcome screen

Appendix D3: WEAVE online feedback survey (2012)

Introductory questions

1. Gender:

Male   Female

2. Do you already hold a degree?

Yes   No

3. How many times have you completed the Animal Welfare Associated Reflective Exercise?

1   2   3   >3

4. Which species did you write about when you completed the AWARE/s?

Sheep   Dairy Cattle   Beef Cattle   Horses

5. Did you complete the Five Freedoms Farm Report?

Yes   No

Learning experience

6. Taking into account your previous farm experience, how much do you expect to learn from pre-clinical EMS?

Nothing   A little   A moderate amount   Quite a lot   A great deal

7. Listed in the table are five learning objectives for pre-clinical EMS. Please rate how much you feel completing the WEAVE package (both Partnerships in EMS and AWARE) helped you towards meeting these learning objectives:

	Not at all	A little	A moderate amount	Quite a lot	A great deal
To gain practical experience in animal handling and husbandry	☐	☐	☐	☐	☐
To gain insights into the workings of farms and other animal industries	☐	☐	☐	☐	☐
To link theory with practice	☐	☐	☐	☐	☐
To develop interpersonal skills	☐	☐	☐	☐	☐
To encourage you to reflect on your experiences and record them concisely	☐	☐	☐	☐	☐

Pre-EMS teaching

8. Thinking back to the EMS preparatory session (in the computer cluster), I feel:

	Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly disagree
the AWARE taught me new knowledge	☐	☐	☐	☐	☐
Partnerships in EMS taught me new knowledge	☐	☐	☐	☐	☐
the Moodle courses were easy to follow	☐	☐	☐	☐	☐
I would rather be given this introductory session in a traditional lecture based format	☐	☐	☐	☐	☐

Completion of the AWARE

9. On the completion of the AWARE itself,

	Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly disagree
I liked that there was a free choice of the event/issue to write about	☐	☐	☐	☐	☐
I found the AWARE easy to complete	☐	☐	☐	☐	☐
I found it difficult to identify an issue/event to reflect on	☐	☐	☐	☐	☐
I didn't understand the concept of reflection	☐	☐	☐	☐	☐
I was apprehensive of writing negative comments about other people's actions	☐	☐	☐	☐	☐
I felt uncomfortable including my personal feelings	☐	☐	☐	☐	☐
It was helpful that I could refer back to the resources on Moodle when needed	☐	☐	☐	☐	☐

10. Having reflected on my particular event/issue, I felt more aware of:

	Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly disagree
animal welfare issues on farms	☐	☐	☐	☐	☐
the pressures on farmers	☐	☐	☐	☐	☐
my feelings about the event/issue	☐	☐	☐	☐	☐

11. Having completed the AWARE, I felt better able to:

	Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly disagree
recognise animal welfare issues	☐	☐	☐	☐	☐
recognise ethical issues	☐	☐	☐	☐	☐
reflect on my experiences	☐	☐	☐	☐	☐
respect others viewpoints	☐	☐	☐	☐	☐

12. I used the welfare codes in the resource section to help me identify a suitable issue

Yes   No

Completion of Partnerships in EMS

13. I thought the Partnerships in EMS computer programme was:

	Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly disagree
easy to follow	☐	☐	☐	☐	☐
engaging	☐	☐	☐	☐	☐
relevant to my studies	☐	☐	☐	☐	☐

14. In the animal observation section,

I fully understood the objective measures of behaviour (e.g. lying, walking):   Yes   No

I fully understood the subjective measures of behaviour (slider and adjectives):   Yes   No

15. Do you feel that the Partnerships in EMS computer programme improved your:

	Strongly agree	Agree	Neither agree or disagree	Disagree	Strongly disagree
knowledge of animal welfare?	☐	☐	☐	☐	☐
knowledge of welfare management strategies?	☐	☐	☐	☐	☐
ability to assess welfare needs through the appearance of the animal?	☐	☐	☐	☐	☐
ability to assess welfare needs through the behaviour of the animal?	☐	☐	☐	☐	☐

16. Any other comments you would like to add about WEAVE not covered by the questions above

Appendix D4: Reflection on Professional Ethics (ROPE)

This exercise is for use following clinical EMS placements. It aims to encourage you to reflect on your own experience in a structured way, taking account of the ethical issues involved. The exercise should be completed within two weeks of finishing your placement. Please complete all sections.

Useful information

The ten guiding principles of professional conduct

1. Your clients are entitled to expect that you will:

a) make animal welfare your first consideration in seeking to provide the most appropriate attention for animals committed to your care

b) ensure that all animals under your care are treated humanely and with respect

c) maintain and continue to develop your professional knowledge and skills

d) foster and maintain a good relationship with your clients, earning their trust, respecting their views and protecting client confidentiality

e) uphold the good reputation of the veterinary profession

f) ensure the integrity of veterinary certification

g) foster and endeavour to maintain good relationships with your professional colleagues

h) understand and comply with your legal obligations in relation to the prescription, safe-keeping and supply of veterinary medicinal products

i) familiarise yourself with and observe the relevant legislation in relation to veterinary surgeons as individual members of the profession, employers, employees and business owners

j) respond promptly, fully and courteously to complaints and criticism

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The Four Principles (Beauchamp and Childress, 2009)

The four principles are widely used in medical ethics and can be similarly applied in veterinary ethics.

The four principles are Respect for autonomy, Beneficence, Non-maleficence and Justice.

Respect for autonomy: Respecting the decision-making capabilities of autonomous persons. In veterinary ethics, this would be concerned with the client's autonomy as the patient is not able to make reasoned informed choices.

Beneficence: To do good; involves balancing the benefits of treatment against the risks and costs.

Non-maleficence: To do no harm; if the treatment involves some harm, the harm should not be disproportionate to the benefits of the treatment.

Justice: Be fair; distribute benefits and costs fairly and treat patients in similar positions in a similar way.

Virtue ethics

To be virtuous means to conform to moral and ethical principles. Virtue ethics is concerned with your moral character and a person of good moral character is someone who has admirable personal qualities, e.g. honesty, integrity, compassion, respect, toleration, and courage, and uses these qualities in ethical decisions.

Helpful Resources -RCVS website: http://www.rcvs.org.uk/advice-and-guidance/guide-to-professional-conducts-for-veterinary-surgeons/1b-the-ten-guiding-principles/
The **BBC** website has overviews of both virtue ethics http://www.bbc.co.uk/ethics/introduction/virtue.shtml and the Four Principle approach http://www.bbc.co.uk/ethics/lying/lying_1.shtml#h6

Data from this exercise may be used to assist in a research project within the University of Glasgow. The data used will be anonymous. If you do not wish your data to be used in this project please tick this box. ☐

Matriculation Number: _____

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1. Ethically Relevant Event

From your own experience of this placement, please choose either
1) a specific event involving a vet's action that you feel had ethical implications for another person or other people
or
2) a more general issue witnessed in the practice that you felt had ethical implications for another person or other people.
Note: Professional actions often have ethical implications. When an action has ethical implications it means that different valid courses of action can benefit different parties more or less favourably depending on the action taken.

Please give an account of your chosen event/issue below using the prompts as a guide:
Who was involved?

Describe the event/issue itself:

What were the consequences of the event/issue?

Give your reasons for choosing this particular event/issue:

---

3. Personal reflection

Please choose up to **three** of the words below to describe your initial reaction/feelings having experienced this event/issue (underline as appropriate).

ANGRY	UNKNOWLEDGEABLE	REASSURED	FRUSTRATED
HELPLESS	EMPATHY	SHOCKED	INCOMPETENT
HELPFUL	UNINTERESTED	GUILT	CONCERNED
NERVOUS	UNCOMFORTABLE	HAPPY	UNSURPRISED
SORROW	SURPRISED	PITY	CONFUSED
INDIFFERENT	CONTENTED	REGRET	UNHAPPY
UPSET	PLEASED		

If none of these words appropriately describe your feelings, please add your own here:
1)   2)   3)
If you would like to expand on your feelings please write them below:

What do you think it was about this situation that made you feel this way/have that reaction?

Why do you think this action was taken (include any explicit justifications given by the people/person involved and why YOU thought the action was taken)?

Thinking about the action taken, did you agree with the action? (delete as appropriate)

Yes, I would have done the same thing   No, I would have taken a different action

Yes I took the action and felt comfortable doing so   No I took the action and did not feel comfortable doing so

I'm not sure

4. Ethical Reflection

Ethical decisions involve different parties with different interests. These affected parties can be benefited or harmed by a particular decision or action.

Identify the affected parties associated with your event/issue:

For each of the affected parties you identified, list their principle interest/s **in this situation**:

Provide an argument that supports the human actions contributing to your event/issue:

Provide an argument that challenges the human actions involved in your event/issue:

Thinking about the event/issue you chose to write about, describe if and how the action goes against the 10 guiding principles provided by the RCVS?

Describe how the person/people involved in your situation acted with regards to:
Beneficence:

Non-maleficence:

Respect for autonomy:

Justice:

What virtues do you think the vet/s involved adhered to and/or went against?

5. Round up

Was this the first time you had seen such an event/issue?   Yes/ No

Did you share your feelings about this event/issue at the time? Yes/ No
If yes, with whom?

Please sum up how this placement affected you. For example, did it have any impact on your views or attitude toward veterinarians in practice, professional conduct or accepted practice? How would it affect your actions/behaviour in the future?

Did you consider how in the future once you are a practicing vet, you might deal with a similar situation? Yes/No

If yes, describe what you might do:

Please use the space below if you would like to add any other comments, for example, on other ethical issues experienced during your placement.