



## Ethnography in the Danish Veterinary Learning Environment

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### Abstract

*The overall objective of this project is research-based development, implementation and evaluation of a game-based learning concept to be used in the veterinary education. Herd visits and animal contact are essential for the development of veterinary competences and skills during education. Yet veterinary students have little occasion to reach/attain a proper level of confidence in their own skills/abilities, as they have limited "training-facilities" (Kneebone & Baillie, 2008). One possible solution might be to provide a safe, virtual environment (game-based) where students could practise interdisciplinary clinical skills in an easily-accessible, interactive setting. A playable demo using Classical Swine Fever in a pig herd as an example has been produced for this purpose. In order to tailor the game concept to the specific veterinary learning environment and to ensure compliance with both learning objectives and the actual learning processes/procedures of the veterinary students, the project contains both a developmental aspect (game development) and an exploration of the academic (scholastic) and profession (practice) oriented learning context.*

*The initial phase of the project was a preliminary exploration of the actual learning context, providing an important starting point for the upcoming phase in which I will concentrate on research-based development, implementation and evaluation of a game-based virtual environment in this course context. In the academic (scholastic) and profession (practice) oriented learning context of a veterinary course in Herd Health Management (Pig module), ethnographic studies have been conducted by using multiple data collection methods; participant observation, spontaneous dialogues and interviews (Borgnakke, 1996; Hammersley & Atkinson, 2007). All course related activities in the different learning spaces (commercial pig herds, auditoriums, post-mortem examinations, independent group work) were followed. This paper will describe the project and it will focus in particular on the initial exploration of the veterinary learning context in terms of theory, empirical data and the methods.*

### Keywords:

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# ***Professional Pig Practice***” - development, evaluation and documentation of a game-based-learning concept; an interactive approach of practising veterinary clinical skills during virtual herd visits.

## **Background**

Herd visits and real-life animal contact during education in Veterinary Medicine are extremely important for training of clinical skills. However, the high costs associated with clinical courses and the increase in student uptake means that actual contact-time is very limited. Hence, veterinary students have little chance to practise and reach a proper level of confidence in their own skills/abilities. Inexperience and anxiety combined with the challenge of interdisciplinary thinking in order to employ elements of previously acquired basic theoretical knowledge from a wide range of subjects can be overwhelming. It is therefore quite clear that appropriate, clinical “training-facilities” are urgently needed. Efforts have been made to identify teaching methods that might assist and facilitate learning processes in veterinary clinical courses. Current methods include the use of computer animated anatomical 3D programs, skill-laboratories, traditional e-learning and simulated patient case-based problem orientated exercises, but so far there has been a lack of training methods involving herd visits (De Bie & Lipman, 2012). One possible solution might be to provide a safe, virtual environment where students could practise their interdisciplinary clinical skills in an easily-accessible, interactive game-based setting.

The efficiency of game-based-learning (GBL) in terms of being engaging and motivating (Mann et al. 2002) together with improving academic performance (Blunt, 2008; Kanthan et Senger, 2011) has been advocated. Advances in technology allow the programming of complex game-situations with a high degree of interaction. Furthermore, the majority of today’s students are believed to be digital natives, thus they possess the necessary prerequisites to exploit GBL to the full (Prensky, 2001).

The inclusion of GBL as a part of the Veterinary Curriculum requires further research, especially regarding how, and under what conditions, games might most effectively be integrated into the learning process in order to maximize learning potential and achieve learning goals. Also, the learning outcome of a specific learning game must be assessed and evaluated.

Therefore, the aim of this PhD project is to develop, describe, implement and evaluate a GBL concept for use in clinical courses.

A project group was set up as a collaboration between the departments of Large Animals Sciences and Veterinary Disease Biology (SUND-UC), Media, Cognition and Communication (HUM-UC) and external software developers (Fenris Film & Multimedia Ltd). In the group, veterinary research and professional skills, pedagogical disciplines and computer science are combined. The main area of the PhD study being development, evaluation and scientific documentation of a GBL concept.

Using pig herds as model, learning modules of important pig diseases will be developed, implemented and evaluated in pig-related courses. To demonstrate the product and also to document sufficient competences and collaboration

skills within the project group, a playable demo using Classical Swine Fever as example has been produced.

Short game description

Students draw a herd at random (with a well-defined disease or problem). The visit (game) starts at the stable door where certain safety procedures should be applied to avoid transfer of pathogens (change clothes, wash hands etc.). There are several possible lines of dialogue with the farmer, some of which will provide/lead to important clues, while others will be of less relevance/no relevance. By selecting a pig pen (point and click) a video sequence will show typical clinical signs and behavioural patterns of affected pigs. Certain animals can be selected for closer examination, and eventually necropsy, where close-ups will be provided and students have to notice and identify pathological changes. It will be possible to select material for laboratory examinations and receive the results i.e. of culturing during the visit. The visit is concluded by selecting the correct diagnosis and prescribing appropriate treatment and/or action. The game design resembles adventure- and simulation games and students obtain points by correct actions.

*Figure 1. Instruction*

### **Research Aims**

The aim of the current research is the development, implementation and evaluation of game-based learning.

The key research questions relate to game-based learning as a didactical unit as well as investigations in the existing learning context. Further, important factors believed to influence the establishment of an effective learning environment using GBL will be considered; game-design, motivational factors, entertainment and professional level.

By using ethnographic and qualitative evaluative approaches, the research project will involve close-up/in-depth studies of the learning processes affected when using GBL in veterinary clinical courses. Against this background, exemplary analysis of game-based learning situations will be developed, the aim of which will be to prompt reflection on GBL as one possible way of establishing a link between theory and practice in clinical veterinary courses. Further, the analysis will cast light both on teaching and learning strategies as well as significant aspects allowing complex clinical problems to be identified and solved and social interaction to be practised.

Throughout the project and the empirical phases, the veterinary master course Practical Herd Health Management and Meat Inspection will form the basis of the project. There will be intensive fieldwork with observations and interviews in the one-week course, called the “Pig-Week”, with clinical work and herd health-related projects on swine farms. The course is taught four times per year with groups comprising approximately 45 students per course. The course is described in terms of content, learning outcomes, teaching methods and assessment in the official course description (<http://kurser.ku.dk/course/svek13006u/2013-2014>) (In Danish Only).

The GBL concept will be developed, implemented and evaluated within the framework of this “test course” with approximately 200 students per year and

using the learning/teaching environment as a research field. In addition, focus groups comprising students who are not associated with the course are included in the study.

### **Piloting ethnographic studies in the Danish Veterinary learning environment**

Empirical studies conducted in the Danish veterinary educational environment are very sparse. An exception is the pioneering PhD project dealing with emotions in the Danish veterinary learning environment which was defended in 2011 (Langebæk, 2011). Internationally, veterinary institutions show a greater interest in educational research, and the number of studies has increased. To my knowledge, the Danish veterinary learning environment has never been explored by using an ethnographic approach. In an endeavor to gain new insights and a more complete understanding of the actual “inner culture” of veterinary learning and teaching in the different learning contexts, it is essential to turn to empirical studies. Borgnakke has emphasized the necessity of empirical studies within the fields of university pedagogical practice (Borgnakke 1996, Borgnakke 2011). Traditional fieldwork and participant observation following students/teachers in the different learning contexts shows considerable benefits in terms of studying the dynamic processes of learning and teaching (Borgnakke, 2013). However, it is advisable to follow the complex learning processes of the participants (students/teachers) through the different contexts in “real time/rhythm” of the actual course progression to fully exploit the strengths of the ethnographic methods (ibid). The first phase of this project (starting with ethnographic mapping of the veterinary clinical learning environment) concentrates on piloting (pioneering) ethnographic studies in the “Pig-week”. Entrance into the research field is driven by the fundamental basic educational ethnographic questions: How is usual teaching practice in the “Pig-week”?

Methodological, the ethnographic studies are inspired by educational research and evaluation research using a variety of methods: participant observation, spontaneous dialogues, interviews, photos, videos and document collection (Borgnakke, 1996, Borgnakke, 2013, Hammersley & Atkinson, 2007). In what follows, a brief introduction of the structure of the Danish veterinary education is given in order to place the “Pig-week” in the context of the Danish veterinary education.

### **Organization and structure of the Veterinary Education in Copenhagen**

In Denmark, the qualification and the title Doctor of Veterinary Medicine (DVM) allowing graduates to apply for authorization as a practicing veterinarian can be obtained only at the University of Copenhagen. The Danish Ministry of Food, Agriculture and Fisheries grants authorization. The Danish veterinary authorization is a “one-purpose authorization” (no specialization). The School of Veterinary Medicine and Animal Science (SVMA) (<http://vetschool.ku.dk/om/>) is responsible for the veterinary programme. The total number of students has increased in recent years and in 2013, 180 new veterinary students were admitted on the veterinary bachelor programme. Of the 180 students accepted in 2013, 154 were woman. Prerequisite for entering the veterinary programme is a secondary school grade point average of 10.7 (2013 - Danish Ministry of Higher Education and Science: [http://www.ug.dk/flereomraader/maalgrupper/videregaende\\_uddannelse/kot-tal\\_for\\_alle\\_videregaende\\_uddannelser.aspx](http://www.ug.dk/flereomraader/maalgrupper/videregaende_uddannelse/kot-tal_for_alle_videregaende_uddannelser.aspx)). There are no entry requirements regarding previous experience with animals.

The Veterinary curriculum consists of a bachelor’s degree (3 years) and a (DVM) master’s degree (2.5 years) in concordance with objectives of the Bologna Declaration of 1999 and the Danish Law of Universities (legal order

no. 367 of 25 March 2013 – in Danish only).  
<https://www.retsinformation.dk/Forms/R0710.aspx?id=145366>)

The structure of the study for both bachelor- and master programs divides the year into four blocks of nine weeks, each with an interim week in between. Each block has a value of 15 ECTS, thus 180 ECTS for the Bachelor degree and 150 ECTS for the Master degree (Jensen, 2006). Exams are held at the end of each block (week 9).

The following figures show the current course content of each block in the veterinary Bachelor and Candidate program. All courses, with the exception of the elective differentiation courses (light green), are compulsory if students are to obtain the DVM title.

<http://studier.ku.dk/bachelor/veterinaermedicin/undervisning-og-opbygning/>

<http://studier.ku.dk/kandidat/veterinaermedicin/undervisning-og-opbygning/>

Year	Block 1	Block 2	Block 3	Block 4
1	Veterinary Ethics and Philosophy of Science	Cytology and Basic Histology	Veterinary genetics	Veterinary Anatomy and Physiology - part 2
	Chemistry and Biochemistry	Veterinary Anatomy and Physiology - part 1		
2	Immunology, General Pathology and Pathofysiology	Infection Microbiology	Basic Pharmacology, Toxicology and Pharmacy	Microbiel Food Safety
			Basic Statistics and Epidemiology	Applied Pharmacology
3	Special Pathology and Poultry Diseases		Large Animal Basic Clinical Theory	Veterinary Jurisprudence and Laboratory Animal Science
	Animal Nutrition	Small Animal Basic Clinical Theory	Herd Health and Public Health	Veterinary BSc project

Year	Block 1	Block 2	Block 3	Block 4
1	Medicine, surgery and reproduction – small animals		Practical Herd Health Management and Meat Inspection (ROTATION I) “ <b>PIG-WEEK</b> ”	General Clinical Practice – Large animals (ROTATION II)
	Medicine, surgery and reproduction – large animals		Veterinary Paraclinics (ROTATION I)	
2	General Clinical Practice – Small animals (ROTATION III)	Veterinary Imaging (Rotation IV)	Veterinary Jurisprudence and Animal Welfare Assessment (Compulsory e-learning course for all students)  Differentiation course or Veterinary MSc thesis	
		Emergency, Obstetrics, Critical Care and Clinical Anesthesiology (ROTATION IV)		
3	Veterinary Jurisprudence and Animal Welfare Assessment (Compulsory e-learning course for all students)  Differentiation course or Veterinary MSc thesis			

The first 1½ years of the candidate programme comprise compulsory courses some of these being rotation courses with 45 students in each rotation. In the period of participating in the rotation courses, students choose (one) from four different options of differentiation courses: Biomedicine (35 places), Equine clinic track (25 places), Advanced companion animal track (45 places) and Herd health management (75 places). Having completed the Veterinary Master (Candidate) programme students will have received not only the required omnivalent basic training but also a higher starting competence level in the area of one of the specified differentiations (Jensen, 2006).

Most bachelor courses consists mainly of lectures. Furthermore, students participate in various exercises; reading, writing and statistical exercises, practical laboratory work, dissections, microscopy etc. Contact with live animals is limited in the bachelor programme and is restricted to basic animal handling courses. However, these courses do not include handling of pigs. In the Master (Candidate) programme the orientation towards the veterinary clinical practical profession can be seen in the clinical practical courses, where students engage in clinical practical veterinary practice. During Rotation II, III and IV periods of various length in the clinical practical context of the University Hospitals (Companion Animals and Large animals) are included. Production animals especially pigs are not hospitalized in veterinary practice. For the proportion of students who do not choose the Herd Health Management option/differentiation course, the “pig-week” represents the final practical professionally orientated part of the veterinary programme regarding pig diseases and herd health management in pig herds before graduation and authorization.

## **“Pig-week”**

The “pig-week”, a part of rotation I (Light blue on figure) constitutes the empirical basis for this study. An estimate of between 15-20 % of all students entering “Pig-week” have neither visited a commercial pig herd, nor encountered a live diseased pig. Previous clinical courses involving live pigs are placed at the beginning of the Master programme in block 1+2 before “Pig-week” (Medicine, surgery and reproduction – small animals/large animals). These are practical courses in surgical technique (anesthetic procedures and minor surgical procedures) and technique of basic clinical examination (examination of healthy pigs and medical record keeping). Animals in these courses are brought in for teaching purposes and hospitalized in the University Hospital (with a status of experimental animals); hence, they are not presented to students in the herd context in which students will encounter pigs in future veterinary practice. The student level of clinical practical experience (other species) upon entrance into the “pig-week” varies according to whether the student begins with rotation I, II, III or IV. The official course catalogue overall purpose description regarding the “pig-week” is: “The purpose of the course is for the student to obtain the knowledge, skills and competencies required to fulfil the demands of the herd health advisory service and meat inspection as required by Danish legislation” (Translated by author).

The pig week (5 days) is designed and planned to replicate what a pig veterinarian would do in practice - from clinical examination of individual patients, necropsies and diagnostic testing to an “advisory-visit” where the herd is evaluated as an epidemiological entity and all elements of legislation are considered. During the five-day course students alternate between academic/scholastic learning contexts at the university and practice-oriented learning contexts in commercial pig herds. At the university, students attend lectures, classroom seminars, post-mortem examinations, take part in group work, give presentations and participate in discussions. In commercial pig herds students undertake clinical practical work related to herd health management in pig herds. During the course, each student visits the same herd on two course days (day one and day four).

A permanent teacher (Associate Professor of Pig Diseases) is responsible both for planning and teaching the course. In most courses, a Phd student from the pig research area participates in teaching activities when visiting commercial herds. Further, the advisory herd veterinarian associated with commercial visit-herds is present at the first visit. “Pig-weeks” often begins with the following introduction to the course:

This is an applied subject, where you are supposed to use what you have learned so far. It is a very practical oriented course. We are to do what veterinarians do. You have to use the knowledge you have gained from immunology, pathology, epidemiology etc.  
(Field notes, permanent teacher, course introduction, Nov 2013)

Ethnographic studies were conducted in three consecutive courses in which participants were followed in original time and rhythm through all different learning contexts of the “Pig-week”.

The piloting studies have included experimenting with different observational methods. An approach inspired by Borgnakke focusing on original statements from the participants was adapted from the beginning (Borgnakke, 1996). However, it emerged that observations in commercial pig herds were challenging. In the very noisy environment and in the tight narrow confined physical spaces found in pig herds, it was hard to hear what students were saying and it was equally hard to see what they were doing. To a certain extent those difficulties were overcome by using a small video recorder to capture action - while leaving the observer to focus on spoken words. However, my

observational challenges show a striking similarity to the challenges facing veterinary students engaging in the clinical practical learning environment of the “pig-week”.

As person number 25 in a line of students in a noisy pig herd, I was trying to make sense of the words of the teacher in the front end of the row. She was talking about important veterinary focus points in the different sections of the herd. I was unable to hear the words. My observation of students in the back of the row reminded me of children playing the game “Chinese Whispers”. In this game, a sentence has to keep wording, content and meaning when whispered from person to person throughout a full circle a people. Some students were choosing to not “participate in the game” by simply not listening – but rather talking to each other instead. Others were left to form their own interpretations of the incoherent sentences as these were passed on from the person in front.

(Personal memo based on field notes, first herd visit, November 2013).

The pilot studies have resulted in a voluminous amount of empirical data, which can be approached from several analytical angles. Some of the initial reflections arising from the first empirical material are outlined in what follows – these reflections provide background for continuous reflection and new upcoming focused studies in the field.

### **Characteristic learning strategies – dominated by the learning paradigm**

Veterinary education comprises both theoretical- and practical/clinical aspects. However, the mandatory part of the educational programme is dominated by theoretical courses. This is especially the case, when considering the herd health-related disciplines, in which there are few practical/clinical profession orientated elements in the education. Doing fieldwork – being in the field, close to the ongoing teaching practice of the “pig-week”, the challenges and complexity of the different contexts of the “pig-week”, were overwhelming. Indeed “voices” from the different actors in the field have highlighted a gap between theory and practice. Surprisingly, and of particular interest, the field points to the existence not only of a gap between theory and practice but also between “real veterinary practice” and “veterinary practice in clinical courses”. This could pose a challenge for the university-based profession-oriented veterinary education.

Initial observations and descriptions of the veterinary learning/educational context(s) have revealed a significant articulation of the theory of Constructive alignment and deep- and surface learning strategies (Ramsden/Biggs) from/in the field. Official veterinary course descriptions, descriptions of educational structure/content and the choice of “Constructive alignment – teaching for quality at the university” (Biggs and Tang, 2007) as the textbook in “educating” veterinary educators, reflect the interpretation of the “Ramsden/Biggs tradition” found within the field itself. Intended learning outcomes (ILOs), SOLO taxonomy (Structure of the Observed Learning Outcome), alignment of teaching/learning activities (TLAs), alignment of assessment tasks (ATs) and the concepts of deep- and surface learning strategies are firmly established in both course descriptions and the mindsets of Danish veterinary educators.

Borgnakke (2011) describes the Ramsden/Biggs tradition (“Learning-paradigm”) as a strong normative paradigm (Kuhn’s theory of paradigms) focusing on individual learning and learning strategies (Borgnakke, 2011). Further, Borgnakke questions a possible shift approaching “the learning question” - moving from a pedagogical-psychological individual concept of learning towards a more sociological-anthropological approach – perhaps indicating a shift in paradigms. The strong presence of the concepts of the “learning-paradigm” in the veterinary learning environment and a possible

upcoming shift in paradigms inspire to a broadened outlook in conjunction with theories of “situated learning” and learning as social practice focusing on the principles of apprenticeship (Lave & Wenger, 1991, Wenger, 1998, Nielsen & Kvale, 1999). In addition, Dreyfus & Dreyfus (1999) with their five-stage model of skills acquisition, provide a relevant theoretical framework in which acquisition of clinical skills and “movement” of theoretical knowledge towards practical application and clinical decision making/problem solving can be discussed. Further, inspired by Bo Jacobsen (1981) and his educational-sociological analysis (Kuhn/Bernstein) of medical- and Danish studies at the University of Copenhagen, the Danish veterinary education can be described as having a fixed-structure. This description finds possible usefulness in further analysis.

### **Following the process focusing on the development of demo**

Following the process of development, implementation and evaluation of GBL and “Professional Pig Practice”, the next phase in the project will concentrate on how to prepare the playable demo (Classical Swine Fever) and present it to students. The plan is that the preparation of the existing demo will incorporate results from focus-group interviews (game design, game play, motivational aspects etc.). The prepared version of the game will be analyzed as a game (narrative patterns, content, intentions, didactical design and the embedded learning strategies) and followed when used as game based learning (gaming situations). Up-coming questions in the next phase of the project will focus on experimenting with methods to determine how to follow students while they engage in gaming activities.

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