ZELDA – Centre for E-Learning, Didactics and Educational Research:
Publications in peer-reviewed journals.

2024

HEISE SAC, WISSING S, NERSCHBACH V, PREUSSING E, TIPOLD A, KLEINSORGEN C:
Evaluation of an Interprofessional Blended Learning Course Focusing on Communication within Veterinary Teams.
Animals 2024, 14(5), 729; https://doi.org/10.3390/ani14050729

HEISE SAC, TIPOLD A, ROHN K, KLEINSORGEN C:
Measuring Veterinarian Professions' Readiness for Interprofessional Learning in a Pre- and Post-Intervention Study.
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KANWISCHER M, TIPOLD A, SCHAPER E:
Veterinary teaching in COVID-19 times: Perspectives of university teaching staff.
Front. Vet. Sci., Volume 11 - 2024 | doi: 10.3389/fvets.2024.1386978

RICHTER R, TIPOLD A, SCHAPER E:
Identification of Parameters for Electronic Distance Examinations.
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Knowledge attainment, learning approaches, and self-perceived study burnout among European veterinary students.
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Animals 2024, 14(5), 729; https://doi.org/10.3390/ani14050729

Evaluation of an Interprofessional Blended Learning Course Focusing on Communication within Veterinary Teams.

Sylva Agnete Charlotte Heise[1], Sandra Wissing[2], Verena Nerschbach[3], Ellen Preussing[4], Andrea Tipold[2], Christin Kleinsorgen[1]
[1]E-Learning-Consulting, Centre for E-Learning, Didactics and Educational Research, University of Veterinary Medicine Hannover, 30559 Hannover, Germany
[2]Centre for E-Learning, Didactics and Educational Research, Clinical Skills Lab, University of Veterinary Medicine, 30173 Hannover, Germany
[3]Clinic for Small Animals, University of Veterinary Medicine Hannover, 30559 Hannover, Germany
[4]Lightwings Preussing, VetAcademy, 8134 Adliswil, Switzerland

Based on the importance of communication and teamwork in veterinary practice, we explored the impact of a blended learning course designed to enhance interprofessional communication skills among veterinary students and apprentice assistants. The blended learning course design included online modules, synchronous (online) seminars, and simulation training sessions. The asynchronous online elements should complement the varied schedules of different professions and meet the individual needs of participants, especially considering the challenges posed by the COVID-19 pandemic. The course structure, evaluations, and outcomes were documented, showing a positive impact on knowledge gain concerning communication and self-assessment in communication skills. In the pretest, the participants scored 43.18% correct answers to a knowledge test, whereas 71.50% correct answers were given in the posttest. Some participants indicated an improvement in the self-assessment of their skills. For example, before the training only 13.64% answered the question “How prepared do you feel regarding your communication skills for entering the profession?” with “Very good” or “Good”, versus 50.00% in the posttest. There were also only 22.73% of participants who agreed to having sufficient understanding of the roles of other professional groups, while in the posttest, 81.82% agreed. The evaluations highlighted positive feedback on the organization, learning environment, and overall course structure. However, challenges such as limited resources, especially time and financial constraints, influenced the implementation and ongoing development of the course. Subsequent runs of the course could gather more data to further improve the teaching of veterinary interprofessional communication. This ongoing data collection would

allow continuous insights into and adjustments to the teaching methods, ensuring maximum benefit for veterinary students and apprentice assistants.

Keywords: interprofessional, team communication, teamwork, communication course, interprofessional course, blended learning, flipped classroom

Animals 2024, 14(2), 229; https://doi.org/10.3390/ani14020229

Measuring Veterinarian Professions' Readiness for Interprofessional Learning in a Pre- and Post-Intervention Study.

Sylva Agnete Charlotte Heise[1], Andrea Tipold[2], Karl Rohn[3], Christin Kleinsorgen[1]

[1]E-Learning-Consulting, Center for E-Learning, Didactics and Educational Research, University of Veterinary Medicine Hannover, 30559 Hannover, Germany
[2]Clinic for Small Animals, University of Veterinary Medicine Hannover, 30559 Hannover, Germany
[3]Institute of Biometrics, Epidemiology and Information Processing, University of Veterinary Medicine Hannover, 30559 Hannover, Germany

The integration of interprofessional collaboration is becoming increasingly crucial in veterinary care settings, emphasising the need for interprofessional education (IPE) in veterinary programmes. This study explores the readiness for interprofessional learning among German veterinary students, apprentices and related occupations before and after an interprofessional communication course. It assesses the impact of this course on the participants' attitudes using the Readiness for Interprofessional Learning Scale (RIPLS). The course, offered in two iterations, combined asynchronous online modules, live seminars and practical training elements. The RIPLS was administered before and after the course to gauge attitude shifts towards interprofessional learning. Statistical analyses, including McNemar, Cohen's Kappa and exact Fisher tests, were employed to compare pre- and post-test responses. Despite challenges in participant linking, significant findings emerged between the student and apprentice groups in specific areas of the RIPLS, notably in the "Professional Identity" subscale post-course. However, correlations between face-to-face contact and RIPLS ratings were not observed, suggesting a need for more integrated interprofessional learning experiences. While some limitations in sample size and profession distribution hinder generalisability, this study indicates a high receptiveness to interprofessional learning in veterinary education, emphasising the potential for attitude changes with more interactive participation and programme adjustments.

Keywords: interprofessional, blended learning, teamwork, RIPLS, communication

Front. Vet. Sci., Volume 11 - 2024 | doi: 10.3389/fvets.2024.1386978

Veterinary teaching in COVID-19 times: Perspectives of university teaching staff.

Miriam Kanwischer[1], Andrea Tipold[2], Elisabeth Schaper[1]

[1]Center for E-Learning, Didactics and Educational Research, University of Veterinary Medicine Hannover, Foundation, Hannover, Germany

[2]Department of Small Animal Medicine and Surgery, University of Veterinary Medicine Hannover, Foundation, Hannover, Germany

The digitalization of university teaching has been taking place for many years and, in addition to traditional teaching formats such as practicals and face-to-face lectures, more and more e-learning courses have been used in veterinary education for several years. In the context of the COVID-19 pandemic, universities across Germany had to switch to an ad-hoc, purely digital summer semester. This study evaluated the experiences and implementation of the digital summer semester 2020 at the University of Veterinary Medicine Hannover (TiHo) Foundation from the perspective of the teaching staff. In addition to the technical equipment used by lecturers, this survey also focused on the effects of the digital semester on teaching and the future practicality of digital teaching formats and strategies in veterinary education. Therefore, a questionnaire was designed and distributed among lecturers involved in the digital summer semester 2020. One hundred and three completed questionnaires were evaluated. The results of the evaluation show that teachers see huge potential in blended learning as a teaching method in veterinary education. In addition, teachers were able to digitize teaching well with the available hardware and software. The teaching staff saw difficulties above all in the loss of practical training and in the digitalization of practical exercises. Teachers also needed significantly more time to plan and implement digital teaching compared to pure face-to-face teaching. In summary blended learning offers many advantages, such as increased flexibility for students and teaching staff. In order to be able to use digital teaching methods and strategies profitably in veterinary education in the future, well thought-out didactic concepts and further technical expansion of the universities are required. In addition, the digital skills of teaching staff should be further trained and promoted.

Front. Vet. Sci., Volume 11 - 2024 | doi: 10.3389/fvets.2024.1385681

Identification of Parameters for Electronic Distance Examinations.

Robin Richter[1], Andrea Tipold[2], Elisabeth Schaper[1]

[1]Centre for E-Learning, Didactics and Educational Research (ZELDA), University of Veterinary Medicine Hannover, Foundation, Hanover, Germany

[2]Clinic for Small Animals, Neurology, University of Veterinary Medicine Hannover, Foundation, Hanover, Germany

Introduction: This study investigates the log data and response behavior from invigilated in-person electronic timed exams at the University of Veterinary Medicine Hannover, Foundation, Germany. The primary focus is on understanding how various factors influence the time needed per exam item, including item format, item difficulty, item discrimination and character count. The aim was to use these results to derive recommendations for designing timed online distance examinations, an examination format that has become increasingly important in recent years.

Methods: Data from 216,625 log entries of five electronic exams, taken by a total of 1,241 veterinary medicine students in 2021 and 2022, were analyzed. Various statistical methods were employed to assess the correlations between the recorded parameters.

Results: The analysis revealed that different item formats require varying amounts of time. For instance, image-based question formats and Kprim necessitated more than 60 s per item, whereas one-best-answer multiple-choice questions (MCQs) and individual Key Feature items were effectively completed in less than 60 s. Furthermore, there was a positive correlation between character count and response time, suggesting that longer items require more time. A negative correlation could be verified for the parameters “difficulty” and “discrimination index” towards response time, indicating that more challenging items and those that are less able to differentiate between high- and low-performing students take longer to answer.

Conclusion: The findings highlight the need for careful consideration of the ratio of item formats when defining time limits for exams. Regarding exam design, the literature mentions that time pressure is a critical factor, since it can negatively impact students’ exam performance and some students, such as those with disabilities, are particularly disadvantaged. Therefore, this study emphasizes finding the right time limits to provide sufficient time for answering questions and reducing

time pressure. In the context of unsupervised online exams, the findings of this study support previous recommendations that implementation of a stringent time limit might be a useful strategy to reduce cheating.

Front. Vet. Sci., Volume 11 - 2024 | https://doi.org/10.3389/fvets.2024.1292750

Knowledge attainment, learning approaches, and self-perceived study burnout among European veterinary students

Antti Iivanainen[1*†], Carlos Fernando Collares[2†], Jakob Wandall[3], Anna Anne Nevgi[6], Riikka Keto-Timonen[7], Andrea Tipold[8], Elisabeth Schaper[9], Theo van Haeften[10,11], Tina Holberg Pihl[12], Charles McLean Press[13], Peter Holm[4] for VetRepos consortium

[1]Department of Biosciences, Faculty of Veterinary Medicine, University of Helsinki, Helsinki, Finland
[2]Medical Education Unit, Faculty of Medicine and Biomedical Sciences, University of Algarve, Faro, Portugal
[3]NordicMetrics ApS, Copenhagen, Denmark
[4]Department of Veterinary and Animal Science, Faculty of Medical and Health Sciences, University of Copenhagen, Frederiksberg, Denmark
[5]Centre for University Teaching and Learning HYPE, Faculty of Educational Sciences, University of Helsinki, Helsinki, Finland
[6]Caledonia Hub (Campus Learning and Development Initiatives), Faculty of Educational Sciences, University of Helsinki, Helsinki, Finland
[7]Department of Food Hygiene and Environmental Health, Faculty of Veterinary Medicine, University of Helsinki, Helsinki, Finland
[8]Clinic for Small Animals, Neurology, University of Veterinary Medicine Hannover, Foundation, Hannover, Germany
[9]Centre for E-learning, Didactics and Educational Research, University of Veterinary Medicine Hannover, Foundation, Hannover, Germany
[10]Department of Biomolecular Health Sciences, Faculty of Veterinary Medicine, University of Utrecht, Utrecht, Netherlands
[11]Center for Academic Teaching and Learning, Utrecht University, Utrecht, Netherlands
[12]Department of Veterinary Clinical Sciences, Faculty of Health and Medical Sciences, University of Copenhagen, Taastrup, Denmark
[13]Department of Preclinical Sciences and Pathology, Faculty of Veterinary Medicine, Norwegian University of Life Sciences, Ås, Norway

Introduction: This study investigates the relationship between approaches to learning, self-perceived study burnout, and the level of knowledge among veterinary students. Veterinary educational programs are under regular development and would benefit greatly from detailed feedback on students' knowledge, proficiency, influencing factors, and coping mechanisms.

Methods: The VetRepos consortium developed and calibrated an item repository testing knowledge across the entire veterinary curriculum. Two hundred forty-eight students from seven European veterinary institutions took the VetRepos test, comprising a subset of the repository. They also responded to a questionnaire assessing deep and unreflective learning approaches and self-perceived study burnout, represented by exhaustion and cynicism. Structural equation modeling analyzed the relationship between these latent traits and the VetRepos test score.

Results: The model failed the exact-fit test but was retained based on global fit indices, inter-item residual correlations, and standardized residual covariances. Root Mean Square Error of Approximation with robust standard errors and scaled test statistic was 0.049 (95% confidence interval 0.033–0.071), scaled and robust Comparative Fit Index 0.95 (0.90–0.98), and scaled Standardized Root Mean Square Residual 0.056 (0.049–0.071). Measurement invariance across study years was not violated (ΔCFI = 0.00, $\chi 2$ = 3.78, Δdf = 4, p = 0.44), but it could not be confirmed between genders or universities. The VetRepos test score regressed on the study year [standardized regression coefficient = 0.68 (0.62–0.73)], showed a negative regression on the unreflective learning approach [−0.25 (−0.47 to −0.03)], and a positive regression on the deep approach [0.16 (0.03–0.28)]. No direct association with perceived burnout was observed; however, a significant, medium-sized association was found between the unreflective approach and self-perceived study burnout. No significant differences in learning approaches or perceived burnout were found between study years.

Discussion: The most important source of variance in VetRepos test scores, unrelated to the study year, was the learning approach. The association between the VetRepos test score and self-perceived burnout was indirect. Future research should complement this cross-sectional approach with longitudinal and person-oriented studies, further investigating the relationship between study burnout and learning approaches.

Front. Vet. Sci. 10:1062046. doi: 10.3389/fvets.2023.1062046

Veterinarians' perspective on telemedicine in Germany

Björn Becker[1,2], Andrea Tipold[3], Jan Ehlers[4], Christin Kleinsorgen[1]
[1]Centre for E-Learning, Didactics and Educational Research, University of Veterinary Medicine, Hannover, Germany
[2]Veterinary Practice B. Becker, Heek, Germany
[3]Clinic for Small Animals, University of Veterinary Medicine, Hannover, Germany
[4]Department of Medical, Faculty of Health, Didactics and Educational Research in Health Care, Witten/Herdecke University, Witten, Germany

Introduction: Information on the use of telemedical approaches in the context of veterinary medicine is evolving. As in human medicine, veterinary medicine is subject to an increasing digitalization effort. The aim of the current study was to investigate the perspective of German veterinarians regarding their awareness and usage of telemedical approaches. Furthermore, the degree of implementation of different digital approaches in the context of German veterinary medicine was elaborated.

Methods: A literature review, that also aimed to address the necessary framework or standardization of these digitalization efforts and potential barriers such as legal or infrastructural aspects, provided information for the empirical research. Using a quantitative research approach, the perspective of German veterinarians was surveyed.

Results: In total, responses from 169 veterinarians were analyzed. The results show that digital approaches were used by veterinarians and the usage was enhanced by the COVID-19 crisis.

Discussion: However, the lack of a clear legal framework may be a significant barrier for further implementation. This survey provides a basis for a critical discussion on the use of veterinary telemedicine in Germany. The results may contribute to future strategies for the implementation and development of necessary policies, training, and service applications within Germany, which may be transferable for the profession in other countries.

Keywords: telemedicine, veterinary telemedicine, teleconsultation, teleradiology, digitalization

Front Vet Sci. 10:1196311 doi: 10.3389/fvets.2023.1196311

Evaluation of the eOSCE for testing clinical skills

Svenja Berendes[1*], Elisabeth Schaper[2], Andrea Tipold[3], Sandra Wissing[1*]
[1]Centre for E-Learning, Didactics and Educational Research (ZELDA), Clinical Skills Lab, University of Veterinary Medicine Hannover, Foundation, Hannover, Germany
[2]Centre for E-Learning, Didactics and Educational Research (ZELDA), E-Learning Consulting, University of Veterinary Medicine Hannover, Foundation, Hannover, Germany
[3]Clinic for Small Animals, Neurology, University of Veterinary Medicine Hannover, Foundation, Hannover, Germany

The OSCE is a proven instrument for testing practical skills of students, not only in the (veterinary) medical field. At the University of Veterinary Medicine Hannover, Foundation (TiHo), students must complete a 10-week rotation in one of the university's own clinics during the practical year in the 9th and 10th semesters in addition to other practical training. Within this framework, the first training for acquiring clinical practical skills with a formative examination (OSCE; Objective Structured Clinical Examination) was developed in the Clinical Skills Lab (CSL) in 2014. Since 2018, the TiHo has been the first veterinary medical training institution in Germany to conduct electronic OSCEs (eOSCEs). In the future, eOSCEs will also be introduced as a summative examination at the TiHo. For this reason, students in the practical year of the winter semester 2021/2022 and summer semester 2022 as well as former and current examiners were surveyed regarding their satisfaction with the eOSCE examination format as part of this study. The 175 analyzed questionnaires from students and 27 analyzed questionnaires from examiners showed a high level of satisfaction with the eOSCE overall, but at the same time indicated problems that should be ironed out before it is introduced as a summative examination in the state examination. In addition to its standardization and objectivity, the examination format also convinced with its quality-assurance review procedure and the direct feedback possibility with regard to the students' performance.

Keywords: eOSCE, E-assessment, clinical skills, clinical assessment, veterinary education, formative test, questionnaire based study

Der Praktische Tierarzt 104 Heft 4/2023, Seiten 326-336. DOI 10.2376/0032-681X-2311

Applied examination techniques for the diagnosis of steroid-responsive meningitis arteritis in small and mixed animal practice

A. Cordes, C. Kleinsorgen, J. Neßler, T. Flegel, E. Hilpert, A. Tipold

In the context to foster further research on the etiology of steroid-responsive meningitis-arteritis (SRMA), it is of uttermost importance to evaluate dogs with a confirmed diagnosis. The aim of the current questionnaire-based study was to investigate whether typical clinical signs such as increased body temperature and pain are used to diagnose the disease, or whether SRMA is diagnosed by several laboratory parameters, such as cerebrospinal fluid analysis. The following hypothesis should be proven: "In general practice the diagnosis of SRMA is made if typical clinical signs are present and laboratory tests including blood and cerebrospinal fluid examinations support the diagnosis." Questionnaire based studies could support epidemiologic and genetic research to detect the etiology of the disease.

The data was collected using an online questionnaire and the LimeSurvey® program (LimeSurvey GmbH, Hamburg, D). The survey was distributed via facebook®, personal contact via e-mail to various veterinary practices and announcement in the newsletter of the Lower Saxony Chamber of Veterinarians. The questionnaire consisted of 7 general questions and a special part including 20 questions. The special part was available for repeated entries.

A total of 145 veterinarians took part in this study, and the answers of 90 participants could be evaluated. Further investigations, such as cerebrospinal fluid analysis, were rarely carried out in practice to diagnose SRMA and in the current study mostly dogs with presumed SRMA were included. This could explain the discrepancy to clinically confirmed cases displaying a different breed spectrum. Described dogs could have suffered from other diseases than SRMA summarized under the umbrella term "fever of unknown origin".

The current study shows that in practice, dogs with SRMA are often treated after a presumed diagnosis has been made. For epidemiological and genetic studies, a

confirmed diagnosis with the support of laboratory examinations is recommended and questionnaire based studies cannot support this research.

Keywords: steroid-responsive, meningitis-arteritis, CSF examination, IgA, general practices, survey

Equine Veterinary Journal. https://doi.org/10.1111/evj.14001

Digitalisation in pre-purchase examination and prospects for an equine health database in Germany — Results of an online survey among equine veterinarians

Muriel Sarah Folgmann, Christin Kleinsorgen, Kathrin Friederike Stock, Daniel Meister, Maren Hellige, Karsten Feige, Uta Delling

Background: Digital recording and storage of health data are becoming increasingly important in the fields of both human and veterinary medicine. There is currently a lack of information on the level of digitalisation among equine veterinarians in Germany and their attitudes towards advanced digitalisation.

Objectives: To collect opinions of equine veterinarians about (1) digital data collection in pre-purchase examinations (PPEs), and (2) the establishment of an equine health database in Germany.

Study design: Cross-sectional survey.

Methods: An online survey was developed and distributed via email exclusively to equine veterinarians in Germany. After 40 days of data collection, answers were used for descriptive statistical analyses.

Results: The survey was sent to 1055 recipients, of which 147 (13.9%) participated and 130 survey responses from equine veterinarians could be used for analyses. Most respondents were working in an equine practice (77.9%) and performing PPEs (93.8%), for which they mostly used printed protocols (86.0%). The PPE protocol of the German Equine Veterinary Association as a paper print was the format most frequently used (47.1%). The majority of participating equine veterinarians (90.2%) would use a digital protocol for PPEs if available. Concerns were expressed about user-friendliness (55.9%) and integration into the daily veterinary routine (54.6%). Regarding the establishment of an equine health database, 72.3% of the respondents stated they would appreciate it. However, about one-third would support such a development only under certain conditions: guaranteed data safety, collection of objective data or involving the opinion of other stakeholders.

Main limitations: Low response rate, potential non-response bias and wide range of question topics.

Conclusion: A positive attitude towards digital PPEs and an equine health database in Germany became apparent. To facilitate further progress, it would be crucial to

consider the concerns and conditions identified in this study to generate maximum compliance.

Front. Vet. Sci., Volume 10 - 2023 doi:10.3389/fvets.2023.1163927

Teaching clinical hematology and leukocyte differentiation in veterinary medicine using virtual patients

Hannah Marahrens[1*†], Matthias Gerhard Wagener[1†], Elisabeth Schaper[2], Jana Zintl[2], Frederik Kiene[1] and Martin Ganter[1]

[1]Clinic for Swine and Small Ruminants, Forensic Medicine and Ambulatory Service, University of Veterinary Medicine Hannover, Foundation, Hannover, Germany

[2]Center for E-Learning, Didactics and Educational Research, University of Veterinary Medicine Hannover, Foundation, Hannover, Germany

Due to contact restrictions imposed because of the COVID-19 pandemic, we created a novel digital course on the Moodle learning platform for winter term in 2020. In the clinical pathology course (CPC) with hematological content, third-year students were able to work independently on 10 extra digital cases of internal medicine involving eight different animal species as a compensation for the reduction in traditional microscopy exercises. Each case presented was initiated using an anamnesis, also the participants to generate a differential blood count based on digitized leukocytes, previously been photographed using a microscope camera. The cases were successive and increased in complexity, for example through the increase in the number of different cell types to be differentiated. The participants had the opportunity to evaluate the course through a final module to rate user-friendliness and acceptance. The total results of the participants in 2021 were analyzed descriptively, focusing on success rates, time spent on the tasks, and number of attempts. A total of 237 (= 96%) of 247 students completed all cases, each assessing 1033 photographed blood cells in sum. The mean processing time was 22.48min for a differentiation and the students spent an average of 1.48 attempts on it. A voluntary feedback form was completed by 192 (= 78%) students, with more than 95% rating the course positively in 12 evaluation questions, and 29 of 33 comments (= 87.88%) providing positive statements in a comment box. Suggestions for improvement primarily included more explanations on erythrocyte morphologies, followed by adjusting the difficulty level and improving the presentational set-up. Slight improvements in results, time spent on processing the tasks, and the number of attempts indicated an achievement of routine and confidence during the course and were associated with an increase of competency. The positive feedback showed a high acceptance of the digital format and students evaluated the course as improving the quality of teaching when combined with practical exercises.

Keywords: virtual patients, digital teaching, hematology, veterinary medicine, blood cell count, leukocyte differentiation

Berl Munch Tierarztl Wochenschr. 136:1-17. doi: 10.2376/1439-0299-2022-19

What are we keeping for the future? – Survey of students on veterinary studies during COVID-19

Hannah Naundorf[1], Andrea Tipold[2], Elisabeth Schaper[1]
[1]Centre for E-Learning, Didactics and Educational Research, University of Veterinary Medicine Hannover, Foundation, Hannover, Germany
[2]Clinic for Small Animals, University of Veterinary Medicine Hannover, Foundation, Hannover, Germany

This study evaluates the hybrid semesters (winter term 20/21 and summer term 21) conducted at the University of Veterinary Medicine Hannover during the Covid-19 pandemic from the students' perspective. The results will be used to adapt future veterinary teaching to the needs and wishes of the students, especially with regard to the teaching formats used in the future.

For this purpose, a survey was conducted among the students enrolled at the TiHo in the summer semester 2021. 492 fully completed questionnaires were included in the analysis. The main topics of the survey were technical requirements for studying, influences of the hybrid semesters on learning, impact of the hybrid semesters on the students' studies, and general study conditions.

The results of the study show a positive evaluation of the hybrid semesters. Students highlighted increased flexibility and lecture recording as main benefits of digital teaching. With the available hardware, the majority of students was able to take part in all courses of their studies. However, they indicated that digital teaching made social interaction more difficult. In order to maintain the advantages of digital teaching and compensate disadvantages, veterinary medicine studies should in future be conducted with suitable lectures as digital events or in a blended learning format and practical exercises as face-to-face events.

Keywords: digital education, hybrid, veterinary education, coronavirus

J Vet Med Educ. doi: 10.3138/jvme-2023-0061

Measures for Quality Assurance of Electronic Examinations in a Veterinary Medical Curriculum

Robin Richter[1], Andrea Tipold[2], Elisabeth Schaper[1]
[1]Centre for E-Learning, Didactics and Educational Research, University of Veterinary Medicine Hannover, Bünteweg 2, 30559 Hannover, Germany
[2]Department of Small Animal Medicine and Surgery, University of Veterinary Medicine Hannover, Bünteweg 9, 30559 Hannover, Germany

Since 2008, electronic examinations have been conducted at the University of Veterinary Medicine Hannover, Germany which are analyzed extensively in the current study. The aim is to assess the quality of examinations, the status quo of the electronic examination system and the implementation of recommendations regarding the conduct of exams at the TiHo. Based on the results suitable indicators for the evaluation of examinations and items as well as adequate quality assurance measures and item formats are to be identified. For this purpose, 294 electronic examinations carried out from 2008 to 2022 of the veterinary medicine course with an average of 248 participants each were evaluated with regard to the quality criteria reliability, difficulty index, and discrimination index. The main finding was that the number of items and the proportion of reused questions were identified as factors through which the quality of the examinations can be increased with simple adjustments. A higher number of items led to better reliability, whereby the required minimum reliability in examinations of 0.8 was reliably achieved from an item number of 98 questions. The proportion of reused questions should be kept low, as these had a negative influence on the characteristic values. Measures accompanying examinations, such as training of question authors and a pre- and post-review process, should also ensure the quality of examinations. For the post-review process, the distribution of examination results, reliability, item and distractor analysis are adequate indicators for evaluating examinations.

Key words: e-assessment, veterinary education, examinations, item formats, Cronbach's a, discrimination index, multiple choice questions (MCQ)

Front. Vet. Sci. 10:1296514. doi: 10.3389/fvets.2023.1296514

Development of a shared item repository for progress testing in veterinary education

Elisabeth Schaper[1†], Theo van Haeften[2†], Jakob Wandall[3,4], Antti Iivanainen[5], Johanna Penell[6], Charles McLean Press[7], Pierre Lekeux[8] and Peter Holm[4†]
[1]Centre for E-learning, Didactics and Educational Research, University of Veterinary Medicine Hannover, Foundation, Hannover, Germany
[2]Department of Biomolecular Health Sciences, Faculty of Veterinary Medicine & Centre for Academic Teaching and Learning, Utrecht University, Utrecht, Netherlands
[3]NordicMetrics Aps, Copenhagen, Denmark
[4]Department of Veterinary and Animal Sciences, Faculty of Health and Medical Sciences, University of Copenhagen, Frederiksberg, Denmark
[5]Department of Veterinary Biosciences, Faculty of Veterinary Medicine, University of Helsinki, Helsinki, Finland
[6]Department of Clinical Sciences, Faculty of Veterinary Medicine and Animal Science, Swedish University of Agricultural Sciences, Uppsala, Sweden
[7]Department of Preclinical Sciences and Pathology, Faculty of Veterinary Medicine, Norwegian University of Life Sciences, Aas, Norway
[8]European Association of Establishments for Veterinary Education (EAEVE), Vienna, Austria

Introduction: Progress testing in education is an assessment principle for the measurement of students' progress over time, e.g., from start to graduation. Progress testing offers valid longitudinal formative measurement of the growth in the cognitive skills of the individual students within the subjects of the test as well as a tool for educators to monitor potential educational gaps and mismatches within the curriculum in relation to the basic veterinary learning outcomes.

Methods: Six veterinary educational establishments in Denmark, Finland, Germany (Hannover), the Netherlands, Norway, and Sweden established in cooperation with the European Association of Establishments for Veterinary Education (EAEVE) a common veterinary item repository that can be used for progress testing in European Veterinary Education Establishments (VEEs), linear as well as computer adaptive, covering the EAEVE veterinary subjects and theoretical "Day One Competencies." First, a blueprint was created, suitable item formats were identified, and a quality assurance process for reviewing and approving items was established. The items were trialed to create a database of validated and calibrated items, and the responses were subsequently psychometrically analyzed according to Modern Test Theory.

Results: In total, 1,836 items were submitted of which 1,342 were approved by the reviewers for trial testing. 1,119 students from all study years and all partners VEEs participated in one or more of six item trials, and 1,948 responses were collected. Responses were analyzed using Rasch Modeling (analysis of item-fit, differential item function, item-response characteristics). A total of 821 calibrated items of various

difficulty levels matching the veterinary students' abilities and covering the veterinary knowledge domains have been banked.
Discussion: The item bank is now ready to be used for formative progress testing in European veterinary education. This paper presents and discusses possible pitfalls, problems, and solutions when establishing an international veterinary progress test.

Keywords: Progress testing, European veterinary education, veterinary item repository, quality assurance, item writing, day one competencies, adaptive testing, linear testing

Adv in Health Sci Educ (2023). https://doi.org/10.1007/s10459-023-10295-y

Development and validation of the Workplace Learning Inventory in Health Sciences Education: a multimethod study

Evelyn Steinberg[1], Stephan Marsch[1], Takuya Yanagida1, Laura Dörrenbächer-Ulrich[2], Christopher Pfeiffer[1], Petra Bührle[1], Lukas Schwarz[3], Ulrike Auer[4], Christin Kleinsorgen[5], Franziska Perels[2]

[1]Vice-Rectorate for Study Affairs and Clinical Veterinary Medicine, University of Veterinary Medicine Vienna, Vienna, Austria
[2]Department of Educational Science, Saarland University, Saarbrücken, Germany
[3]Clinic for Swine, University of Veterinary Medicine Vienna, Vienna, Austria
[4]University Hospital for Small Animals, University of Veterinary Medicine Vienna, Vienna, Austria
[5]Centre for E-Learning, Didactics and Educational Research, University of Veterinary Medicine, Hannover, Germany

Health sciences students face many challenges in regard to clinical practical learning. A better understanding of student learning is required to address student needs in this crucial phase. The theory of self-regulated learning provides a comprehensive view of learning and could serve as a basis for further research. There are instruments to assess self-reg- ulated learning in preclinical academic learning. However, there are no such instruments for workplace learning. The aim of the present study is to provide a comprehensive inven- tory from which researchers can select those scales that are relevant to their research ques- tions in the investigation of workplace learning. Hence, the aim is to develop and validate a set of scales to assess undergraduates' workplace learning in health sciences education in four areas (cognition, motivation, emotion, and context) on two levels (the learning pro- cess level and the metalevel). Study 1 is a qualitative multimethod study to identify indica- tors and develop items. It integrates the perspectives of students, teachers, and researchers and includes six steps: literature review, interviews, synthesis, item development, expert review, and cognitive pretesting. This study yields a set of scales for each area on both lev- els. Study 2 is a quantitative study to assess the psychometric properties. The results show acceptable values in terms of unidimensionality, reliability and validity for each of the 31 scales. The newly developed Workplace Learning Inventory is comprehensive; the scales are relevant to workplace learning and short enough that their administration is feasible in the workplace setting. The rigorous process of questionnaire development contributes to the validity of scales. By providing the Workplace Learning Inventory, we hope to

encour- age research on workplace learning in health sciences education from an educational psy- chology perspective.

Keywords: Academic emotion, Academic motivation, Health sciences education, Learning environment, Learning strategies, Self-regulated learning, Questionnaire, Workplace learning

Berl Munch Tierarztl Wochenschr. 136: 1-16 doi: 10.2376/1439-0299-2022-18

The study entry phase of Veterinary Medicine – Challenges, Opportunities and Needs

J. Zintl, C. Kleinsorgen, A. Tipold, E. Schaper

This study surveyed students who started their studies at the University of Veterinary Medicine Hannover, Foundation (TiHo) in the Winter term 2021/22. They were surveyed both prospectively regarding their expectations, and retrospectively regarding their experiences during the study entry phase. For this purpose students received comparable questionnaires at the beginning of their first and second semesters concerning their individual prerequisites as well as their assessment of course goals and requirements, of classes taken in the first semester and of the study entry phase in general. Fifty paired samples were generated for the analysis.

The results illustrate that personal challenges pose the greatest difficulties for students of veterinary medicine. The most relevant stressors are learning-related difficulties and the pressure to perform in higher education. Those are intensified by the particularly extensive curriculum, as compared to other disciplines. Further noteworthy stressors include in the first year seemingly irrelevant basic subjects and a shortage of obligatory clinical-practical content as well as social challenges faced by the evaluated cohort during the COVID-19 pandemic. A rapid shift away from career aspirations in veterinary practice can also be noted between the first and second questionnaire.

On the other hand, first-year students of veterinary medicine already display an outstanding commitment to goals as well as identification with their field of study and the profession. For this reason, the demanding study entry phase is mostly overcome successfully.

Providing support with different electives for requirements of the vulnerable study entry phase that have been recognised as problematic should increase the likelihood of a smooth transition to life and learning at university as well as the veterinary profession.

Keywords: study requirements,ability to study,self-regulation, curriculum, learning

Animals 2023, 13, 3822. doi.org/10.3390/ani13243822

Simulator-Assisted Training of Abomasal Surgery—A Pilot Study Using Blended Learning and Face-to-Face Teaching

Julia Muehlberg[1], Andrea Tipold[2], Maike Heppelmann[3], Sandra Wissing[1]

[1]Clinical Skills Lab, Centre for E-Learning, Didactics and Training Research, University of Veterinary Medicine Hannover, 30173 Hannover, Germany
[2]Clinic for Small Animals, Neurology, University of Veterinary Medicine Hannover, 30559 Hannover, Germany
[3]Clinic for Cattle, University of Veterinary Medicine Hannover, 30173 Hannover, Germany

Two stimulators were developed, one simplified and one realistic, in the present study for learning abomasal surgery for veterinary students. The simulators were tested in a pilot study: The upcoming blended learning format was compared with traditional face-to-face teaching. A total of 21 5th-year students participated in the study. While one group learned the surgical technique in traditional face-to-face simulator training, the second group completed interactive video training asynchronously. Afterwards, skills were examined in person. The results showed that the different groups did not lead to different performance results. Participation in the study increased self-assessment of skills by an average of about 7 of 36 points, as well as the learning success and motivation of students in both groups. The simulators developed were well liked by the students and rated as appropriate by 12 practicing bovine veterinarians. The pilot study indicates that blended learning could be a suitable alternative to traditional face-to-face teaching. This should be followed by further research to support the use of blended learning in the veterinary education of clinical skills.

Keywords: veterinary education, clinical skills, blended learning, simulation, self-efficacy, abomasal displacement

Berl Münch Tierärztl Wochenschr (135), 1-16 . DOI: 10.2376/1439-0299-2021-13, 1-16 (2022)

Survey on the relevance of subjects in the current and future veterinary curriculum among veterinarians and veterinary students in Germany

V. Losansky, S. Arnhold, J. Aschenbach, T. Göbel, K. Fey, C. Kleinsorgen, C. Mülling, E. Schaper, J. Seeger, A. Tipold, M. Doherr

In Germany, veterinary education is regulated by the Licensing Regulation for Veterinarians (TAppV). The relevance of various subjects and competencies such as communication and business administration are controversially discussed. Main objectives were to assess (i) self-perceived importance of the study content during education, (ii) subjective relevance for the professional practice, and (iii) expected relevance for the TAppV subjects for a future-oriented education. Surveys were conducted by veterinarians and veterinary students on a 6-point Likert scale in order to identify fields of action for study redesign. In the first survey, 1851 veterinarians participated; 1084 fully answered questionnaires were evaluated. In the second survey, 875 veterinary students in semesters 7 to 11 participated; 610 questionnaires were complete. Three comparison groups were formed: (1) veterinarians who had studied before 2006 (2) veterinarians that studied according to the TAppV (enrolment between 2006 and 2012), and (3) veterinary students in their 7th–11th semester in winter 2019. Physics, zoology and botany were considered not relevant by all target groups. In contrast, anatomy, physiology, biochemistry and the practical-clinical subjects were seen as very relevant to extremely relevant. The relevance of sub-specialties for the veterinary profession as well as for a future curriculum was in the relevant to extremely relevant range. According to the survey participants, practical skills were not sufficiently taught in the clinical area. The results show that the relevance of some taught subjects for the veterinary profession is negated by veterinarians and students. Valuable information can be derived from the results regarding a future-oriented veterinary curriculum.

Keywords: curriculum reform, veterinary curriculum, Education, subjects, questionnaire

J Vet Med Educ e20210055. DOI: 10.3138/jvme-2021-0055

Use of Actors or Peers as Simulated Clients in Veterinary Communication Training

Michèle Rauch[1], Vivien Bettermann[2], Andrea Tipold[3], Sandra Wissing[2], Christin Kleinsorgen[1]

[1]Centre for E-Learning, Didactics and Educational Research, Foundation of the University of Veterinary Medicine Hannover, Hannover, Germany
[2]Clinical Skills Lab, Centre for E-Learning, Didactics and Educational Research, University of Veterinary Medicine Hannover, Hannover, Germany
[3]Clinic for Small Animals and Centre for E-Learning, Didactics and Educational Research, University of Veterinary Medicine Hannover, Hannover, Germany

Using simulated clients is an effective teaching method for training and assessing communication skills in veterinary education. The aim of this study is to evaluate the use of actors and peers in communication skills training in veterinary medicine. For this purpose, the subjective perception of the use of actors was assessed in a first study using a paper-based self-evaluation survey. In a second study, different groups of veterinary students who trained their communication skills with actors or peers were compared in an electronic Objective Structured Clinical Examination (eOSCE) assessment with regard to their outcomes of communication proficiency. All participants reported the actors to be helpful and supportive in learning communication skills. Above all, participants highly rated the achieved authenticity when using actors as well as feedback sessions. Regarding the comparison of actors and peers as teaching methods, no significant difference in the performance of veterinary students in an eOSCE was identified. Despite the lack of objective evidence, both methods may be considered valuable and accepted teaching tools. Training with peers gives students an opportunity to learn how to conduct structured history interviews and to understand pet owners' motives at an early stage of undergraduate veterinary training. Change of perspective is considered a positive training element. However, when portraying authentic and standardized emotions and reactions and giving formative feedback based on the pet owners' internal perspectives, actors are beneficial for training advanced veterinary students and graduates in difficult conversation topics.

Keywords: simulated clients, actors, communication training, peers, veterinary medicine students, veterinary medicine graduates

Front Vet Sci. 2022. Doi: 10.3389/fvets.2022.911026

Key feature-cases as virtual patients in education of veterinary neurology

Solveig Brigitta Reeh[1], Christin Kleinsorgen[2], Elisabeth Schaper[2], Holger Andreas Volk[1] and Andrea Tipold[1]
[1]Department of Small Animal Medicine and Surgery, University of Veterinary Medicine, Hannover, Germany
[2]Center for E-Learning, Didactics and Educational Research, University of Veterinary Medicine, Hannover, Germany

To provide students of veterinary medicine with the necessary day 1 competences, e-learning offerings are increasingly used in addition to classical teaching formats such as lectures. For example, virtual patients offer the possibility of case-based, computer-assisted learning. A concept to teach and test clinical decision-making is the key feature (KF) approach. KF questions consist of three to five critical points that are crucial for the case resolution. In the current study usage, learning success, usability and acceptance of KF cases as neurological virtual patients should be determined in comparison to the long cases format. Elective courses were offered in winter term 2019/20 and summer term 2020 and a total of 38 virtual patients with neurological diseases were presented in the KF format. Eight cases were provided with a new clinical decision-making application (Clinical Reasoning Tool) and contrasted with eight other cases without the tool. In addition to the evaluation of the learning analytics (e.g., processing times, success rates), an evaluation took place after course completion. After 229 course participations (168 individual students and additional 61 with repeated participation), 199 evaluation sheets were completed. The average processing time of a long case was 53 min, while that of a KF case 17 min. 78% of the long cases and 73% of KF cases were successfully completed. The average processing time of cases with Clinical Reasoning Tool was 19min. The success rate was 58.3 vs. 60.3% for cases without the tool. In the survey, the long cases received a ranking (1 = very good, 6 = poor) of 2.4, while KF cases received a grade of 1.6, 134 of the respondents confirmed that the casework made them feel better prepared to secure a diagnosis in a real patient. Flexibility in learning (n = 93) and practical relevance (n = 65) were the most frequently listed positive aspects. Since KF cases are short and highlight only the most important features of a patient, 30% (n = 70) of respondents expressed the desire for more specialist information. KF cases are suitable for presenting a wide range of diseases and for training students' clinical

decision-making skills. The Clinical Reasoning Tool can be used for better structuring and visualizing the reasoning process.

Keywords: Key feature cases, virtual patients, Clinical Reasoning, veterinary neurology, clinical decision-making

GMS J Med Educ, 39(5), (2022). DOI: 10.3205/zma001580

Publication activities relating to digital teaching and learning in the GMS Journal for Medical Education – a descriptive analysis (1984–2020)

Christin Kleinsorgen[1], Andrea Baumann[2], Barbara Braun[3], Jan Griewatz[2], Johannes Lang[4], Holger Lenz[5], Johanna Mink[6], Tobias Raupach[7], Bernd Romeike[8], Thomas Christian Sauter[9], Achim Schneider[10], Daniel Tolks[11], Inga Hege[12]

[1]University of Veterinary Medicine Hannover, Foundation, Centre for E-Learning, Didactics and Educational Research (ZELDA), Hannover, Germany
[2]University of Tübingen, Faculty of Medicine, The Competence Center for University Teaching in Medicine Baden-Württemberg, Faculty, Tübingen, Germany
[3]Medical Faculty Mannheim of the University of Heidelberg, Studies and teaching development, digital teaching, Mannheim, Germany
[4]Justus-Liebig University Gießen, Faculty of Medicine, Division for Study and Teaching, Gießen, Germany
[5]LMU Munich, University Hospital, Institute for Medical Education, Munich, Germany
[6]University Hospital Heidelberg, Department of General Medicine and Health Services Research, Heidelberg, Germany
[7]University Hospital Bonn, Institute for Medical Education, Bonn, Germany
[8]University Medical Center, Academic Dean's Office, Division of Medical Education, Rostock, Germany
[9]University Hospital Bern, Inselspital, Department of Emergency Medicine, Bern, Switzerland
[10]Ulm University, Medical Faculty, Office of the Dean of Studies, Ulm, Germany
[11]Leuphana University Lüneburg, Centre for Applied Health Promotion, Lüneburg, Germany; Bielefeld University, Faculty of Medicine, WG Digital Medicine, Bielefeld, Germany
[12]LMU Munich, University Hospital, Institute for Medical Education, Munich, Germany; University of Augsburg, Medical Education Sciences, Augsburg, Germany

Aims and objectives: Digital teaching, learning and assessment have been part of medical education and continuing education for decades. The objective of this review paper is to highlight developments and perspectives in these areas in the GMS Journal for Medical Education (GMS JME).

Methodology: In the spring of 2020, we conducted a systematic literature search of the Journal for Medical Education (JME) and analysed the articles with regard to different categories such as article type, digital tools used or mode of data collection.

Results: Of the 132 articles analysed, 78 were digital interventions (53 of which were exploratory-descriptive), 28 were project descriptions, 16 were surveys of needs or equipment and 10 were concept papers. About one-third of the studies and project reports each dealt with virtual patients or case-based learning, whereas no articles were published on trends such as serious games or virtual reality. Overall, our analysis shows that in many respects, the studies on digital teaching were more broadly based, especially between 2006 and 2010, after which this trend tended to decline again.

Conclusions: Our analysis shows that publications in the JME consider some key aspects of digital teaching in medical education and continuing education, such as educational videos or virtual patients. The variability of information and methods of

presentation advocate the use of guidelines to optimise the quality of scientific papers. Furthermore, clues for future research topics and experimental study designs are identified.

Keywords: literature review, digital teaching, e-learning, digital learning, digital assessment, GMS Journal for Medical Education

GMS J Med Educ 2021; 38(5):Doc86 (20210615)

Teaching clinical practical and communication skills of the clinical skills lab of the University of Veterinary Medicine Hannover, Foundation, Germany during the COVID-19 pandemic

Silja Brombacher-Steiert[1], Raphaela Ehrich[1], Claudia Schneider[1], Lina R. Müller[2], Andrea Tipold[3], Sandra Wissing[1]

[1]University of Veterinary Medicine Hannover, Foundation, Centre for E-Learning, Didactics and Training Research, Clinical Skills Lab, Hannover, Germany

[2]University of Veterinary Medicine Hannover, Foundation, Centre for E-Learning, Didactics and Training Research, E-Learning Consulting, Hannover, Germany

[3]University of Veterinary Medicine Hannover, Foundation, Clinic for Small Animals, Hannover, Germany

Objective: The aim of the project is to teach clinical practical and communication skills in the Clinical Skills Lab (CSL) of the University of Veterinary Medicine Hannover, Foundation (TiHo) during the COVID-19 pandemic.

Methodology: As a measure to limit potential SARS-CoV2 infections, the CSL learning stations were digitised and made available on the Moodle learning platform of the TiHo. Online quiz stations were also developed, as well as improvisations that allowed students to practise practical skills at home using everyday materials. Courses for Practical Year (PY) students were digitised and again combined with classroom exercises throughout the year. The teaching formats could be evaluated by the students by means of a questionnaire using a Likert scale (1=agree; 4=disagree).

Results: A total of 24.92% of students (n=1272) completed the learning stations with improvisations. The quiz stations were completed with a percentage of 75.08%. Students indicated that the improvisations were easily implementable from home (M=1.33) and assisted in learning the practical skills in question (M=1.89). The quiz stations were considered helpful (M=1.40) and complementary to previous CSL offers (M=1.13). The PY students found the amount of teaching materials adequate (M=1.76) and described communication with the lecturers as problem-free (compulsory electives=1.24).

Conclusions: Digital teaching is suitable as a supplement to existing face-to-face courses at the CSL, but cannot replace on-site training under the guidance of trained personnel. The CSL will continue to strive for a combination of online and face-to-face courses for some learning stations in the future.

Keywords: veterinary medicine, digital teaching, moodle, online teaching format, practical skills, blended learning.

GMS Journal for Medical Education, 38 (4). https://doi.org/10.3205/zma001480

Communication as teaching content of veterinary studies – a joint position paper from the DVG specialist group "communication and didactics" and the GMA veterinary medicine committee

Christian Gruber[1], Marc Dilly[2], Mahtab Bahramsoltani[3], Christin Kleinsorgen[4], Simon Engelskirchen[5], Sabine Ramspott[6], Jan P. Ehlers[7]

[1]veted-consulting by Christian Gruber, Munich, Germany
[2]scil vet academy, Viernheim. Germany; Justus-Liebig-University Giessen, Faculty of Veterinary Medicine, Giessen, Germany
[3]Freie Universitaet Berlin, Institute of Veterinary Anatomy, Berlin, Germany
[4]University of Veterinary Medicine Hannover, Center for E-Learning, Didactics and Educational Research, Hannover, Germany
[5]AniCura Duisburg-Asterlagen GmbH, Duisburg, Germany
[6]Trillium GmbH Medizinischer Fachverlag, Grafrath, Germany
[7]University of Witten/Herdecke, Faculty of Health, Chair of Didactics and Educational Research in Health Care, Witten, Germany

Veterinarians have to face many communicative challenges in their professional capacity. Successful professional communication increases satisfaction among pet owners, staff members and colleagues, and ultimately also the veterinarians' own satisfaction. On the other hand, unsuccessful communication can easily lead to rejection, distrust and dissatisfaction.

However, communicative skills are not explicitly taught as part of the compulsory courses in veterinary medicine in Germany.

The position paper of the GMA Veterinary Medicine Committee and the DVG work group Didactics and Communication Competence describes the importance of successful communication for working veterinarians as well as the training situation in Germany and addresses topics that are often discussed in connection with the implementation.

The authors come to the conclusion that there is both a necessity and a possibility for the introduction of communicative training content and provide recommendations that are intended to support the sustainable introduction of courses and exams to develop the communicative skills of veterinary students.

Keywords: communication, veterinary medicine, communication competence

BMTW 2021; 134. https://doi.org/10.2376/1439-0299-2021-11

Results of the Progress Test Veterinary Medicine at the University of Veterinary Medicine Hannover, Foundation

L. Herrmann, F. Freise, A. Tipold, E. Schaper

In the current study the German progress test at the University of Veterinary Medicine Hannover was analyzed for the first time. The “progress test veterinary medicine” (PTT) is a longitudinal measurement instrument that captures the level and growth of expertise during veterinary studies.

In this study, 2.975 records of PTT scores from 2013 to 2019 were analyzed. The study-results will be used for curriculum evaluation at the University of Veterinary Medicine Hannover (TiHo) and should evaluate whether the PTT is an appropriate measurement tool for the increasing knowledge of TiHo-students.

The PTT contains 136 multiple choice questions from 34 subjects of the veterinary medicine curriculum in a standardized composition and is offered online as a formative feedback instrument for students of all semesters.

A key finding of the current study is that the PTT indicates continuous knowledge progress across all years of study and in all subjects. The proportion of correct answers (R) increases steadily and the “I don’t know” answers decrease with progress in the course. This phenomenon, the fact that students generally do not prepare for the progress tests and that spontaneously retrievable knowledge is tested, have an impact on a student’s overall test score R-F (difference between questions answered correctly and incorrectly): the eleventh semester reaches an average of 24.79%.

The study was able to show that knowledge is anchored in students over the tested period and continues to be present consistently throughout the course of study. The PTT is a suitable instrument for curriculum evaluation and supports the feedback culture and students in assessing their strengths and weaknesses.

Keywords: formative, longitudinal, assessment, retrievable knowledge, linear test

GMS J Med Educ 2021;38(3):Doc50; doi: 10.3205/zma001446;

"The SOFTVETS Competence Model" – a preliminary project report

Christin Kleinsorgen[1], Evelyn Steinberg[2], Rudolf Dömötör[3], Jelka Zabavnik Piano[4], Jože Rugelj[5], Mira Mandoki[6], Lada Radin[7]

[1]University of Veterinary Medicine Hannover, Foundation, ZELDA - Centre for E-Learning, Didactics and Educational Research, E-Learning-Department, Hannover, Germany
[2]University of Veterinary Medicine Vienna, Office of the Vice-Rectorate for Study Affairs, Vienna, Austria
[3]Vienna University of Economics and Business, Vienna, Austria
[4]University of Ljubljana, Veterinary Faculty, Ljubljana, Slovenia
[5]University of Ljubljana, Faculty of Education, Ljubljana, Slovenia
[6]University of Veterinary Medicine Budapest, Budapest, Hungary
[7]University of Zagreb, Faculty of Veterinary Medicine, Zagreb, Croatia

Aim: Recent developments measured using statistics and surveys among veterinarians show that integrating key competence training into veterinary education is becoming increasingly important.

This article describes the collaborative development process of the first work package within the SOFTVETS project. The SOFTVETS project aims to create a competence model and an ideal version of a soft skills curriculum that can be implemented in veterinary higher education throughout Europe.

Method: In the course of a desk research phase, a literature review and an inventory of the current practice of key competence training within veterinary education was carried out. An initial set of recommendations for three competence areas was developed using the Handbook for Internal Quality Management in Competence-Based Higher Education. Finally, an alternating sequence of individual and collaborative expert reviews was carried out.

Result: Experts from five European countries participated in the process. The derived competence model consisted of the following three competence areas with the corresponding number of defined competences: ten communication, nine entrepreneurial and eight digital competences.

Conclusion: In the next work packages, learning objectives, teaching and assessment methods will be collected. Training concepts for facilitators to provide professional competence training will be established. In addition, an evaluation toolkit will be developed to standardise the implementation, evaluation and assessment of competence training events.

The SOFTVETS competence model should help educators to be able to integrate the training of key competence training into the veterinary curriculum. This detailed list

of competences can also be used as a tool to identify existing deficiencies and thus enable further curricular changes.

Keywords: veterinary medicine education, communication, entrepreneurship, digital competences

ACS Infectious Diseases, 7 (8), 2205-2208.
https://doi.org/10.1021/acsinfecdis.1c00210

Antimicrobial Susceptibility Testing of Antimicrobial Peptides Requires New and Standardized Testing Structures

Marita Meurer, Deborah A. O'Neil, Emma Lovie, Laura Simpson, Marcelo D. T. Torres, Cesar de la Fuente-Nunez, Alfredo M. Angeles-Boza, Christin Kleinsorgen, Derry K. Mercer, Maren von Köckritz-Blickwede

The need for optimized as well as standardized test systems of novel antimicrobial peptides (AMPs) was discussed by experts in the field at the International Meeting on Antimicrobial Peptides (IMAP) 2017 and the 2019 Gordon Research Conference (GRC) on Antimicrobial Peptides, and a survey related to this topic was circulated to participants to collate opinions. The survey included questions ranging from the relevance of susceptibility testing for understanding the mode of action of AMPs, to the importance of optimization and a degree of standardization of test methods and their clinical relevance. Based on the survey results, suggestions for future improvements in the research field are made.

Keywords: Chemical structure, Immunology, Ions, Peptides and proteins, Testing and assessment

Front Vet Sci. 2021;8. doi:10.3389/fvets.2021.753903

Proof of Concept: Game-Based Mobile Learning—The First Experience With the App Actionbound as Case-Based Geocaching in Education of Veterinary Neurology

Jasmin Nessler[1], Elisabeth Schaper[2], Andrea Tipold[1]
[1]Department of Small Animal Medicine and Surgery, University of Veterinary Medicine Hannover, Foundation, Hannover, Germany
[2]Centre for E-Learning, Didactics and Educational Research (ZELDA), University of Veterinary Medicine Hannover, Foundation, Hannover, Germany

Case-based learning is a valuable tool to impart various problem-solving skills in veterinary education and stimulate active learning. Students can solve imaginary cases without the need for contact with real patients. Case-based teaching can be well performed as asynchronous remote-online class. In time of the COVID-19-pandemic, many courses in veterinary education are provided online. Therefore, students report certain fatigue when it comes to desk-based online learning. The app "Actionbound" provides a platform to design digitally interactive scavenger hunts based on global positioning system (GPS)—called "bounds" —in which the teacher can create a case study with an authentic patient via narrative elements. This app was designed for multimedia-guided museum or city tours initially. The app offers the opportunity to send the students to different geographic localizations for example in a park or locations on the University campus, like geocaching. In this way, students can walk outdoors while solving the case study. The present article describes the first experience with Actionbound as a tool for mobile game-based and case-orientated learning in veterinary education. Three veterinary neurology cases were designed as bounds for undergraduate students. In the summer term 2020, 42 students from the second to the fourth year of the University of Veterinary Medicine Hannover worked on these three cases, which were solved 88 times in total: Cases 1 and 2 were each played 30 times, and case 3 was played 28 times. Forty-seven bounds were solved from students walking through the forest with GPS, and 41 were managed indoors. After each bound, students evaluated the app and the course via a 6-point numerical Likert rating scale (1 = excellent to 6 = unsatisfactory). Students playing the bounds outdoors performed significantly better than students solving the corresponding bound at home in two of the three cases ($p = 0.01$). The large majority of the students rated the course as excellent to good (median 1.35, range 1–4) and would recommend the course to friends (median 1.26, range 1–3). Summarizing, in teaching

veterinary neurology Actionbound's game-based character in the context of outdoor activity motivates students, might improve learning, and is highly suitable for case-based learning.

Keywords: bounds, gamification, active learning, teaching, scavenger hunt

GMS J Med Educ 2021;38(3):Doc53; doi: 10.3205/zma001449

Integration and potential of teaching communication skills in the study of veterinary medicine in Germany

Alina Pohl[1], Luise Grace[1], Christin Kleinsorgen[2], Dora Bernigau[3], Birte Pfeiffer-Morhenn[4], Stefan Arnhold[4], Marc Dilly[5], Christina Beitz-Radzio[6], Sandra Wissing[2], Lena Vogt[1], Mahtab Bahramsoltani[1]

[1]Freie Universität Berlin, Department of Veterinary Medicine, Berlin, Germany
[2]University of Veterinary Medicine Hannover, Foundation, Hannover, Germany
[3]Leipzig University, Faculty of Veterinary Medicine, Leipzig, Germany
[4]Justus-Liebig-University Giessen, Faculty of Veterinary Medicine, Giessen, Germany
[5]Justus-Liebig-University Giessen, Faculty of Veterinary Medicine, Giessen, Germany; scil vet acadamy, Viernheim, Germany
[6]Ludwig-Maximilians-Universität Munich, Faculty of Veterinary Medicine, Munich, Germany

Goal: Presentation of the current range of courses regarding communication at the five German educational institutions for veterinary medicine. In addition to learning objectives and individual solutions, possible potential for future developments are presented.

Methods: Interviews with communication educators at the five German education institutions and subsequent synopsis.

Results: To date, there are no binding education guidelines regarding communication in veterinary medicine. Nevertheless, communication education has been introduced at all five education institutions, albeit depth and formats vary considerably. The learning objectives are largely consistent and based on the recommendations for day-one-skills made by the European Association of Establishments for Veterinary Education. Communication is not recognized as a fully-fledged subject in the curricula of any of the education institutions. All education institutions clearly fall short of teaching the recommended 150 lecture hours.

Conclusion: To ensure communication skills in veterinary medicine graduates, binding education guidelines should be agreed upon. Communication education should be integrated into all veterinary curricula as a fully-fledged subject with longitudinally increasing depth.

Keywords: veterinary medical education, communication skills, soft skills, curriculum development

BMC Med Educ 21, 516 (2021). https://doi.org/10.1186/s12909-021-02938-8

Interprofessional survey on communication skills in veterinary and veterinary-related education in Germany

Michèle Rauch[1], Sandra Wissing[1], Andrea Tipold[2], Christin Kleinsorgen[3]
[1]Centre for E-Learning, Didactics and Educational Research (ZELDA), Clinical Skills Lab, University of Veterinary Medicine Hannover, Foundation, Bischofsholer Damm 15, 30171 Hannover, Germany
[2]Small Animal Clinic, University of Veterinary Medicine Hannover, Foundation, Bünteweg 9, 30559, Hannover, Germany
[3]Centre for E-Learning, Didactics and Educational Research (ZELDA), E-Learning-Department, University of Veterinary Medicine Hannover, Foundation, Bünteweg 2, 30559 Hannover, Germany

Background: Communication is an indispensable skill in the everyday working life of a veterinary team. In German higher educational institutions, communication skills training is explicitly mentioned in the curricula of veterinary assistants, including veterinary nurses and veterinary technicians, and of animal keepers, but not for undergraduate veterinary medicine. Little is known about interprofessional education in veterinary medicine and related professions. Therefore, the purpose of this study is to describe and explore the current interprofessional state of knowledge regarding communication skills of the aforementioned groups in Germany.

Methods: To explore the perception, assess the knowledge and identify the attitude regarding communication skills and interprofessional training, an online survey was distributed. The survey was sent to all five veterinary higher educational institutions, 38 schools for veterinary assistants and 15 schools for animal keepers throughout Germany.

Results: In total, 294 veterinary students, 111 veterinary assistant trainees and 62 animal keeper trainees participated. The majority of participants (98.07%, n = 458) perceived communication skills as highly important for their everyday work. In total, 413 participants (88.44%) felt that their communication skills needed improvement and more than half admitted having difficulties in effective communication (59.31%; n = 277). In addition, 62.74% of respondents (n = 293) were not sufficiently informed about the training content of their future colleagues. Most were convinced that training could positively influence on their communication with clients (95.72%; n = 447) and the team (92.29%; n = 431), and 76.45% of respondents (n = 357) wished to participate in an interprofessional training.

Conclusions: Results of this study confirm that communication skills are perceived as highly important for professional life. Students and trainees show a great interest in

communication skills and interprofessional training. The findings indicate that appropriate adjustments to existing curricula are necessary in Germany.

Keywords: Communication skills, Interprofessional education, Veterinary and veterinary-related professions, Professional skills training

MedEdPublish 2020, DOI: https://doi.org/10.15694/mep.2020.000113.2

The online inverted classroom model (oICM). A blueprint to adapt the inverted classroom to an online learning setting in medical and health education [version 2]

Daniel Tolks[8,17], Bernd FM Romeike[7,10], Jan Ehlers[2,12], Sebastian Kuhn[3,13], Christin Kleinsorgen[6,16], Johanna Huber[1,9], Martin R Fischer[1,9], Christoph Bohne[5,15], Inga Hege[4,14], Luisa Merz[11], Michael Sailer[18]

[1]Institute for Medical Education of the University Hospital
[2]Institute for Medical Education of the University Hospital
[3]Academic Dean's Office
[4]Academic Dean's Office
[5]Didactics and Educational Research in Health Science
[6]Didactics and Educational Research in Health Science
[7]Department of Orthopaedics and Traumatology
[8]Department of Orthopaedics and Traumatology
[9]Centre for E-Learning
[10]Centre for E-Learning
[11]Institute for Medical Education of the University Hospital
[12]Institute for Medical Education of the University Hospital
[13]Brandenburg Medical School Theodor Fontane
[14]Brandenburg Medical School Theodor Fontane
[15]Department for Medical Education Sciences
[16]Department for Medical Education Sciences
[17]Center for International Health CIH
[18]Education and Educational Psychology

The idea of this paper is to offer a blueprint, to guide educators setting up a complete digital teaching scenario according to the latest insights of educational research.
The COVID-19 pandemic forced higher education institutions all around the world to radically shift their curricula from a mix of face-to- face and remote teaching methods to a fully remote curriculum. Though challenging, this time provides opportunities to implement new educational methods and to improve the quality of digital teaching. The concept of the inverted classroom was modified to meet the special needs of the new online settings. The proposed online Inverted Classroom Model (oICM) includes the following phases: (1) pre-phase, (2) self-learning-phase, (3) synchronous online phase, (4) transfer-phase, and (5) evaluation. Recommendations and potential tools are provided for each phase. The oICM is an innovative and easy to use approach to shape digital teaching and learning processes during and after the COVID-19 pandemic. This blueprint is developed by the committee “Digitalization” of the German Association for Medical Education (GMA), mainly for educators who are familiar with the Inverted Classroom Model (ICM) or similar blended learning formats.

Keywords: inverted classroom, flipped classroom, oICM, medical education, health education, digital teaching, synchronous online teaching

GMS J Med Educ 2021;38(3):Doc61; doi: 10.3205/zma001457

Communication and animal observation in livestock farming – pilot study of a teaching project in veterinary education

Sara Trittmacher[1], Anne Schnepf[2], Christin Kleinsorgen[3], Henrik Detlefsen[4], Johannes Hessler[5], Amely Campe[6], Isabel Hennig-Pauka[7]

[1]Stiftung Tierärztliche Hochschule Hannover, Außenstelle für Epidemiologie in Bakum, Bakum, Germany
[2]Stiftung Tierärztliche Hochschule Hannover, Institut für Biometrie, Epidemiologie und Informationsverarbeitung, Hannover, Germany; Stiftung Tierärztliche Hochschule Hannover, WHO Collaborating Centre for Research and Training for Health at the Human-Animal-Environment Interface, Hannover, Germany
[3]Stiftung Tierärztliche Hochschule Hannover, ZELDA - Zentrum für E-Learning, Didaktik und Ausbildungsforschung, Hannover, Germany
[4]Tierarztpraxis Bethen, Cloppenburg, Germany
[5]TPL Tierarztpraxis Lastrup-Löningen, Lastrup, Germany
[6]Stiftung Tierärztliche Hochschule Hannover, Institut für Biometrie, Epidemiologie und Informationsverarbeitung, Hannover, Germany; Stiftung Tierärztliche Hochschule Hannover, WHO Collaborating Centre for Research and Training for Health at the Human-Animal-Environment Interface, Hannover, Germany
[7]Stiftung Tierärztliche Hochschule Hannover, Außenstelle für Epidemiologie in Bakum, Bakum, Germany

Objective: Within the scope of a teaching project, students of veterinary medicine are to study animal and environmental observation and how to communicate with the persons responsible for animals on pig farms. They will be prepared to reflect on conversational behavior, identify difficult conversational situations and solve them in a goal-oriented way. In addition to piloting, the the aim of the study is to evaluate the teaching project by the students and the teaching staff.

Methodology: Animal observation is trained using a virtual tour of a stock farm based on pictures and videos. The didactic approaches Design Thinking and the creative Walt Disney method are used in order to work on a previously prioritized problem. A typical conflict situation in pig farming is simulated in a role-play. Acquired skills are put into practice during a stock examination on the practice day, where the students communicate their observations. Evaluation is conducted using paper-based questionnaires and feedback interviews.

Results: Evaluations of the students are generally positive. The desire to include communication studies in the curriculum was expressed several times. For the theoretical teaching units, a larger group of participants is needed to achieve higher interaction through diversity. The acquired knowledge is reliably applied and utilized on the practice day.

Conclusion: The theoretical teaching units extensively prepare the students for the practical stock examination and teach basic skills of communication. Some adjustments to the procedure and focus should be made regarding the practical part.

Generally, the conveyed information and methods are considered to be important by the students.

Keywords: communication, stock examination of pigs, animal observation, patient-centered training

J Vet Med Educ. 2021 Jan 25;e20190068. doi: 10.3138/jvme.2019-0068.

Motivation and Experience Matters: What Veterinary Mentors Think About Learning Communication Skills: A Qualitative Study

Silke Gaida[1], Marc Dilly[2], Andrea Tipold[3], Anja Härtl[4]

[1]Veterinary Practitioner, Tiergesundheitszentrum Isernhagen [Animal Health Centre], Burgwedeler Str. 71a, 30916 Isernhagen, Germany
[2]Head of Scil Vet Academy, Dina-Weißmann-Allee 6, 68519 Viernheim, Germany
[3]Vice-President for Teaching, Small Animal Clinic, University of Veterinary Medicine, Foundation, Bünteweg 9, 30559 Hannover, Germany
[4]Head of the Faculty Development Team; Department for Medical Education and Educational Research, Faculty of Medicine, University of Augsburg, Universitätsstr. 2, 86159, Augsburg, Germany

Communication skills are a core competence in veterinary medicine. These skills play a pivotal role in professional success in the animal health professions. Over the last few decades, there has been an increased focus on communication skills in veterinary curricula. Conversely, we know less about the knowledge and motivation behind the communication skills of those veterinarians in different work domains who are acting as mentors outside the university. In 2016, semi-structured interviews (n = 16) were conducted with German practitioners in workplaces ranging from companion to farm animal practice, and throughout the veterinary industry, veterinary research, and government service. We combined two qualitative methods: a thematic analysis approach and the generation of types to identify characteristics associated with the acquisition of communication skills. In the current study, three main themes were developed: “Motivation,” “Experiences with the acquisition of communication skills,” and “Communication skills training during formal education.” Within the identified themes, we recognized three types of communicators: “self-experienced,” “extrinsic-experienced,” and “unexperienced.” We found that acquisition of communication skills was closely linked to motivation; therefore, motivation must be considered when developing communication skills curricula for learners and educators. By extrapolating the findings of this explorative study, we determined that intrinsically motivated mentors from the field should be a main source of veterinary education to promote further development in communication training. This qualitative study also determined that most non-university veterinary mentors had only a basic knowledge of teaching and learning communication skills, leading us to recommend formal

training. Interchange between practicing veterinarians and veterinary educators and curriculum coordinators can foster relevant curricular modifications.

Key words: training of communication skills, undergraduate education, curriculum development, motivation of learning

Berliner und Münchener Tierärztliche Wochenschrift (134) 1–17 (2021), doi: 10.2376/1439-0299-2021-6

Development and evaluation of a simulator for training of ultrasound-assisted transrectal gynecological examination of cattle

Silja Brombacher-Steinert, Yasmin Gundelach, Maike Heppelmann, Letizia Debertolis, Andrea Tipold, Sandra Wissing

Aim of this study was to create a simulator for bovine transrectal gynecologic sonographic examination (TSE) regarding cycle determination and its evaluation. Based on the commercially available simulator “Breed’n Betsy®” (“BnB®”), the Ultrasonic Cow Simulator (UCS) with organs of the abdominal and pelvic cavity was created of ultrasound-conductive materials. UCS was questionnaires-based evaluated by three experimental groups (group 1: students 2nd/3rd semester; group 2: students 9th/10th semester; group 3: veterinarians). Palpatory properties of the UCS were evaluated by all experimental groups and compared with “BnB®» by groups 1 and 3. Group 2 and 3 evaluated sonographic properties of UCS. Additional data on self-efficacy and objective performance on live animals were collected by group 2.

In total 266 probands participated (group 1 n = 190; group 2 n = 58; group 3 n = 18). The UCS palpatory properties were rated as good (group 1: 94.74%; group 2: 73.33%; group 3: 77.78%). Compared to “BnB®” the UCS was perceived as more realistic by 94.21% of group 1 and 100% of group 3. 96.67% of group 2 and 77.78% of group 3 rated the sonography as good. In objective performance testing on living animals, experienced students performed better. Self-efficacy ratings of the training group were higher (p = 0.0530).

TSU is challenging for many students, in part because live animal practice opportunities are often limited. The newly developed simulator for TSE allows training of this skill and can be directly integrated into veterinary medicine studies.