Teaching Academy
Consortium of West Region CVM

Building a Culture of Excellence in Teaching & Learning

2015 SUMMER CONFERENCE

MAKING THE TEACHING ACADEMY MATTER

Welcome,

On behalf of the Teaching Academy of the Consortium of West Region Colleges of Veterinary Medicine, our 5 sponsoring deans, and our corporate partner Zoetis, we are proud to present the 2015 summer conference "**Building a Culture of Excellence in Teaching & Learning**." This interactive two-day conference is designed to bring together the people who share a passion for teaching and learning in our colleges, and to facilitate collaboration between schools.

Our larger goal is to "Make Teaching Matter" and to make teaching a viable and valued career track. Our deans have asked us to work together to solve shared problems and help bring about change – notably by giving faculty and college leaders the skills, tools, and measures that will be needed to challenge existing paradigms.

The program has 4 primary pieces:

1. **Faculty development** – This year we are featuring two workshops led by **Dr. Lynne Robins,** Director of the University of Washington, School of Medicine, Teaching Scholars Program. The first will help us articulate our Teaching Philosophy and Self-Assessment for a teaching portfolio. The second will provide basic information about diverse instructional research.

2. **Networking** – Several activities have been designed to help build cross-campus collaborations between individual faculty members. We hope this kind of collaboration will be an important outcome of the Academy, and ask that any collaborative enterprises that result be documented and reported.

3. **Scholarship** – The biannual meeting will provide a formal venue whereby Fellows can present their work/ideas to peers outside their own institution.

4. **Project Development** - A critical goal of the conference is to provide feedback to our two working groups on two major projects of the Regional Teaching Academy. The group's projects represent regional collaboration to leverage real change in each of our 5 colleges. The conference will also provide a venue for brainstorming our next major initiative.

Welcome to Pullman! Bring your passion to learn, willingness to share, creative energy and an open mind. Together, we will make a difference.

"Twenty years from now you will be more disappointed by the things that you didn't do than by the ones you did do. So throw off the bowlines. Sail away from the safe harbor. Catch the trade winds in your sails. Explore. Dream. Discover."
--Mark Twain

STEERING COMMITTEE MEMBERS

Chair:
Johanna (Joie) Watson, UC

Chair Elect:
Kristy Dowers, CSU

Treasurer:
Dean Hendrickson – CSU

Executive Coordinator:
Rachel Halsey – WSU

Terri Clark – OSU

Jana Gordon - OSU

Steve Hines, WSU

Suzie Kovacs - WU

Jan Ilkiw – UCD

Phil Mixter - WSU

Peggy Schmidt – WU

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SCHEDULE OF EVENTS

Wednesday, July 22nd

2:00 pm	**Working Group Meetings**	
	- External Review Committee	Residence Inn – Crimson Room
	-Faculty Development Committee	Residence Inn G
6:00 pm	**School Spirit Wine Tasting and Social**	[Banyan's on the Ridge](#)
	Wear your school spirit for an evening of fun and a taste of Washington wines.	1260 Palouse Ridge Dr Pullman, WA

Thursday, July 23rd

8:00 am	Welcome	ADBF 1002
8:15 am	**Keynote Workshop**: "Declarative Sections of Your Teaching Portfolio: Making the Most of Your Look in the Mirror"	ADBF 1002
10:00 am	**Faculty Development Working Group**: "VETS - Veterinary Educator Training and Scholarship – Coming soon to your institution!"	ADBF 1002
10:30 am	*Break*	
10:45 am	**External Review Working Group Presentation**: "Changing the institutional paradigms so that teaching <u>can</u> matter"	ADBF 1002
11:15 am	**Idea Exchange**- University of California - Davis	ADBF 1002
11:30 am	Lunch Sponsored by Elsevier	ADBF Lobby
12:30 pm	**Idea Exchange**- Oregon State University	ADBF 1002
12:45 pm	Choosing a New TA project: Step 1 - Creative Brainstorming and Idea Refinement	ADBF 1002

1:45 pm	**Idea Exchange**- Colorado State University	ADBF 1002
2:00 pm	*Break*	
2:15 pm	**Working Group Parallel Workshop**	
	External Review Working Group Workshop: "Small group discussion of the external review template; collaboratively charting our next steps"	Bustad 145
	Faculty Development Working Group: "VETS - Veterinary Educator Training and Scholarship – Coming soon to your institution!"	ADBF 1002
5:30 pm	*Break*	
6:00 pm	Microbrew Tasting Social *Featuring local breweries*	Ensminger Pavilion
6:30 pm	Dinner	

Friday, July 26[h]

8:00 am	Idea Exchange – *Washington State University*	ADBF 1002
8:15 am	Scholarship Presentation (3)	ADBF 1002
9:00 am	Idea Exchange – *Western University*	ADBF 1002
9:15 am	*Break*	
9:30 am	Scholarship Presentation (3)	ADBF 1002
10:15 am	**Educational Research Workshop:** "An Introduction to Educational Research"	ADBF 1002

12:00 pm	Lunch	ADBF 1002
1:00 pm	Choosing a New TA Project: Step 2—Consensus Based Decision-Making	ADBF 1002
2:30 pm	*Break*	
2:45 pm	Future Directions of the RTA	ADBF 1002
5:00 pm	Closing Business Meeting and Committee/Project Assignments	ADBF 1002

CONFERENCE DETAILS

Keynote Workshop Speaker:

Dr. Lynne Robins, PhD is Professor, Department of Biomedical Informatics and Medical Education at the University of Washington School of Medicine and Director of the Teaching Scholars Program.

Dr. Lynne Robins is passionate about faculty development. Dr. Robins is a full professor in the Department of Biomedical Informatics and Medical Education at the University of Washington School of Medicine's (UWSOM's) and directs the UWSOM Teaching Scholars Program. This program fosters professional development of educational leaders and community building among the UWSOM faculty. In addition, Dr. Robins takes active roles in the current curriculum renewal program across UWSOM, working with faculty to develop innovative curricula for learners and implement change in a diverse array of medical instructional settings.

KEYNOTE WORKSHOP: "DECLARATIVE SECTIONS OF YOUR TEACHING PORTFOLIO: MAKING THE MOST OF YOUR LOOK IN THE MIRROR"

Topic: Participants will work specifically on their self-declarative statements including their Teaching Philosophy and Self-Assessment writing. During these workshop sessions, participants will learn about best practices, options and gain useful peer feedback on drafts they bring to this session. Participants will leave the session with improved components of their portfolios, ideas for future improvement and strategies to constantly reflect their personal instructional styles in these writings.

EDUCATIONAL RESEARCH WORKSHOP: "AN INTRODUCTION TO EDUCATIONAL RESEARCH"

Topic: Participants will gain basic information about diverse instructional research and explore the feasible scholarship opportunities within their own instructional activities. This session will allow participants to brainstorm possible projects to collect evidence about their own instruction, providing evidence for improvement. Participants will learn about various data collection strategies, assessment options and modes for disseminating their scholarship.

Working Group Workshops: Thursday

External Review Working Group Workshop: Small group discussion of the external review template; collaboratively charting our next steps

Topic: During the External Evaluation sessions, participants will become familiar with the guidelines assembled by the working group for preparation of recommended items prior to external evaluation for promotion and tenure. This will include a hands-on session focused on the Educator's CV (also known as the Teaching Vitae), a comprehensive document encompassing all an instructor's activities, as well as the Teaching Portfolio, an in-depth spotlight of several key areas of the educator's instructional work. Participants will examine and discuss the current prompts for these documents, assess their applicability in their home institutions, and collaboratively chart next steps towards developing a rigorous external peer review process that helps to "make teaching matter." These sessions will also allow participants to reflect on their own educational documents and teaching.

Faculty Development Working Group: "VETS - Veterinary Educator Training and Scholarship – Coming soon to your institution!"

Topic: "How I teach, Who I teach, What I teach" – Please join us for an interactive session geared toward understanding yourself as an educator and your students as learners. You will also be introduced to several theoretical frameworks that will help guide you in creating your teaching goals and learning objectives.

Idea Exchanges: Thursday and Friday:

A series of short, informal presentations intended to maximize exchange of information about new developments, teaching experiments, and/or areas of interest for further exploration at the Consortium institutions.


Collaborative Brainstorming: Reaching Consensus on a New Working Group Project

Two sequenced working sessions designed to identify one NEW working group project that will engage collaboration among fellows of the regional Teaching Academy in 2015-16. Our goal is to leave Pullman with another working group focused on another target, assemble group leaders, and have a first meeting to put appropriate mandates in place.

Session 1 – Thursday: Creative Brainstorming and Idea Refinement

This first session will engage participants in creatively brainstorming possible ideas within the group that can be refined into a new working group project. Facilitator led, this brainstorming session is intended to cooperatively generate ideas, visually organize these ideas into common themes, and in small groups prepare these ideas for consideration in Session 2 as the new working group project.
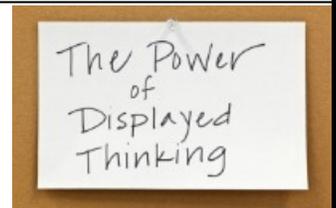
Session 2 – Friday: Focusing on a New Project—Consensus Based Decision-Making

In Session 2 we will begin with the main ideas generated and refined in Session 1 (Creative Brainstorming and Idea Refinement) and by working together through a facilitator led consensus protocol, we will emerge with one new working group project for the coming year.

Preparation Material:

Creative Brainstorming - [Introduction to Coggle](#)

Scholarship Sessions: Friday

Presentations of scholarly educational works will be accepted for short oral presentation at the 2015 Summer Conference of the Teaching Academy. Submission of a structured abstract is required for consideration for an oral presentation during scholarship sessions. The structured abstract must include the title of the research paper, the author's names and affiliations and the following components (limited to 500 words): (1) Purpose; (2) Method; (3) Results; (4) Conclusions. Name and email contact of the lead presenter must be included. Both completed projects and projects in progress (in process of data analysis) will be considered.

SCHOLARSHIP SESSION:

SUBMITTED ABSTRACTS:

Presenter	Institution	Title
Munashe Chigerwe	University of California - Davis	Assessment of burnout in veterinary medical students using the Maslach Burnout Inventory-Educational Survey: a survey during two semesters.
Robert Keegan	Washington State University	Use of a mobile device anesthetic dosing problem generator (VCalc®) as a class exercise.
Ohad Levi & Dean Hendrickson	Western University of Health Sciences & Colorado State University	Comparison of Short-term versus Long-term Video Game Training Programs to Enhance Basic Laparoscopic Skills of Veterinary Medicine Students
Phil Mixter	Washington State University	Motivation and Attitudes
Craig Ruaux	Oregon State University	Revisiting Communication Readiness: Influence of OSCE Timing and Student Gender on Self-Efficacy and Burnout Stress
Martin Smith	University of California, Davis	Investigating Lesson Study as a Professional Development Model for Science Educators

See page 14 for full abstracts of the Scholarship Presentations

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Matthew	Susan	Susan.matthew@sydney.edu.au	Washington State University
Noyes	Julie	Dr.JulieNoyes@gmail.com	Washington State University

COMMITTEE DETAILS:

Steering Committee:

The Steering Committee is the governing force that directs the detailed functions and affairs of the Teaching Academy. The duties of the steering committee are to oversee the activities of the academy; serve as Academy Liaisons for their respective colleges; determine priorities; approve budgets and identify resources; establish benchmarks and metrics to determine success; and promote the teaching mission of the Academy.

The Steering Committee consists of two representatives from each of the Consortium member colleges. Initial members of the Steering Committee were appointed by their respective Deans with one serving a two-year term and one serving a three-year term. Thereafter, members will be elected in alternate years by a majority vote of the membership from the respective college and shall serve a two-year term.

Membership Committee:

The Membership Committee is responsible for evaluating applications for membership and making recommendations to the academy for appropriate action. This committee will review

and update the application process and the membership roster annually. The committee will be chaired by a member of the Academy Steering Committee. Membership will consist of two members from each consortium institution, nominated and elected by the membership from that institution.

Biannual Meeting Planning Committee:

The Biannual Meeting Planning Committee is responsible for planning a biannual meeting of the academy.   Members of this committee include a representative from each institution and a few more members from the hosting institution.   The location of the meeting will rotate among the five institutions.

Working Group – Project Based:

The expectations for the working groups are to make significant progress in the coming year on the chosen TA projects. The group(s) will meet regularly by electronic means and receive travel support to meet face-to-face at least once, possibly in conjunction with a Steering Committee meeting. The group(s) will also have administrative assistance to help them stay on track and reach their end goal.

Faculty Development Working Group:

While at the 2015 Summer Conference you will have the opportunity to participate in a Veterinary Educator Training and Scholarship Course. The session will focus on teaching and learning perspectives; thus, please complete the Teaching Perspectives Inventory, which will help you determine your personal perspectives on teaching and learning.

External Review of Teaching Working Group:

This working group (WG) seeks to be a "game changer" in our profession by creating a rigorous external review process that validates teaching, educational scholarship, and educational leadership as a valued and rewarded career track. In its first 2 years, the WG worked with previously described medical school models to develop templates by which applicants for promotion and/or tenure might effectively and consistently present their teaching related activities for review. These documents will be presented for discussion at the 2nd biannual TA meeting in Pullman. The next steps (to be decided collaboratively) likely involve (a) development of a deployable training program to help instructors prepare these documents, (b) construction of rubrics to foster critical and consistent review of submitted documents, (c) development of a training program to train external reviewers, and (d) design of a sustainable external review process that the 5 member colleges might all utilize (e.g. a regional panel of trained reviewers).

PRE-CONFERENCE ASSIGNMENT

All pre-conference assignment can be found on this website, and include the following:

- ## **Creative Brainstorming:**
    o An Introduction to Coggle in preparation for the Summer Conference sessions dedicated toward determining a focus for a new working group project.

- ## **External Review of Teaching Working Group:**
    o Prior to the Thursday afternoon workshop, we ask that participants briefly review the short document that provides an overview of the external review templates for submission of teaching packets. LINK HERE. This document will provide participants with a "big picture" view of the materials and allow everyone to consider the 6-8 "domains" in which activity and effectiveness might be documented for the purpose of external peer review. In our collaborative session on Thursday afternoon, we will use more detailed versions of this document to assess an example promotion packet and, through that exercise, discuss the working group's templates. We will also discuss potential next steps in making external review of teaching a reality in our 5 colleges.

- ## **Faculty Development Working Group:**

    o Complete the Teaching Perspectives Inventory (TPI) - (the results will be presented during the conference to help clarify your perspectives on Teaching and Learning).

    > The session leaders, Laurie Fonken, Peggy Schmidt, and Paul Gordon-Ross will request the aggregate data for the attendees, but please print and bring your individual results for reference during the discussion. The aggregate results will provide discussion points for the group and will be compared to other healthcare professions.

    > **Directions:**

    > 1) Go to http://www.teachingperspectives.com/tpi/
    > 2) Select "Take the TPI" in the middle of the screen.
    > 3) Read the TPI welcome.
    > 4) Please type your first and last name as well as your institutional email.
    > 5) Please select "VETS – Faculty Development" as the group.
    > 6) Complete the TPI.
    > 7) Print and bring your results to the conference.

    > **NOTE:** Please use your institutional email. The TPI developers will provide us with an aggregate report, but they will only pull the results of

those with the emails we provide and who have selected the VETS – Faculty Development group.

- **Lynne Robbins:**
  - **Teaching Portfolio Workshop:** Bring current documents for editing *(electronic or paper)*

SCHOLARSHIP ABSTRACTS

Munashe Chigerwe
University of California-Davis
Completed project

Assessment of burnout in veterinary medical students using the Maslach Burnout Inventory-Educational Survey: a survey during two semesters. Munashe Chigerwe*, Karen A. Boudreaux** and Jan E. Ilkiw****Medicine and Epidemiology, University of California-Davis, School of Veterinary Medicine, Davis, CA USA; **Dean's Office, University of California-Davis, School of Veterinary Medicine, Davis, CA USA; ***Surgical and Radiological Sciences and Dean's Office, University of California-Davis, School of Veterinary Medicine, Davis, CA USA

Purpose: Burnout among veterinary students can result from known stressors in the absence of a support system. The objective of this study was to evaluate use of the Maslach Burnout Inventory-Educator Survey (MBI-ES) to assess burnout in veterinary students.

Methods: The MBI-ES was administered to first (Class of 2016) and second year (Class of 2015) veterinary medical students during the 2012-2013 academic year in the fall and spring semesters. Factor analysis and test reliability for the survey were determined. Mean scores for the subscales determining burnout namely emotional exhaustion (EE), depersonalization (DP) and lack of personal accomplishment (PA) were calculated for both classes in the 2 semesters. Multiple regression analysis was performed to evaluate other factors that predict the MBI-ES scores.

Results: A non-probability sampling method was implemented consisting of a voluntary sample of 170 and 123 students in the fall and spring semesters, respectively. Scores for EE, DP and PA were not different between the 2 classes within the same semester. Mean ± SD scores for EE, DP and PA for the fall semester were 22.9 ± 9.6, 5.0 ± 4.8 and 32.3 ± 6.7, respectively. Mean ± SD scores for EE, DP and PA the spring semester were 27.8 ± 10.7, 6.5 ± 6.1and 31.7 ± 6.8, respectively. The EE score was higher in spring compared to fall while DP and PA scores were not different between the 2 semesters. Living arrangements specifically as to whether or not a student lived with another veterinary medical students was the only

variable significantly associated with the MBI-ES scores. Students in this study had moderate levels of burnout based on the MBI-ES scores.

Conclusions: The MBI-ES was an acceptable instrument for assessing burnout in veterinary medical students. The EE scores were higher in the spring semester as compared to the fall semester. Thus students in the first and second years of veterinary school under the current curriculum experience the greatest levels of emotional exhaustion during the spring semester. This has administrative implications for the school, when considering the allocation and use of resources for student support systems during each semester.

Robert Keegan
Washington State University
Completed project

Use of a mobile device anesthetic dosing problem generator (VCalc®) as a class exercise. - RD Keegan, WSU; S Bullers, WSU; GR Brown; JM Gay, WSU

Background: The ability to accurately and quickly perform anesthetic drug and infusion rate calculations is an essential skill that must be mastered by veterinary students, yet many students view these calculations as being difficult, tedious and unengaging. In response to student requests for practice problems we have created a mobile device-based anesthetic problem generator with the goal of improving student engagement while providing practice problems on demand. VCalc combines a dose, fluid rate, and infusion problem generator with a cloud-based database to record student attempts as well as the number of problems of each type that were answered correctly. Methods: One hundred twenty eight veterinary students enrolled in an anesthesia course were studied to evaluate the acceptance and learning efficacy of the application. Students were assigned to install the application onto their personal phone, tablet or PC and complete three problems of each type (9 total). Subsequent to attempting the 9 problems on the app, students completed an examination which included 4 calculation questions (1 Drug, 1 Fluid, 2 Infusion calculations). After completing the examination, students submitted a survey of attitudes and opinions concerning the applicability and usefulness of the app. Results: All students installed or accessed the app and attempted at least one of the problems. The 128 students enrolled in the class attempted 2337 total problems, averaging 7.4, 7.4 and 6.5 Drug, Fluid and Infusion problems per student respectively. Students correctly answered a total of 1400 problems, averaging 5.0, 4.5, and 3.3 Drug, Fluid and Infusion problems per student answered correctly. The 4 exam calculation questions were all answered correctly by greater than 92% of the students. The survey indicated that a majority of students found that the app was useful or very useful for practicing anesthetic drug calculations and would like to see more apps developed and used within the curriculum. Finally, 77% of students reported that they had used the app to study for the exam. Conclusions: The VCalc practice app was perceived as a useful and engaging instructional tool and was used by a majority of students to study for the exam. Students wished to see more apps developed and used within the veterinary curriculum. The VCalc application is available for Android, iOS and Windows platforms.

Ohad Levi + Dean Hendrickson
Western University of Health Sciences & Colorado State University
In Progress

Comparison of Short-term versus Long-term Video Game Training Programs to Enhance Basic Laparoscopic Skills of Veterinary Medicine Students - Ohad Levi1; Dean Hendrickson2; Mark Battles1; Peggy Schmidt1; Dominique Griffon1; Maria Fahie1; Donna Shettko2 (1 CVM - Western University of Health Sciences & 2 CVM - Colorado State University)

Purpose:

1. Determine the correlation between length of training time with video games and improvement in laparoscopic basic skills of veterinary medicine students.

2. To evaluate the implementation of video game training models into the basic laparoscopy skills training program to veterinary medical students

Material & Methods: Students completing their first and second years of the veterinary curriculum at CVM-WU (n=31)and CVM-CSU (n=21)with no previous experience with laparoscopic surgery or any other minimally invasive surgery, nor any previous experience with the video game used in this study (Marble Mania for the Nintendo Wii) were invited to participate in this study. Participants completed a questionnaire before and after the study self-assessing their prior video game experience and confidence level to perform laparoscopic basic tasks. Students meeting the inclusion requirements were block randomized into two groups by year in school, then by gender. Students' basic laparoscopic skills were assessed by a veterinary surgeon as they performed two tasks from the previously validated scoring system the McGill Inanimate System for Training and Evaluation of Laparoscopic Skills (MISTELS). One group (Group L) played the video game Marble Mania on the Nintendo Wii at their own homes for 3 hours per week for the next 6 weeks (18 hours in total). The second group (Group S) only played Marble Mania for 3 hours on the 6th week (3 hours in total). After the 6 weeks of training with Marble Mania, participants then performed the same two basic laparoscopic tasks and were assessed using the same scoring system by the same evaluator.

Results: Both groups S and L showed statistically significant (p value <0.05) improvement on both laparoscopic tasks, the peg transfer and the Pattern cutting, following their video game training with Marble Mania.

Although group L scored higher than group S in both laparoscopy tasks on both assessments (pre-video game training and post-training peg transfer and pattern cutting tasks), the differences between the groups were not statistically significant.

Conclusions and Clinical Relevance: Results of the present study indicate that playing video games was an effective method for veterinary students to acquire laparoscopic basic skills on box trainers. Both the short training group (S) and the long training group (L)

improved in their basic laparoscopic skill scores. Unexpectedly though, the degree of improvement of both groups was not significantly different. Perhaps three hours of video gaming with Marble Mania is enough to improve basic laparoscopic skills and sixteen hours of training is unnecessary. The results of our study demonstrate that video game training is helpful to acquire proficient basic laparoscopic skills and implementing video game training as part of the veterinary curriculum to train students in laparoscopic surgery skills is feasible.

Phil Mixter

Washington State University
In Progress
Collaboration with Colorado State University

Motivation and Attitude - Phil Mixter (WSU School of Molecular Biosciences) and Jennifer LeBeau (WSU College of Education)

Between now and 2018, Washington is projected to be the second highest state in the nation in the percent of all jobs created that will require a degree in a Science, Technology, Engineering, and Math (STEM) discipline. Further, 70% of all jobs in Washington will require a STEM Bachelor's Degree by 2018. Yet, many graduating college students enter the workforce either underprepared or without STEM interest, despite exiting a STEM program. Therefore, retention of STEM graduates in STEM-related occupations is a great concern.

The Microbiology B.S. degree at Washington State University (WSU), managed by the School of Molecular Biosciences (SMB), has produced high quality graduates pursuing post-baccalaureate training. According to 2012 focus groups, 75% of graduating microbiology majors at WSU plan to gain additional education at the graduate or professional level, while the other 25% plan to train in a Medical Technology program. To date, however, there has been little assessment of the motivation, attitudes, and retention of SMB microbiology students toward their interest in or decisions to pursue STEM careers.

We present work-in-progress piloting an instrument that measures the perceptions and attitudes of students in the SMB Microbiology degree program. The instrument is a modification of the engineering-based Motivation, Attitudes, and Retention Survey (MARS) developed by Switzer and Benson (2007). A small cohort of microbiology students have used the new instrument, providing preliminary data with limited statistical power for validation. Plans for including a parallel cohort at Colorado State University (CSU) to gain statistically relevant numbers are presented.

Craig Ruaux

Oregon State University
Complete

Revisiting Communication Readiness: Influence of OSCE Timing and Student Gender on Self-Efficacy and Burnout Stress - Craig Ruaux, Veterinary Clinical Sciences, Oregon State University; Terri Clark, Biomedical Sciences, Oregon State University; Sue Tornquist, Biomedical Sciences, Oregon State University

Purpose: Development of client communication skills is critically important in the training of students preparing to enter professional veterinary practice. The large number of species that veterinarians may be called upon to treat and the differing expectations of pet animal owners versus production animal clients are complicating factors for client communication training in veterinary students. Development of client communication skills for pre-clinical veterinary students typically involves the use of role-play, small group discussion, and interactions with standardized clients. The aim of the study reported here was to assess the effects of standardized client interaction timing and student gender on burnout stress and client communication self-efficacy in pre-clinical veterinary medicine students.

Methods: A 30-question survey instrument assessing communication self efficacy, personal, and work-related burnout stress was deployed to two groups of preclinical veterinary students (n=53 in group one, n=57 in group two) at the beginning and end of a 10-week course teaching communication skills. Interactions with standardized clients were carried out before the second survey in the first group of students, while the second group completed the second survey after the interaction with standardized clients. Multivariate ANOVA was used to assess the effect of interaction timing and gender on client communication self-efficacy and burnout stress.

Results: Strong interactions between the effects of interaction timing and gender were detected, with male students showing a significant decline in client communication self-efficacy when the client interaction occurred before the administration of the final survey instrument. Female students showed a marked improvement in client communication self-efficacy when the interaction occurred before administration of the survey. Burnout stress was high in many students. Male students completing the survey instrument after client interaction showed significant increases in burnout stress when compared to female students, regardless of timing, and male students completing the survey instrument before client interaction.

Conclusions: The timing of standardized client interactions relative to assessment of communication readiness must be carefully considered. Male pre-clinical veterinary students may show declining communication efficacy and increasing burnout stress following standardized client interactions.

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Investigating Lesson Study as a Professional Development Model for Science Educators- Martin H. Smith, University of California - Davis

Effective science programs require effective teaching. Lesson study, a constructivist-based professional development model, is a potential strategy to help advance educators' knowledge and skills and improve student learning. Lesson study engages educators in developing an inquiry stance on their practice through active reflection, is situated in authentic contexts, and occurs incrementally over time. Specifically, educators involved in lesson study work in teams to formulate goals, improve specific lessons within discrete contexts, and explore deeper issues surrounding teaching and learning (Rock & Wilson, 2005; Lewis, 2002; Lewis, Perry, & Hurd, 2004; Lewis, Perry, Hurd et al., 2006; Lewis, Perry, & Murata, 2006). By adopting an inquiry stance on their practice that involves the systematic collection, analysis, and reporting of data, educators design, test, and revise one or more lessons (Lewis, 2002; Rock & Wilson, 2005; Stigler & Hiebert, 1999; Wiburg & Brown, 2007). "Inherent in the process…is the belief that discussing others' points of view enhances the learning process and the final product" (Loucks-Horsley et al., 2003, p. 186).

A sequential explanatory mixed methods design was used to investigate the influence of lesson study on 4-H volunteers' understanding and use of inquiry methods and veterinary science content knowledge. Survey data were analyzed using a repeated measures general linear model (GLM) which showed a significant effect of time with respect to both constructs. Thus, lesson study improved subjects' teaching practice and subject matter knowledge. Focus group interview data were collected to expand upon quantitative outcomes. Themes from qualitative data were identified and categorized using the long-table approach. Qualitative outcomes elaborated on participants' understanding and use of inquiry processes, including questioning strategies, learner-centered explorations, and knowledge application. Results from this study could benefit educators and researchers in other contexts.