Title: Advancing Communication of Animal Health Professionals: A Transition in a Veterinary Curriculum from Paper Notes to Paperless Notes and TabletPCs

Speaker/Author: Cindy Logan, Assistant Professor and Manager, Digital Instruction, Support, and Creative (DISC) Services, Veterinary Medical Library, Kansas State University, 408 Trotter Hall, Manhattan, KS 66506 USA

ABSTRACT

Objectives: Using new technologies and software, K-State’s College of Veterinary Medicine implemented an electronic notes initiative into the veterinary curriculum. The goal is to create improved lifelong learners who are able to adapt to new technologies as veterinary professionals.

Methods: Implementation began August 2007 with the freshman class and continues each fall with the freshman class. The students received the same tabletPC model and preloaded software. Hardware and software instructional sessions were held prior to the start of classes and initially DISC instructors were in the classroom. Surveys were given throughout the academic year to determine the strengths, weaknesses, and areas of improvements on the initiative. The attitudes of the students and the teaching instructors will be measured over time and after student graduation.

Results: Positive attributes were: ease of transporting notes, ease of the search feature, and ability to search the Internet to supplement class discussions. Requested needs were: earlier distribution of tabletPCs during Orientation Week, more instructional sessions prior to classes, larger backup drives, more memory, and the need for notes in original format to allow students to choose how to organize them.

Conclusion: The paperless curriculum initiative was well received by the students and faculty of the freshman class. The collaborative effort of the computer support staff and DISC instructors can be recognized as leading the way for the success. Students will continue to be surveyed to gauge their attitudes and concerns as well as to determine if the objectives of the curricular transition are met.
The College of Veterinary Medicine is one of nine colleges at Kansas State University in Manhattan, Kansas. Kansas State University originated in 1858 when Bluemont Central College was founded. After the passage of the Morrill Act of 1862, it became the first college in America to be designated as a land-grant school. The Morrill Act granted states land, which had been federally controlled, in order to teach agriculture, science, and engineering. In 1905 the veterinary curriculum changed from two years to four years and became a Doctor of Veterinary Medicine degree. When the first students graduated in 1907, there were seven graduates. Now there are 105-110 graduating students.

Celebrating its centennial in 2005, the College of Veterinary Medicine is the sixth oldest veterinary college in the United States. The first female veterinary medicine student was Helen Richt who graduated in 1932. In 1988, the number of first year female veterinary students exceeded the number of first year male veterinary students. That trend continues to this day.

Eight past graduates of the College of Veterinary Medicine went on to become president of the American Veterinary Medical Association. Other notable graduates of the College are Drs. Jerry (1972) and Nancy (1973) Jaax, former United States Army veterinarians. They were vital components in dealing with the Reston Ebola outbreak in 1989 in Reston, Virginia. The Hot Zone, a book by Richard Preston, was written based on details of the historical outbreak and the people involved.

Present day enrollment is 433 for the professional students in the DVM program. The academic year is divided in two semesters with no academic classes held during the summer months. Students enroll in 18 to 22 credit hours per semester and follow a comprehensive general veterinary medicine curriculum during the first three years. Rotations during the 4th year give students a more in-depth exposure to veterinary medical specialties. There are numerous graduate students in the College’s departments: Anatomy & Physiology, Clinical Sciences, Diagnostic Medicine and Pathobiology, and the interdisciplinary Master’s in Public Health.

Objectives
As the College of Veterinary Medicine entered the twenty-first century, the College’s administration envisioned graduating students who were not only comfortable with exploring new technology and its applications, but also proficient and confident in developing and using their technology skills. In order to fulfill this vision, it was recognized that students need to be placed in a position to succeed with technology in order to acquire confidence and to become comfortable in future situations.

Additionally the College chose to use this opportunity to influence the students to become lifelong learners. Technological advances have drastically changed one’s ability to explore and find necessary information and are especially critical in the medical fields. Veterinarians will need to continually access this information and technology and technological devices will be the avenue that gets them the information at the point of need. Success in this area supports the information literacy goals of the College.
Methods
During 2004 and 2005, the College administration began discussing the concept of a paperless curriculum in which lecture notes would be loaded onto a laptop computer for each veterinary student. The computer notes would replace the paper notes that students purchased each semester. Although the Computer and Technical Support (CaTS) staff supported the vision, it was determined that the technology available at the time was not yet adequate for this project. The technology was progressing at a rate in which this vision would soon be achievable; however, it would need to wait for a few years.

Discussions for funding this project were also held during this time. It was decided that the cost of the laptops, software, and other hardware should be distributed as a technology fee assessed each semester the student is enrolled at Kansas State University. Assessing a new fee required approval of the university’s governing board, the Board of Regents. To gain this approval, strict adherence to specific guidelines and a specific time table had to be met. In tandem with this, the project was able to move forward meeting the administrative requirements of the Board of Regents and allowing the technology to advance as needed.

The College developed the Kansas State University College of Veterinary Medicine Student Computing Initiative which states,

“The Kansas State University College of Veterinary Medicine believes that in order to maximize the learning experience and prepare for the medical, technological, and business challenges of the world they will be entering, our students must be proficient in the use of technology. As a result, the college implemented the Student Computing Initiative beginning fall of 2007.

Every 1st-year student enrolling at Kansas State University's College of Veterinary Medicine receives a new convertible laptop computer during their orientation week. These computers are the student's window to their education throughout the 4-year curriculum, providing access to electronic versions of all curricular materials made available via the CVM Intranet and/or K-State Online* (including text, images, audio, and video), as well as serving as a communications and collaboration tool between their fellow students and their professors.”

[*Note: K-State Online is an online course management system that was created, designed, and implemented by staff from the Office of Mediated Education at K-State.]

There are four primary components to the Student Computing Initiative.
- Uniformity – Each student receives hardware and software that is compatible with the hardware and software of their fellow veterinary students as well as their professors and the College’s infrastructure.
- Flexibility – Each laptop offers wireless access so the students can efficiently move throughout the Veterinary Medicine complex and other campus areas. This also allows the students to be more effective with anytime, anywhere access and gives them the ability to connect to needed local and university services.
• **Support** – The Computer and Technical Support staff became certified through the vendor and is able to troubleshoot situations and make on site repairs as needed. All laptops are covered by the manufacture’s warranty and replacement laptops are available in the event of catastrophic problems. Additionally hardware and software training is available in structured settings as well as in one-on-one settings.

• **Value and Convenience** – By providing a laptop that is configured with the necessary software for taking notes, backing up files, and protecting the laptop from viruses, the College provides a convenience to the students and/or parents. Additionally the group purchasing power is greater for acquiring the software and provides a lower cost to the individual student.

The Computer and Technical Support staff with consultation from College administration selected the Toshiba TabletPC Portege® M400. TabletPC models were selected for the ability of the user to “write” on the screen while taking notes, studying, or collaborating with fellow students. Also, this model was in production and available for testing prior to the semester that it was to be introduced.

In August 2007, the incoming first year class, Class of 2011, was the inaugural class for the Student Computing Initiative. An Orientation Week was held the week prior to classes beginning in the fall. First year students attend orientation to become familiar with the buildings, their lab and lecture hall, their fellow students, as well as the instructors. There is also structured time for the students to be in the teaching hospital allowing them time with 4th year students and clinicians.

In 2007 Orientation Week also provided the time needed for training on the tabletPC’s hardware and software. The training was scheduled on two days late in the week and the class was divided in four groups of 27 students each. The two hour sessions were held in a large conference room. The instruction was conducted by the Computer and Technical Support staff, for hardware and backup and antivirus software, and the instruction staff of Digital Instruction, Support, and Creative (DISC) Services. DISC Services instruction staff also provided training on Microsoft Office’s OneNote software which is the component that organizes the students’ class notes. In the fall semester, class notes are preloaded on each student’s tabletPCs. Additional notes are distributed throughout the semester by the instructors and downloaded by the students.

After consulting with the first year instructors, DISC Services instruction staff followed up the Orientation Week training by being present in the classroom during the first few days of the semester. The staff assisted those students who were worried about forgetting steps or material from the training. It aided the students’ confidence as well as provided support in a real-life setting.

Early communication with the class president was established in order to provide an avenue for information exchange. The class president was very conscientious about notifying DISC Services staff of problems or concerns the class encountered. Additionally the class selected two fellow first year veterinary students who possessed computer and technical backgrounds to serve as technology liaisons for the class. The Computer and Technical Support staff of the College reviewed the qualifications and knowledge of these two students and supported them in these
The student technology liaisons were able to present problems to the Computer and Technical Support staff and offer solutions during class or at other opportune times.

The Class of 2011 was surveyed twice in the academic year, once in October during the fall semester and then again in the spring. The fall survey questions (Appendix 1) addressed the activities of Orientation Week. The comments and group percentages were instrumental in the structure of Orientation Week for the next year. The spring survey questions (Appendix 2) elicited responses concerning the students’ abilities to study and use the tablePC and OneNote software. The responses from the spring survey are discussed in more specificity in the Results section of this paper.

The surveys were distributed via K-State Online. K-State Online allows the participant to remain anonymous. The completion of the surveys was entirely voluntary on the part of the students. The student could progress through the survey choosing whether to answer certain questions. No class time was allowed for the surveys and no points or grades were given for beginning or completing the surveys.

Using data and responses from the surveys completed by the Class of 2011 and concerns from the staff involved with the training, the structure of Orientation Week was revised. The Class of 2012, entering veterinary college in the fall of 2008, had their training sessions early in the week. The sessions were 4 hours in length and included a 35 minute orientation in the Veterinary Medical Library. This supplemented Orientation Week with an introduction to the library and kept the students from getting weary sitting in one area for a long length of time. The class was divided into two groups of 54 students in each section. A change was implemented where the training was held in the students’ lecture hall which is arranged with stadium/tiered seating. The location served a dual purpose. It allowed the training staff to maneuver between the rows of students more effectively and it allowed the students to begin learning in their lecture hall, becoming comfortable with the physical arrangement of the room in general.

Additional time was also incorporated later in the week for follow up training. On Wednesday and Thursday afternoons, city tours were available to the students. If they chose not to participate in this activity, the computer and instructional staff was available for further training or questions at that time. Orientation Week concluded in the early afternoon on Friday. Again the computer and instruction staff was available for walk in assistance the remainder of the afternoon.

The presence of the technology and instruction staff in the classroom in a real-life setting during the first few days of the semester was helpful the previous year and was repeated again in the fall 2008. The first year instructors continue to support this endeavor. The effectiveness of this training strategy will be evaluated each year and adapted as needed.

Also, the survey results indicated that information about the Student Computing Initiative needed to be disseminated to applicants as early as possible. Beginning with the second class, Class of 2012, the Computer and Technical Support (CaTS) and DISC Services staff were available during interview weekends to inform applicants about the Initiative. As well, a take home brochure was provided to the applicants and their families. These brochures were adapted and
mailed to the successful applicants with their contract in May. These opportunities to inform the applicants of the initiative and the hardware and software they will be using at K-State will need to continue for the next several years.

Results
Overall, the respondents from the inaugural class, Class of 2011, found the Toshiba TabletPCs and Microsoft’s OneNote beneficial to their success the first year at the College of Veterinary Medicine. Further data for the next few years will continue to shape the Student Computing Initiative.

<table>
<thead>
<tr>
<th></th>
<th>Class 2011</th>
<th>Class 2012</th>
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<tbody>
<tr>
<td>Class size</td>
<td>Spring = 112</td>
<td>Spring = Unknown at this time</td>
</tr>
<tr>
<td>Number of survey respondents</td>
<td>n = 59 (52.7%)</td>
<td>*</td>
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<tr>
<td>Ability to study effectively with tabletPC and OneNote</td>
<td>37.3%</td>
<td>*</td>
</tr>
<tr>
<td>Ability to efficiently take notes</td>
<td>49.2%</td>
<td>*</td>
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<tr>
<td>Ability to efficiently organize notes</td>
<td>72.9%</td>
<td>*</td>
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<tr>
<td>Ability to find information quickly with the search function</td>
<td>84.78%</td>
<td>*</td>
</tr>
<tr>
<td>Ability to pick up supplement information while in the classroom via the Internet, other class notes, etc.</td>
<td>50.5%</td>
<td>*</td>
</tr>
<tr>
<td>Unable to study effectively with the tabletPC and OneNote</td>
<td>30.5%</td>
<td>*</td>
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</tbody>
</table>

Many of the students adapted their note taking and study skills to the use of the Toshiba TabletPCs and Microsoft’s OneNote. The search feature of the OneNote software was noted as the function most used by the students. The students found the ability to search for terms across class notes to be extremely helpful when integrating the information from one class to another class.

Although successful with the introduction of the Initiative, 30.5% of the respondents reported they did not study as effectively with the tabletPC and OneNote. Speculations on the reasons for this dissatisfaction are taken from comments noted within the survey. A few students self-reported they suffered from eye strain or other eyesight problems, some of these problems leading to headaches. Some students were not ready to accept the technology for study purposes and preferred to study from traditional paper notes. Finally, the various and infrequent hardware
issues (freezing of the computer, keyboard and/or stylus not functioning) created studying concerns for those students who were affected.

The survey responses from the students indicated a need to inform the teaching faculty about the most efficient format for their lecture notes that are downloaded to the tabletPCs. When lecturing, many instructors use PowerPoint slides and, often these same slides are shared with the students as the notes for the class. The students discovered that darker backgrounds made reading their handwritten notes more difficult. The students prefer that notes they download have a light or white background. The darker backgrounds were still acceptable for the class lectures.

Additionally, the students requested that lecture notes be made available with sufficient time to download them prior to class. If lecture notes were posted too close to class time, the wireless infrastructure would become stressed with over 100 students attempting to download the same material. The format of the notes could vary between the actual PowerPoint slides the faculty would be using or the PDF of the PowerPoint slides. The students requested that both formats be available to them so personal preference could dictate the format they chose to download.

**Conclusion**

The Student Computing Initiative was successfully introduced into the College of Veterinary Medicine’s Class of 2011 and the paperless curriculum was well received by the students and faculty of the first year class. The collaborative effort of the computer support staff and DISC Services instructors can be recognized as leading the way for the success. Results from class surveys and feedback from students and instructors have helped shape the training and promotions on the initiative. Students will continue to be surveyed to gauge their attitudes and concerns as well as to determine if the objectives of the curricular transition are met. Continued support of the students who are open to and becoming proficient with the changes in technology they experience in the classroom and in their studying will be a high priority for the Computer and Technical Services (CaTS) staff and the instruction staff of the Digital Instruction, Support and Creative (DISC) Services. Determining the level of support and positive interaction needed for the students who are not as confident with the technology will also continue to be a priority for the CaTS and DISC Services staff.
Appendix 1

AXIO SURVEY

Feedback concerning Orientation Week

Survey Description
This survey is designed to provide feedback concerning the scheduling and activities during Orientation Week for the first year veterinary students.

Opening Instructions
Your feedback on Orientation Week is very important to us. It will allow us to provide further programs to you this academic year. It will also help make Orientation Week more beneficial to next year's class.

Page 1

Question 1
These first few questions will explore your opinion about the activities of Orientation Week. Please rank them on a scale of 1 to 3.

1 - Not beneficial | 2 - Beneficial | 3 - Very beneficial

| 1.1 Team building video activity | 1 | 2 | 3 |
| 1.2 Myer-Briggs Type Indicator (MBTI) discussions | 1 | 2 | 3 |
| 1.3 Scholarship discussion | 1 | 2 | 3 |
| 1.4 Professionalism/ethics discussion | 1 | 2 | 3 |
| 1.5 SCAVMA roundtables | 1 | 2 | 3 |
| 1.6 SCAVMA team building activities | 1 | 2 | 3 |
| 1.7 Mentoring lunch | 1 | 2 | 3 |
| 1.8 City/University tours | 1 | 2 | 3 |
| 1.9 Diagnostic laboratory orientation | 1 | 2 | 3 |
| 1.10 Clinic activities with 4th year students | 1 | 2 | 3 |
| 1.11 Tablet orientation and OneNote software training | 1 | 2 | 3 |

Question 2
What other activities would you like to see included for Orientation Week?

Characters Remaining: 1000
Question 3
Those questions pertain to the tablet training/OneNote software training that you received.

When did you receive your tablet?
☐ Wednesday  ☐ Thursday

Further comments about your response:

Question 4
In relationship to when you received your tablet, complete this sentence. I would rather have received my tablet
☐ Earlier in the week  ☐ This time was fine  ☐ Later in the week

Further comments about your response:

Question 5
Should the tablet (hardware) training be separate from the OneNote software training?
☐ Yes, please list in the comment box, how long each.
☐ No

Further comments about your response:

Question 6
Would it have been helpful to receive information regarding the tablet or OneNote before coming to campus?
☐ Yes  ☐ No

Further comments about your response:

Question 7
What type of information would you have liked to have received?

Characters Remaining: 1000

Question 8
When would you have preferred to receive this information?
Question 9
Do you have any words of advice for us to help next year's class?

Question 10
What is one (or more) things you wish we would have done differently or better?
Question 11

What is one (or more) things that was most helpful to you?

Question 12

Would you be interested in helping with next year’s training class?
☐ Yes  ☐ No

Closing Message
Thank you for taking the time to complete this survey. Your answers will be beneficial to us.

- End of Survey
AXIO SURVEY

1st Year Student Survey Concerning Paperless Curriculum and TabletPCs

Survey Description
As the inaugural class for the paperless curriculum initiative, you are in a position to provide valuable feedback to many groups in the College of Veterinary Medicine. We appreciate your time to complete this survey to better serve your class as well as future classes.

Opening Instructions
If you would like to comment on a particular question and there is not a comment section, there will be an area at the end of the survey for open discussion.

Page 1

Question 1
What do you consider the most effective uses of your tabletPC in the classroom?

Characters Remaining: 1000

Question 2
What challenges does your tabletPC present in the classroom?

Characters Remaining: 1000

Question 3
Do you feel the tabletPC and OneNote help you

<table>
<thead>
<tr>
<th>1 - Yes</th>
<th>2 - Sometimes</th>
<th>3 - No</th>
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<td></td>
<td>1 2 3</td>
<td></td>
</tr>
</tbody>
</table>

4.1 Study effectively
3.2 Take notes efficiently
3.3 Organize your notes efficiently
3.4 Find information quickly by using the search feature
3.5 Pick up supplemental information live in the classroom that broadened your understanding of a new topic

Question 4
Do you feel technology detracts from learning in the classroom, for example, too many Turning Point questions? If yes, you may explain below in the comments section.
- Yes
- Sometimes
- No

Further comments about your response:

Question 5
Do you think your instructors do a good job adopting their course material (or teaching methods) to the technology?
- Yes
- Sometimes
- No

Further comments about your response:

Question 5
What suggestions do you have to help us make your tabletPC learning experience better?
Question 7
At this time, do you have functions of the tablet/PC or OneNote that you would like to have additional instruction on? If so, please list the functions below.

Characters Remaining: 2000

Question 8
Please rank in 1-5 order the best time to offer an instructional class, with 1 being your highest preference. If you are not interested in a class, please only select #6.
-- Now - early evening (right after class)
-- Now - evening
-- Now - Weekend
-- Summer
-- Fall
-- I am not interested in a class.

Question 9
Do you know you can walk into DISC Services in the VM Library for immediate software help and/or to make a 1-on-1 appointment for instruction on any software?
☐ Yes
☐ No

Question 10
If you make hard copies of your notes, are you having difficulty in the notes formatting or printing in a desirable format?
☐ Yes
☐ No
☐ I don't print my notes.

Further comments about your response:

Question 11
Do you know that hard copies of your notes could be printed for $0.06/page by bringing the notes in on a flash drive or e-
Question 12

Like most computer manufacturers, Toshiba updates their product line every three years. The tabletPC model that replaces the M400 (your model) has just been released. Knowing that the new model has several new enhancements and features (see http://www.toshiba.com/pcs/portable/m700/m700-s7003), would you be interested in paying an extra one-time fee of $400-$500 to exchange your current tabletPC for a new one?

☐ Yes
☐ No

Further comments about your response:

Question 13

Additional comments may be entered below

Characters Remaining: 1500

Closing Message
Thank you for completing the survey. Your responses are of great interest to us.

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