

INTRODUCTION

While major urban medical and academic centers have access to medical simulation technology and training, many rural or medically underserved areas do not. Therefore, it is vital that ways are found to extend this technology into these areas. The Center of Excellence for Remote and Medically Under-Served Areas (CERMUSA) at Saint Francis University (SFU) has collaborated with the Peter M. Winter Institute for Simulation, Education and Research (WISER) at the University of Pittsburgh to train pre-hospital care providers in remote areas using medical simulation technology and distance learning methodology. WISER used its Advanced Prehospital Airway Management (APAM) course and in collaboration with CERMUSA, used distance education methodologies and technology to teach students approximately 70 miles away from the instructors base at WISER. We compared the results to previous traditional education at WISER.

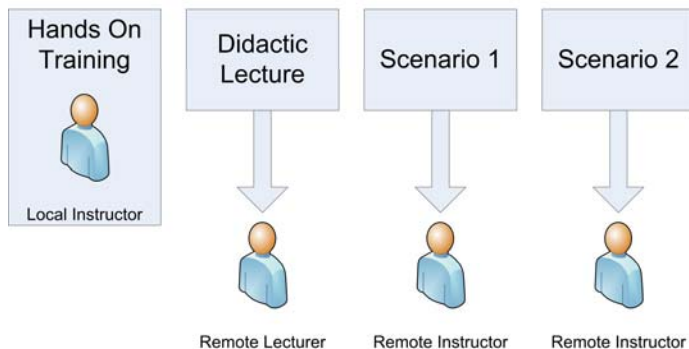
HYPOTHESIS

Using appropriate technology and techniques, remote instructors can effectively teach advanced airway skills.

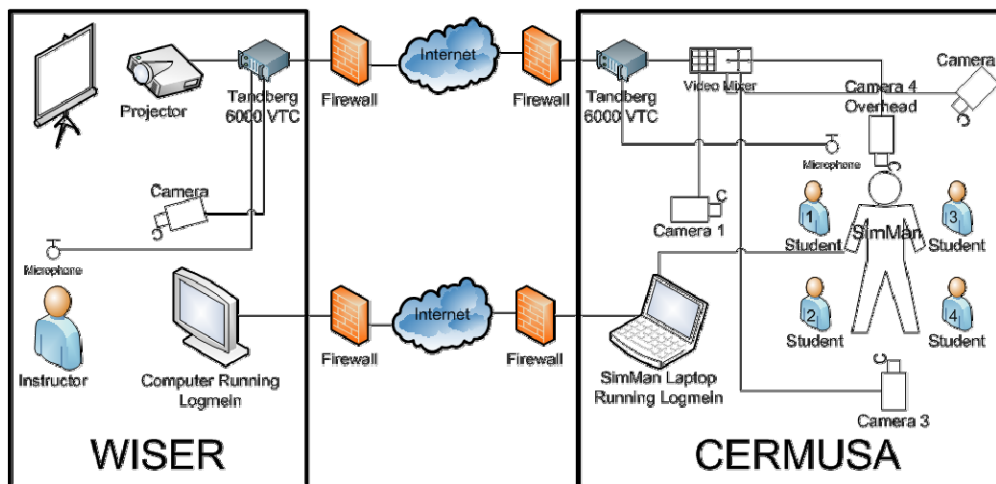
METHODS

The APAM course consists of pre-class web-based material, including PowerPoint presentations, instructional videos, and online surveys and quizzes. The classroom portion of the course consists of didactic lectures with opportunities for dialog with instructors and hands-on simulations with full-scale human simulators. Using a combination of video teleconferencing technology, remote computer management software, and distance education techniques a group of instructors located in Pittsburgh successfully taught students in Johnstown, PA (67 miles distant) and on the campus of SFU (77 miles distant). Students were rotated through four stations, including two scenario stations utilizing remotely controlled full-scale mannequins, a locally facilitated procedure station, and a remotely delivered interactive lecture. Students were trained and required to demonstrate competence in the two scenario stations in a variety of airway techniques which were facilitated by the instructors who had bidirectional audio and video, multiple camera angles, and full control and feedback of the mannequin. Students could see and interact with the instructors located in Pittsburgh. The locally facilitated procedure station allowed the instructor there to assist students with fine motor skill development, critical device placement and skills that did not lend themselves to distance education technology that is currently available. The interactive lecture allowed each party to see and interact with each other.

Class Setup



Students rotate through each of the 4 sessions



RESULTS

Post Course Evaluation Question	MSAD			All Classes			Delta Average
	N	Mean	Std. Dev.	N	Mean	Std. Dev.	
1. The objectives of the course were clearly stated.	10	8.00	1.56	432	8.26	1.37	-0.26
2. The course was appropriate for my level of learning.	9	7.78	1.64	431	8.15	1.48	-0.37
3. I plan to apply what I learned here to my practice.	10	8.00	1.94	425	8.53	1.43	-0.53
4. Overall course rating.	9	7.67	1.58	396	8.36	1.03	-0.70
5. The simulation scenarios were realistic.	10	7.90	1.52	417	7.81	1.37	0.09
6. The simulation scenarios were challenging.	10	7.80	1.55	432	7.69	1.53	0.11
7. I feel the simulations have improved my technical skills.	10	7.70	1.95	427	7.86	1.38	-0.16
8. I feel the simulations have improved my medical knowledge.	9	7.11	1.90	431	7.75	1.44	-0.64
9. I feel the simulations have improved my judgment skills.	9	7.44	1.67	429	7.80	1.43	-0.36
10. The scenarios were appropriate for my level of education.	9	7.78	1.92	431	8.07	1.38	-0.29
11. I found the simulation based training to be valuable.	10	8.00	1.63	428	8.20	1.33	-0.20
12. The web-based pre-course curriculum was helpful.	10	7.90	1.89	427	7.60	1.55	0.30
13. The web-based pre-course curriculum was well-organized.	10	7.70	2.21	431	7.79	1.47	-0.09
14. The web-based pre-course curriculum was easy to use.	10	8.80	2.57	431	7.71	1.67	-0.91
15. The web-based pre-course curriculum was helpful.	10	7.70	1.95	428	7.74	1.59	-0.04
16. The workshop web-based curriculum was well-organized.	9	7.33	1.80	427	7.89	1.38	-0.55
17. The workshop lecture was informative.	10	7.50	1.84	425	7.87	1.41	-0.37
18. The discussion of my performance was helpful.	10	7.90	1.60	432	8.03	1.29	-0.13
19. The debriefing session allowed me to see my mistakes.	10	7.80	1.62	431	8.11	1.31	-0.31
20. The debriefing session allowed me to learn from my mistakes.	10	7.40	1.78	432	8.13	1.30	-0.73
21. The debriefing was conducted in a professional manner.	10	7.80	1.32	429	8.26	1.29	-0.46
22. The WISER staff was supportive.	10	8.30	1.60	432	8.00	1.27	0.30
23. My orientation to the simulation environment was adequate.	10	7.90	1.66	432	7.00	1.29	0.90

Quiz Results	Pre Quiz			Post Quiz			Delta (Improvement)	
	N	Avg	Std Dev	Avg	Std Dev	Avg	Std Dev	
All Classes	432	62%	0.16	77%	0.14	15%	0.17	
MSAD	22	55%	0.17	69%	0.14	14%	0.18	
Difference		-7%		-8%		-1%		

CONCLUSIONS

While the MSAD student satisfaction scores and post assessment scores were slightly lower than in the traditional APAM class, students were very satisfied with the experience and improved on their assessment after instruction

We feel that this technology and methodology provides a good option for students and faculty that are separated by significant distance.

There are a number of issues that arose during the MSAD classes that required slight modifications from the traditional course. For example, since the instructor could not make eye contact or speak directly to the individual students, and could not recall their names easily, for later MSAD classes we had the students wear numbered vests so the remote instructor could call them by number as they were doing the simulation.

Both the students and the instructors needed to learn to speak loudly and clearly to be heard by the remote parties. Various microphone placements were tried for optimum sound capture. Omnidirectional conference microphones were eventually chosen. We attempted to have the student in the "hot seat" wear a small head mounted camera so the instructor could get a point of view image of what the student was seeing. This ended up being too distracting for the instructor and we eventually chose a static camera position over the bed.

This presentation will be available in PDF form via the WISER web site after the 2011 IMSH meeting at: