



Video Recording vs. Class Visits: A Comparison of Two Faculty Development Tools

Capt. Michael J. Richards, U.S. Air Force Academy

Michael J. Richards is an instructor in the department of engineering mechanics at the United States Air Force Academy. He directs a course in Statics and Strength of Materials. He received his MS in Nuclear Engineering from the Air Force Institute of Technology in Dayton Ohio and a BS in Mechanical Engineering from Brigham Young University in Provo Utah.

Dr. Daniel D. Jensen, U.S. Air Force Academy

Dr. Dan Jensen is a Professor of Engineering Mechanics at the U.S. Air Force Academy where he has been since 1997. He received his B.S. (Mechanical Engineering), M.S. (Applied Mechanics) and Ph.D. (Aerospace Engineering Science) from the University of Colorado at Boulder. He has worked for Texas Instruments, Lockheed Martin, NASA, University of the Pacific, Lawrence Berkeley National Lab and MSC Software Corp. His research includes design of Micro Air Vehicles, development of innovative design methodologies and enhancement of engineering education. Dr Jensen has authored approximately 100 papers and has been awarded over \$3 million of research grants.

Capt. Jason Daniel Christopher, USAFA/DFEM

Video Recording vs. Class Visits: A Comparison of Two Faculty Development Tools

Introduction

Teaching focused faculty development is critical to the success of a school.¹ A “learn as you go” approach to faculty development is costly in terms of the lower quality of education provided to students upon whom new faculty “practice”. For 95% of new faculty, it takes 4 to 5 years to become proficient teachers.² At our institution, we have found that this time can be significantly reduced through deliberate faculty development.

Many different techniques and methods have been described for faculty development. Felder, et al, point out that “...faculty development programs have become available on many campuses...” They also state, however, that “...many faculty members are still expected to learn how to do everything their job requires by trial and error.”³ Frequently, these faculty development programs are institution-wide and run by behavioral scientists. Many engineering faculty members find little value in participating in these school-wide programs because the examples, hypothetical situations, and information seem irrelevant. It has been demonstrated that discipline specific faculty development programs have certain advantages over school-wide programs.¹

As departments develop their own faculty development programs, leadership must decide what methods and tools to adopt. These decisions are best made with information regarding the benefits and (potential) detriments of each method and tool. This paper examines the benefits and detriments of using video recording of classroom teaching in faculty development and compares video recording to classroom visits from other faculty members.

Background

Continuing professional development is the furtherance of skills and knowledge in one’s profession. For the faculty member, professional development is often focused on maintaining expertise or currency in one’s field. The teaching faculty member, however, maintains more than one profession. In addition to their role as a technical expert, an engineer, for example, teaching faculty members are also professional educators. Faculty members today are expected to be both technical experts and, at least, proficient teachers.⁴ Developing proficiency in teaching can take substantial time, particularly when it is left completely to the faculty member.

Due to the nature of our school, we have frequent turnover of our faculty. The majority of the faculty members in our department have less than 5 years of formal teaching experience. This is common across the school. To make up for the shortfall associated with lack of longevity, the school runs a robust university-wide faculty development program, and each department is expected to maintain its own program in addition. True to form, many members of our department are not interested in the university-wide program, though most find value in the department led program.

In addition to other methods, such as student feedback, mentoring, practice lessons, small group discussions, etc., our department level faculty development program relies on a class visitation

program. In this program, faculty members visit one another's classes, record their observations, and then hold a face-to-face feedback session where the two faculty members discuss the observations. On average, faculty members visit 5 other classes per semester. The standard form that is used is included in Figure 1.

Faculty Visitation Feedback Form

Visitor _____

Instructor _____

Course / Date _____

I. **Quantitative Evaluation** (NOTE: the instructor will not see these numbers)

Enter a numeric evaluation (1-5) for each of the 4 categories below using the following scale

Score	Meaning
1	Significant problems
2	Mostly good – but some issues
3	Good – standard DFEM lesson
4	Great – provided good ideas to think about
5	Excellent – will definitely incorporate aspects into my classes

Category 1: Content – (is the breadth and depth of content appropriate & free of errors?)
Score (1-5) _____

Category 2: Delivery – (is the delivery well organized, engaging, motivating?)
Score (1-5) _____

Category 3: Innovation – (was there something innovative, creative or inspiring that increased learning or cadet motivation?)
Score (1-5) _____

Category 4: Standards – (is the classroom and military decorum to standards?)
Score (1-5) _____

Tear Line (separate the form along this line. Slip the top into the "ballot" box and provide the lower portion only to the instructor)

II. **Qualitative Evaluation** (NOTE: the instructor will see these comments)

Strengths:

Weaknesses:

Figure 1 Faculty Visitation Feedback Form

As can be seen on the feedback form, visitors rate their colleague in four areas: Content, Delivery, Innovation and Standards. They provide a score of 1-5 for each area in accordance with the rubric included on the feedback form. In addition to this quantitative rating, the visitor records both "strengths" and "weaknesses" on the lower portion of the form. Once the visit is complete, the form is separated along the dotted line (approximately 2/3 of the way down the paper). The top half of the form is given to someone who tabulates the numerical results which are used to determine faculty teaching awards. The bottom half of the form is used as a reminder to provide verbal feedback to the colleague whose class was visited. In our specific case, this visitation program is completely voluntary, but faculty members are only eligible for the teaching awards if they visit and provide feedback for at least 5 colleagues that semester. Also, this is not a primary method for supervisors to evaluate their people. Instead it is a collegial way to assist each other in becoming better teachers. We have been using this faculty visitation program for a number of years and it has been very well received by the department. We

normally have between 75% and 100% participation each semester. In an attempt to augment the development of our newest faculty members, we elected to introduce video recording of one of their classes as a new technique for our faculty development program. We hypothesized that this new technique would supplement the class visitation program by providing information and feedback that was different from the feedback received through the class visitation program. We felt that this approach was in keeping with the recommendation of Felder, et al, to ensure that faculty development programs address "...the needs and interests of the participants. For new faculty members, emphasize basic instructional issues and strategies."³ Additionally, we hoped that it would still be relevant to those who, as described by Fink, et al, are moving on from the first stage of faculty development where the focus is on the basics of teaching to the second stage where the focus is on the science of learning.⁴

Procedure for the Class Video Recording

Each of the new instructors in our department was invited to participate by being video recorded as they taught a class. It was made clear that participation was voluntary and that the videos would not be used for performance evaluation (awards, raises, promotions, etc.) to encourage participation. By request of some of the faculty members, it was also agreed that the videos would be turned over to the recorded faculty member and it would be their choice whether or not to allow others to view their video. Each instructor was allowed to select which lesson would be recorded.

Cameras were positioned in the classroom so as to limit their interference with the class. Two cameras were used for each section: a stationary camera that remained focused on the students, and a manned camera that remained focused on the teacher as he presented the lesson. The two video streams thus captured were processed by the on-site audio-visual team such that both images were synchronized and shown on single split display—like a television's "picture-in-picture" feature. DVDs of the videos were given to each instructor for their own personal review with an invitation to review the video with other faculty members and with the university's faculty development center.

After reviewing their video, each instructor was asked to complete a survey regarding their experience with the recording and what, if any, benefit watching themselves teach provided. Chism and Szabó have provided 3 levels of evaluation for faculty development programs. This survey addresses the first two of the levels: 1. The participants' satisfaction with the program and 2. The impact of the program on the participants' teaching. It does not address the third level, the impact on the participant's students.⁵ In the survey the participants were also asked to answer the same questions regarding the class visitation program. The survey consists of both Likert scale statements and open ended questions. See Figure 2.

<p>Likert Scale used for Questions 1-16 and 1-16. Respondents were required to select an integer value, 1-5.</p> <p style="text-align: center;">1 2 3 4 5</p> <p style="text-align: center;"> ----- ----- ----- ----- </p> <p style="text-align: center;">Strongly Disagree Disagree Neither agree nor disagree Agree Strongly agree</p> <p>First set of Likert Scale questions:</p> <p>Please rate whether you agree or disagree with the following statements pertaining to watching your video.</p> <ol style="list-style-type: none"> 1. I discovered several physical ticks that I would like to improve through watching the video. 2. I discovered a classroom technique that I should try based on watching the video. 3. I discovered a classroom technique that I intend to stop based on watching the video. 4. Based on what I saw in the video, students were more attentive in class than I anticipated. 5. Based on what I saw in the video, students were more distracted in class than I anticipated. 6. After watching the video, I will be more aware of my students' behaviors. 7. My video helped me realize how I could improve the logical flow of my lecture content. 8. My video helped me realize how I could improve the delivery of my lecture (energy level & speech: speed, volume, clarity). 9. My video confirmed that I do not have dialogue with my students as much as I intend to (I do most of the talking). 10. My video showed that I do not recognize and uncover my students' questions, misunderstandings, and misconceptions as much as I could. 11. The presence of a camera and filming crew distracted me from my lesson (e.g. you had to write in different spot, camera interrupted the board flow, you had to stand somewhere unusual, etc.) 12. I thought about the camera & film crew's presence a lot while they were in the classroom. 13. I changed my preparation for the lecture because I knew it would be recorded. 14. I learned additional ways to improve my teaching and classroom presence through watching my video that I did not learn through traditional classroom visits. 15. Watching my video was a helpful addition to existing teaching improvement strategies. 16. Watching my video caused me to reflect more on my approach to teaching that I would otherwise have done. <p>Open response question:</p> <ol style="list-style-type: none"> 17. What comments would you like to make concerning the classroom video recording? Please feel free to elaborate on any of your previous responses or to comment on something else not yet addressed concerning the classroom video recording. 	<p>Second set of Likert Scale questions:</p> <p>Please rate whether you agree or disagree with the following statements based on the traditional faculty classroom visitation program.</p> <ol style="list-style-type: none"> 1. I discovered several physical ticks that I would like to improve through the faculty visitation program. 2. I discovered a classroom technique that I should try based on the faculty visitation program. 3. I discovered a classroom technique that I intend to stop based on the faculty visitation program. 4. Based on what I learned from the faculty visitation program, students were more attentive in class than I anticipated. 5. Based on what I learned from the faculty visitation program, students were more distracted in class than I anticipated. 6. Based on what I learned from the faculty visitation program, I will be more aware of my students' behaviors. 7. The faculty visitation program helped me realize how I could improve the logical flow of my lecture content. 8. The faculty visitation program helped me realize how I could improve the delivery of my lecture (energy level & speech: speed, volume, clarity). 9. The faculty visitation program confirmed that I do not have dialogue with my students as much as I intend to (I do most of the talking). 10. The faculty visitation program showed that I do not recognize and uncover my students' questions, misunderstandings, and misconceptions as much as I could. 11. The presence of another faculty member distracted me from my lesson (e.g. you had to write in different spot, camera interrupted the board flow, you had to stand somewhere unusual, etc.). 12. I thought about the presence of the other faculty member a lot while he/she was in the classroom. 13. I changed my preparation for the lecture because I knew it would have a visitor. 14. I learned additional ways to improve my teaching and classroom presence through traditional classroom visits that I did not learn through watching my video. 15. The faculty visitation program was a helpful addition to existing teaching improvement strategies. 16. The faculty visitation program caused me to reflect more on my approach to teaching that I would otherwise have done. <p>Open response question:</p> <ol style="list-style-type: none"> 17. What comments would you like to make concerning the traditional classroom visitation program? Please feel free to elaborate on any of your previous responses or to comment on something else not yet addressed.
---	---

Figure 2 Post video recording survey. The left hand side asks about the video. The right hand side asks about the faculty visitation program.

Results and Discussion

6 instructors volunteered to be recorded. Of these 6, 3 were teaching their first semester, 2 their fourth, and 1 his 13th semester. The participants came from 3 different departments (Engineering Mechanics, Civil and Environmental Engineering, and Astronautical Engineering), though they were all teaching the same course (an introductory Fundamentals of Engineering Mechanics course) for the recording.

A summary of the numerical results from the survey is provided in Figure 3. Each bar represents the average value of the participants' responses to the survey questions. Higher numbers represent greater agreement with the statement made in the survey.

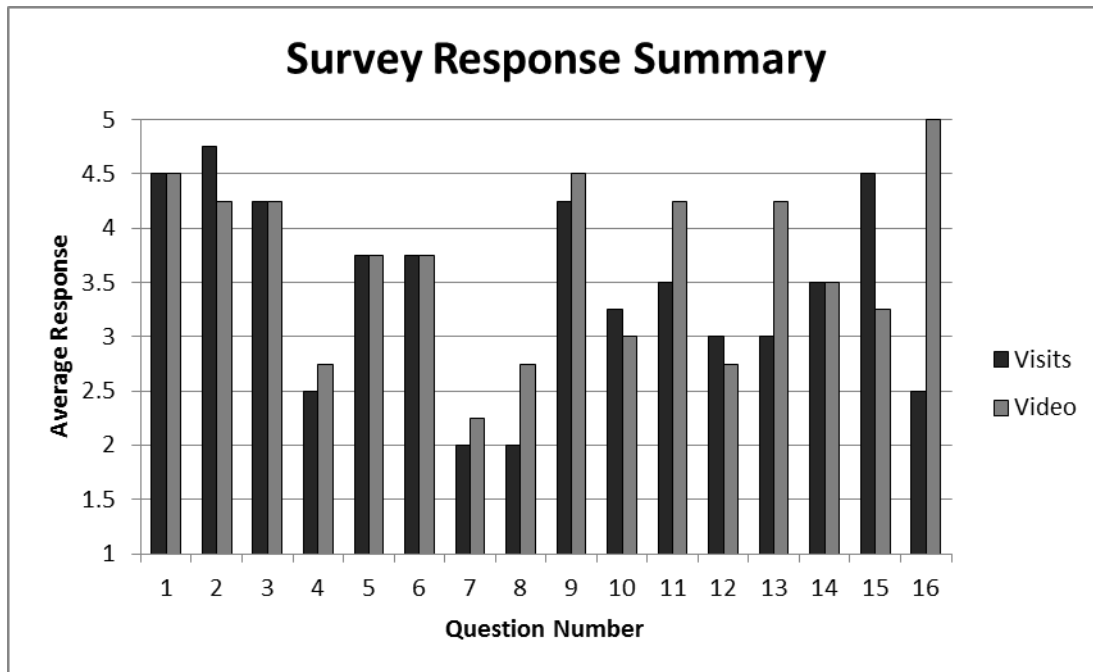


Figure 3 Survey Response Summary showing the average response to each of the 16 questions in the survey.

While most of the questions received approximately the same score, less than 0.5 difference in the averages of the video and the visit, for a few of the questions, the difference was greater. These include questions 2, 8, 11, 13, 15, and 16.

Questions 15, *“I discovered a classroom technique that I should try based on watching the video/the faculty visitation program,”* and 2, *“Watching my video/the faculty visitation program was a helpful addition to existing teaching improvement strategies,”* are the only questions where the average participant response for the faculty visitation program was more than 0.5 greater than the response for the video. For both of these questions, the participants “agreed” or “strongly agreed” with these statements. The response for question 15 is as one would expect. While visiting other classes, new instructors see different techniques and are exposed to a wide range of styles and methods. Additionally, when the new instructor’s class is visited, the visiting faculty member might make suggestions about different techniques to use. The response for question 2 suggests that the new instructors felt that, over all, the faculty visitation program was slightly more helpful to them than was the video.

Questions 8, 11, 13, and 16 each had an average participant response for the video that was more than 0.5 greater than the response for the faculty visitation program. Each of these questions will be reviewed and discussed in turn.

Question 8: *“The faculty visitation program/watching the video confirmed that I do not have dialogue with my students as much as I intend to (I do most of the talking).”* The average answers to this question fell between “disagree” and “neither agree nor disagree”. It seems that the video provides an opportunity to evaluate the amount of time the participant spent talking. The response, close to “neither agree nor disagree” seems to suggest that the participants did not

feel they talked too much after watching the video, but were left uncertain by the faculty visitation program, as indicated by “disagree” response.

Question 11: *“Based on what I learned from the faculty visitation program/what I saw in the video, I will be more aware of my students’ behaviors.”* This question was answered with agreement for both the faculty visitation program and for watching the video, though watching the video showed stronger agreement. A visiting faculty member’s attention is often more focused on the teacher than on the students. While it is not uncommon during the post-visit discussion for the students’ behavior to be brought up, most of the discussion focuses on what the teacher did and said. The video provides the opportunity to pay attention to both the teacher and the students by allowing the viewer to review the same time period as often as needed.

Question 13: *“Based on what I learned from the faculty visitation program/what I saw in the video, students were more attentive in class than I anticipated.”* For watching the video, this question was answered, on average, between “agree” and “strongly agree”, while for the faculty visitation program, it was answered, on average, as “neither agree nor disagree.” This response suggests that where the faculty visitation program does nothing to change the teacher’s expectations of the students’ focus, actually watching the students from another perspective (that of the video camera) allowed the teacher to see how much the students were actually paying attention.

Question 16: *“I discovered several physical ticks that I would like to improve through the faculty visitation program/watching the video.”* The participants universally strongly agreed with this statement for watching the video, and, on average, neither agreed nor disagreed with it regarding the faculty visitation program. This comes as no surprise. Except in cases where the “tick” is severely distracting, visiting faculty members are unlikely to bring up mannerisms. However, the participants observed that they were much more likely to notice “ticks” that they were previously unaware of.

In addition, the following statements made by the participants are relevant:

“...The faculty visitation program is helpful because it provides someone else's perspective on my teaching. If someone else reviewed the video, it could potentially also provide this benefit (instead of being solely focused on my own interpretation of what I see in the video).”

“...The visits are valuable because they bring up things I never would have thought of. Additionally, the faculty that visit often have suggestions on ways to better teach a topic. The videos themselves, can't make suggestions--and don't have any experience teaching the material I now teach.... I wish I had watched this with someone else.”

“There are a few things that I observed during the video that I either thought to be the case, but hadn't been able to observe as an "outsider" or was surprised by. First, the students pay more attention to video clips, demonstrations and the other [students] than they do to me talking or writing things on the board.”

“[In the video, I saw that] ...it often occurred that, after asking a question, I turned my back on the student answering in order to write on the board, even though I continued to listen to them. I

think in the future I will keep my attention on the answering student until they have finished talking.”

“After completing this survey, it makes me want to watch the video with someone else. I can see that the conversation with the other faculty member [after they visit the class] brings up things that I would never think about.”

“A real benefit of the video is that I could stop and go back to watch certain portions, take time to think about what I had said and if that's how I'll say it next time, and I can rewatch how the students react to things that say and do.”

“I became very aware of my pacing. I thought I always moved too slow, but I actually move way too fast in class. I did not see that until I looked at the video.”

“I noticed that some students were more distracted than I thought, but others were really into the material. I'm not sure how much the camera influenced their behavior (asking questions, speaking up, etc.).”

Conclusion and Recommendations

A number of conclusions can be drawn from these results, the first of which is that it appears both the video and the faculty visitation program are beneficial in the eyes of the participants. For the majority of the questions on the survey, the average response for the video recording was not substantially different from the average response for the faculty visitation program. The participants' comments also identify benefits that each program provides. A second conclusion is that both the faculty visitation program and the video recording seem to have certain strengths. This conclusion is born out in the questions where there was a large difference in the responses as well as through the participants' comments.

McKenna, et al, describe the benefits to teaching provided by collaborative reflection.⁶ Each of our participating instructors was invited to review their video with the school's faculty development center, though none took the opportunity. As was seen in the comments, some of the participants recognized this missed opportunity and regretted not having taken it. Perhaps a method to motivate this additional step can be developed and implemented in a future iteration of this work. It is reasonable to suspect that some of the strengths of the faculty visitation program could also become strengths for the video recording program with the addition of other faculty members watching a teacher's video.

Studies have shown that student-centered teaching yields students who adopt deeper approaches to learning.⁷ Unfortunately, as McKenna, et al, observe, “...one may have high intentions to teach in a student-focused way that emphasizes conceptual change but employ more knowledge transmission teaching strategies.”⁶ Even more relevant to our situation however, as Svinicki and McKeachie point out, is that new instructors are much more concerned with getting through their first few lessons without too much difficulty than they are with the philosophy of education and theory of learning.⁸ Video recording, as part of a faculty development, can help address both of these issues and be applicable to many levels of instructors by allowing the instructor to see his teaching from the student's perspective.

While by itself, as a single experience, having a lesson recorded and then reviewing that record is unlikely to make a significant change in an instructor's approach to teaching, incorporating it into a broader faculty development program could certainly contribute to the consistent engagement Bowden described as necessary to bring about significant change.⁹ Watching one's self teach leads to active reflection, and while not the in-depth reflection described by McKenna, et al, who included publishing papers as part of in-depth reflection, we can certainly expect, through sustained engagement, some of the benefits they describe.⁶

To those who are considering making use of video recording in faculty development, we make the following recommendations:

1. Disconnect the video from performance evaluations to ensure high participation and lower stress during the recording.
2. Place emphasis on the value of reviewing the video with other faculty members/learning professionals.
3. Use dual-image (one on the teacher, one of the students) recordings, as they provided a large portion of the insight gained through videos.

Acknowledgements

This material is based on research sponsored by the United States Air Force Academy under agreement number FA7000-12-2-2005. The US Government is authorized to reproduce and distribute reprints for Government purposes notwithstanding any copyright notation thereon.

The views and conclusions contained herein are those of the authors and should not be interpreted as necessarily representing the official policies or endorsements, either expressed or implied, of the United States Air Force Academy or the US government.

Bibliography

1. Adams, R.S., and Felder, R.M. (2008). Reframing Professional Development: A systems approach to preparing engineering educators to educate tomorrow's engineers. *Journal of Engineering Education*, 97(3), 239–240.
2. Boice, R. (2000). *Advice for New Faculty Members: Nihil Nimus*. Boston: Allyn and Bacon.
3. Felder, R.M., Brent, R., and Prince, M. J. (2011) Engineering instructional Development: Programs, Best Practices, and Recommendations. *Journal of Engineering Education*, 100(1), 89-122.
4. Fink, D.L., Ambrose, S. and Wheeler, D. (2005). Becoming a professional engineering educator: A new role for a new era. *Journal of Engineering Education*, 94(1), 185–194.

5. Chism, N.V.N., and Szabó, B.S. (1997). How faculty development programs evaluate their services. *Journal of Staff, Program, and Organization Development*, 15(2), 55–62.
6. McKenna, A.F., Yalvac, B., Light, G. J. (2009) The Role of Collaborative Reflection on Shaping Engineering Faculty Teaching Approaches. *Journal of Engineering Education*, 94, 17-26.
7. Trigwell, K., M. Prosser, and F. Waterhouse. (1999). Relations between teachers' approaches to teaching and students' approaches to learning. *Higher Education* 37 (1): 57–70.
8. Svinicki, M., and McKeachie, W.J. (2011). *McKeachie's Teaching Tips: Strategies, Research, and Theory for College and University Teachers*, 13th ed. Florence, KY: Cengage Learning
9. Bowden, J.A. (1988). Achieving change in teaching practices. In *Improving learning: New perspectives*, ed. P. Ramsden. London: Kogan Page.