

FACULTY PERCEPTIONS OF VIDEO CONFERENCING TECHNOLOGY

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ABSTRACT

Video conferencing is a collection of technologies used to extend course offerings and synchronous learning opportunities across multiple campuses. To reduce costs and student commute time, video conferencing was recently introduced at a public institution of higher education in the Southeastern United States consisting of five campuses spread over a 150 mile geographic region. This paper outlines faculty perceptions of video conferencing technology after two semesters and provides insights that may be beneficial to other institutions.

Keywords: Video Conferencing, Higher Education, Teaching Innovation

INTRODUCTION

In 2012, the public university system of a large southeastern state in the United States voted to consolidate eight of its existing institutions into four new institutions of higher learning. The consolidations brought with them many opportunities and challenges. In particular, one of the new institutions found itself confronted with how to deliver instruction across five campuses spread across a 150 mile geographic region of the state. The administration of the institution chose in part to investigate and invest in the use of videoconferencing as a means to extend its offerings across the campuses.

The use of videoconferencing to extend course offerings and opportunities across multiple campuses is not a new idea and it has been shown to provide benefits for the institution, instructors, and students (Hoyt, Howell, Lindeman, & Smith, 2013; Fox, McDonough, McConatha, & Marlowe, 2011). The newly consolidated institution (NCI) in this study began offering courses under its new name in the spring semester of 2013. During the following year, the existing network and videoconferencing infrastructure was evaluated, upgraded, and additional videoconferencing technologies were put into place which would allow for a pilot of six video conferencing courses to be delivered in the spring semester of 2014.

For the six pilot courses, which consisted of 15 different sections taught on four different campuses to a total of 167 students, the institution utilized five different classrooms with varying videoconferencing technologies (both new and existing from pre-consolidation). While one course withdrew from the pilot before mid-semester, the others successfully completed the pilot and the decision to expand the number of classrooms and courses offered via videoconferencing was made.

Over the course of the next academic year (2014 – 2015), NCI's videoconferencing of courses expanded to include the addition of six additional classrooms outfitted with varying videoconferencing technologies across all five campuses and more sections being offered to students. The institution had in place two classrooms on its main campus that had existing Cisco/Tandberg videoconferencing codecs and cameras. The institution also had a Cisco TelePresence Multipoint Control Unit (MCU) in place to handle prior videoconferencing needs. Additional state funding allowed the addition of three additional classrooms utilizing Cisco cameras and codes on two of NCI's campuses. As the state funds began to dwindle, Polycom units were installed in four additional classrooms across three campuses as Polycom units were more cost effective at the time. The final additional classrooms were outfitted with Lifesize cameras and codecs which not only were less expensive than the Polycom units and included the ability to utilize the existing MCU for connectivity, but also could take advantage of Lifesize cloud connectivity.

The peak of the course offerings occurred in the 2015 – 2016 academic year with 26 courses being offered in the fall semester and 31 courses offered in the spring across all five campuses of NCI. It was at this point that it was decided by the authors to conduct a study of the perceptions of the faculty who were assigned to teach courses via this method. The research sought to answer the following question: What are the perceptions of faculty assigned to teach courses taught via videoconferencing at NCI?

Theoretical Framework

Industries continue to struggle to keep up with new and emerging trends in technology. Those organizations taking advantage of technology and investing in technology continue to thrive while others may wither into obscurity in our ever-increasing digital world (Mithas & Rust, 2016). As technology has proliferated, better technologies and new markets have opened using internet technologies that have effectively eliminated physical distances between those wishing to share information and goods. Whether synchronous or asynchronous, users can share information in a variety of ways like text, chat, audio, video and other forms of communication easier than before. As these technologies evolve; newer and better methods of communication are created; thus repeating the cycle of new trends in technology (Grodal, Gotsopoulos, & Suarez, 2015).

Higher education stands as a precipice to many industries; tasked with preserving, procuring, and disseminating knowledge to many students across many disciplines. Technology's role in the classroom is ever-changing but the fact that technology is present is here to stay. Many educators are familiar with using video (Hedderly & Scott, 2015) in the classroom but, as technology evolves, educators are have been provided with many tools like Facetime, Skype, and other solutions that provide real-time video interactions with students over geographical distances. Difficulties continue to exist (Hoyt, Howell, Lindeman, & Smith, 2013) but with the foresight of evolving trends, those that use synchronous video interactions in education stand to be shape the ways these trends evolve and provide better learning environments (Grodal, Gotsopoulos, & Suarez, 2015).

Budget cuts in higher education have forced educators to find new and innovative ways to increase enrollment (Taylor, Nichol, & Dziuban, 2011). As technology has paved the way for cheaper devices, faster internet speeds, and more interconnectivity between students and educators; the atmosphere is ripe for solutions that can provide more services with less resources. Video conferencing is a course delivery model that isn't new to higher education but continues having a hard time being defined. A variety of devices, disciplines, configurations, vendors, and vendor-specific technical jargon make it hard for institutions to objectively evaluate video conferencing at their own institution and almost laughable when comparing video conferencing abilities with another institution. Educators have a plethora of methods (Locatis, et al., 2006) and technology (Richardson, Fox, & Lehman, 2012) to choose from and often choosing the right solution is not a straight-forward answer.

Institutions stand greatly to benefit from implementations of video conferencing (Hoyt, Howell, Lindeman, & Smith, 2013). More courses can be offered in more locations at the same time; allowing the ability for more seats to be filled and thereby increasing credit hour production. More filled seats and greater campus resource utilization help pave the way for more increases in funding. With only one instructor filling multiple locations, the institution also does not have to hire additional faculty to cover the additional workload. Startup costs in today's market are almost negligible with the proliferation of cheap and fungible devices and software which lowers the barrier into utilizing video conferencing from an institutional perspective (Zalud, 2015). Indeed, should the institution's infrastructure be capable of supporting it, it should encouraged as a course delivery model.

While it might seem straight-forward that institutions pursue video conferencing there are important concepts like the 'doomsday scenario', in which a class the technology is not working (Fox, McDonough, McConatha, & Marlowe, 2011), that has to be accounted for each and every class period. Program success as a whole is reliant on a combination of mitigating factors combining together correctly to make learning a success. Small discrepancies, such as the volume being too high or too low can negatively impact the entire learning experience. It is in the institution's best interest to make sure any and all resources are available to those utilizing video conferencing including, but not limited to, training, support, and appropriate infrastructure (Locatis, et al, 2015).

Like many other institutions, we define video conferencing as an alternative to traditional face-to-face interaction in which students on multiple locations can participate in the same class synchronously (Richardson, Fox, & Lehman, 2012). Similar to other educators using video conferencing for instruction; we experience the full gamut of problems. Mostly when problems with the technology arise but not exclusive to things to things like students experiencing ‘disconnect’ at the remote locations. Training on the use of technology is provided however instructors are allowed to design their course as they see fit.

RESEARCH METHODOLOGY

The participants of the study were faculty at the author’s university who agreed to pilot the video conferencing teaching environment. A total of 45 faculty were asked to participate and six academic units were represented, including the School of Information Technology, School of Business, Department of Media, Culture and the Arts, Department of English, Department of Psychology, Sociology, and Criminal Justice, and the Department of History and Political Science.

To assess faculty perceptions of video conferencing, an online questionnaire that was developed based on faculty interviews conducted by the Institutional Research Department at the University of South Florida Sarasota-Manatee, was used (University of South Florida Institutional Research, 2008). The survey consists of 21 questions. Questions 1, 2, 4, 5, and 8 used nominal scales while the remaining questions were open ended.

The survey was administered via Survey Monkey and made available to faculty who were assigned to teach video conferencing courses during the fall 2015 and spring 2016 semesters. Faculty submitted their responses anonymously. A total of 33 faculty responded to the survey.

SPSS was used to calculate statistical frequencies for the nominal data and the open-ended responses collected were imported into qualitative analysis software (NVivo). The data for each open-ended question were coded both automatically by the software as well as manually by the researchers. Using both the automatic and manual process of coding qualitative data has been shown to provide greater validity and reliability than solely relying on one approach (Welsh, 2002). The codes assigned were either by sentiment or emergent themes in the responses based upon the question.

RESULTS

In terms of experience teaching a class via videoconferencing, the respondents show that they were overwhelming new at this delivery method. Fourteen reported having only taught one class, fourteen having taught two, and only five had taught more than two classes via videoconferencing. This is to be expected as this delivery method is still somewhat in its infancy at the institution.

Support and Training

The faculty were first asked about their perceptions of support and training in teaching via videoconferencing. 72.7% (f.24) of the participants indicated that they felt they received adequate support, 90.9% (f. 30) participated in the training offered before they began teaching, and 78.8% (f.26) indicated that they felt they received adequate training.

The faculty were also asked to provide additional input on ways to improve both the support and training received. In terms of support, the themes identified in the responses related to the faculty feeling that while there was “good support”, issues related to equipment problems were prevalent. As one faculty member put it, “the problem is we have good people support. But the technology is not cooperating. For example, either video, audio, or browser links are not working while teaching the classes.” Another faculty member stated that “the support personnel spent more than enough time in my classroom, during class time, but the technology consistently had issues that just took 10 to 30 minutes to fix several sessions.” Themes related to the need for evening support, support materials, and additional training were also identified. Additional training themes also indicated a need for written instructions available in the classroom as well as the need for training related to student engagement strategies, individualized

training sessions, and the need for more practice before the class begins. Changes in protocol for using the equipment also was identified as an issue, with one faculty member noting that “while the initial training session was helpful, the way the system operated was changed by the first day of classes”.

Table 1. Frequency Distributions

	Frequency (f)	Percent
Q2 Received adequate technical support	24	72.7
Q5 Received adequate training	26	78.8
Q4 Attended training sessions	30	90.9
Q8 Resistance from students	26	78.8

Areas for Improvement

The faculty were next asked if there were any aspects of the technology, such as the video or audio, that they have identified as needing improvement. Overwhelmingly, issues related to audio quality was a prevalent theme. One faculty member noted that “Yes, the audio portion needs tremendous work. Students at the remote site have a very difficult time hearing the instructor and the microphones are so sensitive that it picks up every movement of paper that is made from the hosting site. This is very distracting for the students. Several times the audio has been an issue and I've had to dismiss the students at the remote site because they were unable to understand what I was saying.”

While audio issues seemed to be the greatest concern, other prominent themes in the data included the placement of cameras, the reliability of the technology, and general problems showing video content across the system while videoconferencing. A theme related to the differing technologies in the classrooms was also identified. One participant noted that “some classrooms have better technology than others” adding that “the rooms need to have equal picture and sound quality on all campuses”. Another noted that “the variation in equipment from room to room is sometimes a little confusing”.

Student Resistance

The survey next asked if the faculty felt resistance from the students. 78.8% (f.26) of the respondents responded that yes, they indeed felt resistance from the students, yet it is interesting to note that the faculty responding in the fall survey felt a great resistance with 88% responding yes, while in the spring survey results that number went down to 63%. When asked if this resistance was from the students taking the class from the delivery or remote location, 83% responded that it was primarily from the remote site students, while 17% of the participants felt it was shown at both sites.

It was noted in several open-ended responses that the resistance may not be solely because of the technology, but because of the students themselves. As one faculty member stated, “students would come to class totally unprepared. They would not read the material before class; therefore they could not effectively participate in class discussion.” Another felt that the instructor’s physical presence in the classroom made a difference and added that “whichever

location I am physically at, everything is fine. It is the remote location where I am not physically there that completely checks out. This has nothing to do with technology but with the attention span of students.” Instructor physical presence was also shown as having a big impact from one faculty member who stated that “I travel between both locations, but students like me to be in person, rather than on the TV.”

Student Benefits and Performance

When asked if there were any added benefits to students using videoconferencing, 57% of the responses indicated that the faculty felt that the major benefit was that it allowed the students to take the class on a campus closer to their home and eliminated the need for travel. They also indicated that the students would have access to classes they may not have had without the added benefit of videoconferencing. As noted by one faculty member, it enabled the students “to take classes that aren't offered on their campus regularly or at all due to lack of faculty availability”.

The faculty’s perception of student performance on tests, work assignments and/or class participation revealed that 42% of responses felt the student’s performance was comparable while 58% felt it was not. While responses indicated that it was believed that the remote site suffered the most, the student participation factor was noted, even in cases when the student’s grades were comparable. One participant reported that the “tests and assignments are comparable but participation is more difficult” while another added that “final grades were comparable, although class participation was, as noted above, almost non-existent”. The remote site was not always identified as the poorest performing site by the participants however. As reported by one more experienced faculty member, “I'm currently teaching my third v-c class. In two of them, the students' performance at the remote site was inferior. In one of them, the performance at the remote site was better”. One factor related to performance harkened back to the “physical presence” theme noted earlier. As one faculty member noted:

This is a round-about way of saying that, without an official presence in the classroom, the dynamics can easily change. I saw students who felt more enabled to be inappropriately casual, to "check out," to exit the room while class was in session, to come in late. While of course such problems can exist in face-to-face classes, the physical presence of a faculty member diminishes them -- or allows the faculty member to better gauge the problem. Is it one person in the corner not paying attention? Or is it the whole class? Is the person leaving looking sick? Or are they taking a personal moment? I could never tell, and with 3 classrooms to monitor and a class to conduct, couldn't deal with such fine points (especially when I had little sense of the climate in the remote classroom).

The data reported in the next five questions of the survey were analyzed and coded based on the sentiment indicated in the individual responses as either being very negative, moderately negative, neutral, moderately positive, or very positive.

Table 2. Faculty Sentiments

Question	Very Negative	Moderately Negative	Neutral	Moderately Positive	Very Positive
Q12 Overall, what do you feel students’ reactions were to the video conferencing of the course?	15	5	4	6	3
Q13 What was your overall comfort level with various technologies, not just video conferencing, before teaching via this method?	2	3	0	8	18
Q14 What is your overall comfort level now after implementing the video conferencing technology?	2	2	5	14	9
Q15 What did you like the most about video conferencing your course?	10	2	0	7	11
Q16 How many additional hours of preparation were needed, weekly and before the start of the course?	6	13	0	12	0

These data show that while faculty felt comfortable with various technologies before and after implementing videoconferencing, they felt overwhelming negative about the students’ reactions to taking their course. While negative responses included that they felt the students “hate it” and that “it's a pain, it's clunky, and it doesn't deliver the same level of high quality instruction that students get when they are all in the same room as the instructor”,

there were glimmers of positive perceptions with one faculty member noting that there was “resistant at first but I think it has become pretty normal” and with another faculty member echoing that sentiment by stating that it was “negative at first, but as the technology improves and the initial getting used to something new sets in, students are becoming more receptive to it”.

The sentiment data also show that while faculty felt overwhelmingly negative about the additional hours of preparation needed to teach in this manner, they did have some positive feelings about teaching their courses via videoconferencing. One faculty member stated they found it rewarding “learning something new and being a part of pioneering new technology.” Another noted that they enjoyed “being able to teach on two campuses at once” with others noting the flexibility it provides students and that “it enables us to serve multiple campuses and make a class that might otherwise be too small to make run”.

Faculty Challenges and Barriers

When questioned about any perceived challenges or barriers to teaching via videoconferencing, the overwhelming emergent theme was related to general technical problems, primarily technical “glitches” and the equipment not working at times. Problems related to audio transmission were listed as the main technical concern, with problems playing videos via the videoconferencing system another. The ability to engage the students at the remote site was also a dominant theme found in the data, as were issues related to testing and the proctoring of exams. Only one respondent noted that there were no challenges or barriers during their experience teaching via videoconferencing.

Faculty were next asked if there was anything they would change about the way in which they organized the course to incorporate the videoconferencing aspect. The major theme in the data showed that the faculty would change their teaching methods, moving primarily to a lecture-focused format, even if they may be reluctant to do so. As one participant noted, “the only change I can imagine making would be to lecture and avoid student discussion, but that would not help students learn deeply” and another stated “I would rather just not have the videoconferencing. Perhaps it works well for lecture-oriented courses?” Others noted they would also change the frequency of teaching from the remote site, with one faculty member stating that “last semester, I felt that I barely knew my students”.

Faculty Suggestions

When asked about suggestions they would give to other faculty considering teaching via videoconferencing, the primary theme found in the data was related to being familiar with the technology. Utilizing tech support was the next most dominant theme for this question. Getting feedback from and engaging the remote students was also identified as a suggestion, as were having a backup plan when problems occur, visiting the remote site(s) often, the need for patience and being prepared. Faculty were also asked to give suggestions to administrators who may assign faculty to teach via videoconferencing. The dominant theme that emerged from this question was the need to devote more resources to this endeavor, including additional student workers to assist the faculty, additional training opportunities, and ensuring equality of the classroom technology. Several respondents wanted administrators to consider workload issues related to teaching via videoconferencing. As one respondent noted:

Maybe also consider reducing course load for instructors who use this method, especially if these surveys reveal what I think they'll reveal, which is that instructors require additional preparation time for these courses and that the courses themselves are more demanding than courses in traditional environments.

The last question of the survey asked the faculty if there was anything else they would like to add about teaching via videoconferencing. While many of the same themes emerged as from the data in previous questions (i.e. need for resources, tech support, student engagement) there were also responses that indicated there is hope for teaching in this manner. One faculty member stated that “I like that (NCI) is pursuing these concepts. It gives flexibility to students and allows us to get more students on-campus and interacting w/ peers”. While another faculty member somewhat echoed those sentiments, their response was a bit more pragmatic stating that “I am grateful that this technology enables us to reach students and to make our dollars stretch. But let's remember that it is a stop-gap. One group of students is probably always going to have a better experience than the other”.

CONCLUSION

The purpose of this study was to ascertain faculty perceptions of video conferencing technology as a means of providing synchronous instruction across multiple campuses. Our results support our research that video conferencing instruction has the potential to reach a larger group of students, geographically separated, and be a net benefit to the institution. However, many challenges with this instructional approach remain, namely that the diversity of hardware, pedagogy, and instructors make it hard to compare one video conferencing course to another.

While a majority of faculty indicated that they received adequate training and technical support, one of the most cited issues with video conferencing was with the technology itself. A video conferencing course relies on audio, video, and internet connectivity to work correctly. An issue with any of these technologies can have a significant impact on the course delivery. More robust testing and consistency in the technology across all locations is crucial for future success (Locatis, Gaines, Wei-Li, Gill, & Ackerman, 2015).

The other major issue with video conferencing courses is related to student resistance. It is likely that this is a result of the technology related problems (Hoyt, Howell, Lindeman, & Smith, 2013). Another related concern is the inconsistency of student engagement at remote locations. This seems to be more of an issue with courses that utilize more on hands-on, active learning approaches.

In short, there is much optimism among faculty that video conferencing technologies will extend course offerings and opportunities across multiple campuses while reducing costs and commute time for students. Our results of faculty perceptions about video conferencing help confirm reliable infrastructure and technical help are key factors in instructor acceptance. Further research will be need to determine what devices work best or if there are certain pedagogy strategies that optimize this type of learning environment. Additionally, more research is needed to determine whether certain types of courses are a better fit for video conferencing classes.

REFERENCES

- Fox, B. I., McDonough, S. L., McConatha, B. J., & Marlowe, K. F. (2011). Establishing and Maintaining a Satellite Campus Connected by Synchronous Video Conferencing. *American Journal of Pharmaceutical Education*, 75(5), 1-10.
- Grodal, S., Gotsopoulos, A., & Suarez, F. F. (2015). The Coevolution of Technologies and Categories During Industry Emergence. *Academy of Management Review*, 40(3), 423-445.
- Hedderly, D. J., & Scott, H. (2015). Measuring the Effectiveness of Video Training through Technology-Based Education. *SAM Advanced Management Journal*, 80(1), 41-50.
- Hoyt, J. E., Howell, S. L., Lindeman, S., & Smith, M. (2013). The Feasibility of Offering Videoconferencing Courses: Quality Issues and Lessons Learned. *The Journal of Higher Education*, 61(2), 94-103.
- Locatis, C., Gaines, C., Wei-Li L., Gill, M., & Ackerman, M. (2015). Lessons learned from ten years of distance learning outreach. *Journal of the Medical Library Association*, 103(2), 78-82.
- Locatis, C., Gaines, C., Wei-Li, L., Gill, M., Carney, J., Foster, J., & Woods, M. (2006). A blended training approach using videoconferencing for distance education. *Journal of the Medical Library Association*, 94(4), 464-468.

- Mithas, S., & Rust, R. T. (2016). How Information Technology Strategy and Investments Influence Firm Performance: Conjecture and Empirical Evidence. *MIS Quarterly*, 40(1), 223-246.
- Richardson, J. C., Fox, W. S., & Lehman, J. D. (2012). Successful Videoconferencing: Scenarios for Teacher Education Programs. *Tech Trends*, 56(5), 17-24.
- Taylor, T., Nichol, D., & Dziuban, C. (2011). Supporting Practice-Based Learning with Video-Mediated Technologies: An Overview. *International Journal of Therapy and Rehabilitation*, 18(9), 513-519.
- University of South Florida Institutional Research (2008). *Faculty and student assessment of technology: Videoconferencing*. Sarasota-Manatee, FL. Retrieved September 8, 2015, from http://legacy.usfsm.edu/ir/reports/vcsummary_fall08.pdf
- Welsh, E. (2002). Dealing with data: Using NVivo in the qualitative analysis process. *Forum Qualitative Social Research Journal* 3(2). Retrieved May 1, 2016, from <http://www.qualitative-research.net/index.php/fqs/article/view/865>
- Zalud, B. (2015). Cost-Effective Video Strategies. *Security: Solutions for Enterprise Security Leaders*, 52(11), 87-89.

APPENDIX 1
FACULTY PERCEPTIONS OF VIDEO CONFERENCING COURSE Delivery Survey

[Q1] How many video conferenced courses have you taught?

Technical Support and Training

- [Q2] Do you feel you received adequate technical support?
[Q3] If you do not feel you received adequate technical support how could this be improved?
[Q4] Did you attend one of the scheduled training sessions provided through Academic Affairs?
[Q5] Do you feel you received adequate training?
[Q6] If you do not feel like you received adequate training how could this be improved?
[Q7] Are there any aspects of the technology, such as the video or audio that you have identified as needing improvement?

The Students

- [Q8] Did you feel resistance from the students?
[Q9] If so, did you feel this more from the remote site or the main site?
[Q10] Do you feel there were any added benefits to students by using video conferencing?
[Q11] Were student performances on tests, work assignments and/or class participation comparable at all sites?
[Q12] Overall, what do you feel students' reactions were to the video conferencing of the course?

Overall

[Q13] What was your overall comfort level with various technologies, not just video conferencing, before teaching via this method?

- [Q14] What is your overall comfort level now after implementing the video conferencing technology?
- [Q15] What did you like the most about video conferencing your course?
- [Q16] How many additional hours of preparation were needed, weekly and before the start of the course?
- [Q17] What challenges or barriers did you face when video conferencing your course?
- [Q18] Is there anything you would change about the way in which you organized the course to incorporate the video- conferencing aspect?
- [Q19] Do you have any suggestions for others who may attempt to use this technology?
- [Q20] Do you have any suggestions for administrators?
- [Q21] Anything else you would like to add?