

## Research Paper

# The Perceptions of Faculty Members of Education Regarding the Technology-Based Implementations: Lecture Capturing

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## ABSTRACT

Technology-based teaching approaches such as flipped classroom and blended learning are becoming increasingly common as educational technology takes root. Lecture capture is one of these approaches; and using lecture capture, lecturers either share their lessons online or make necessary changes before they are made available for review by students. However, while this application has become widespread in teaching syllabi, it has prompted further discussion concerning the pedagogical impact of lecture capture on lecturers and students, including lecturers altering conventional teaching methods during recording, the intellectual property rights of materials used during lecture capture, student absenteeism, and the impact of lecture capture on students' success rate. This study investigated the perceptions of professors within a College of Education about their experiences and opinions regarding advantages and disadvantages in the lecture capture approach as well as their suggestions with a special focus on the pedagogical use of this approach. A qualitative research design based on the principles of the constructivist paradigm was used to explore professors' perceptions of lecture capture. The findings indicated four themes: attendance and participation, professional development, academic freedom, ethical/legal issues and institutional policy. The professors, in general, found the use of LC positive and useful. However, the findings suggest that the professors have concerns about academic freedom, student participation in lessons, ethical and legal issues, and institutional policy.



## INTRODUCTION

In response to significant changes in student profile, education has changed dramatically, with the distinctive rise of technology-based teaching approaches. As the millennials and digital learners, raised in a digital world, take their places in classrooms, new technology-based teaching approaches have emerged in order to accommodate the changing learning styles and needs. These learners differ from previous generations because they are dependent on technology and technological tools as a learning source. In addition to this, worldwide spread of new diseases such as the coronavirus/ COVID-19 has caused a sudden shift away from the classroom in many parts of the world to online/e-learning platforms leading the rise of remote forms of teaching and learning. Thus, many schools at all levels have looked for the ways of adapting the new technologies: learning management systems such as Blackboard, Moodle and Canvas; synchronous technologies such as Blackboard Collaborate, and Adobe Connect; lecture recording technologies such as lecture capture and Echo360; and learner-generated tools such as e-portfolios. As a matter of course, recent studies have focused on technology-based teaching approaches such as flipped classrooms and blended learning, pointing to their advantages and potential drawbacks (Leoni & Lichti, 2009; Wanner & Palmer, 2015). Lecture recording tools, Lecture Capture (LC) and Echo360, defined as the capturing of live lectures in a digital format, are becoming increasingly popular in higher education. These technologies work to enable access to the recording via a password-protected learning management system (LMS) and allow lecturers not only to make lessons available online for review but also to share asynchronous/synchronized videos and to make changes beforehand. Recent research indicates a consistent increase in the use of lecture capturing tools at universities because the advantages of the approach outweigh the disadvantages as far as pedagogical aspects are concerned (Green, et al., 2012; O'Callaghan, et al., 2017). The studies highlight that the focus should be on the pedagogical use of these tools available rather than finding the perfect technology (Gosper, et al., 2008; Phillips, et al., 2007).

Regarding the disadvantages of lecture capturing tools, the issues causing most controversy in the literature are the potential for a decrease in attendance, intellectual property rights, academic freedom and the use of recordings for the purpose of teacher performance evaluation (Gosper, et al., 2010; Maynor, et al., 2013). Although many researchers have voiced concerns that access to lecture recordings result in a decrease in attendance, previous studies indicated that this is not a new issue and, additionally, that attendance is a separate issue from that of learning outcomes (Massingham & Herrington, 2006; Newton, et al., 2014;). Study results suggest that access to lesson recordings does not contribute to student attendance decisions, which are instead based on the topic of the lecture, their positive or negative experiences with the lecturer, the lecturer's teaching approach, and the predicted outcome of the lecture (Billings-Gardiardi & Mazor, 2007). Rather than provide evidence that recordings reduce attendance, studies have shown

that students value face-to-face lectures since they provide more interaction with peers and lecturers (Gosper, et al., 2008; Jensen, 2011). Related to legal considerations about academic freedom and intellectual property rights, it is firmly stated in the literature that it is an institution's responsibility to determine policies on the length of time recordings are kept, procedures for dealing with the recordings when the lecturer leaves the institution, and issues of transparency about rights and ownership as well as the use of the recordings for lecturers' performance evaluation or appraisals (Jisc, 2015).

Regarding the advantages of lecture capturing, studies have indicated that students value having access to and make use of lecture recordings for a range of purposes, such as for a learning resource, examination preparation, and backup for courses missed for extenuating circumstances such as illness and adverse weather conditions, as well as increased accessibility to students who may need extra time for understanding, such as those with disabilities, and non-native speakers of the language of instruction (Gosper, et al., 2010; Mallinson & Baumann, 2015; McNeil, et al., 2007; Yeung, et al., 2016). Students state that lecture recordings increase their satisfaction as a learning resource because they can personalize their learning, using recordings at their own pace wherever and whenever needed for revision, clarification, and note-taking (Gysbers, et al., 2011; Scutter, et al., 2010; Tarr, et al., 2015). By using video recordings, students can improve understanding of topics they find difficult and add details to their notes (Vajoczki, et al., 2011). Studies also show that students with disabilities and with difficulties caused by instruction in a foreign language benefit by being in complete control of pace of the lesson, and by their freedom to choose where and when to study (Leadbeater, et al., 2013; Nordmann, et al., 2017; Shaw & Molnar, 2011, Taplin, et al., 2011). The studies by Scutter, et al., (2010) and Show and Mohar (2011) found that recordings improved the grades of non-native English students and created a fairer environment for special needs students. Regarding the use of recordings for examination preparation and backup for courses missed, Phillips, et al., (2007) and Gosper, et al., (2008) argued that access to recorded lectures had a positive impact on learning, improved students' performance, and reduced anxiety due to the opportunity to revisit lectures and reinforce their learning. Another strand of the literature on the positive aspects of lecture capturing revealed that recordings cater to different learning styles and also provide an opportunity for lecturers to get self-feedback, reflect on their delivery, and, thus, enhance student experience (Briggs, 2007).

The majority of research reviewed and summarized above focused on the positive and negative aspects of lecture capturing in circumstances when used as a supplement rather than as a replacement for live lectures. There seems to be a consensus that the positive attributes of lecture capturing outweigh the negative ones; however, an extensive review on lecture recording suggested that the pedagogical value of lecture recordings has been neglected, and, therefore, that more research is needed in order to ensure maximum benefit to both students and faculty (Gosper et al., 2008; Burnett & Meadmore, 2002). Thus, the purpose of this study was to investigate the perceptions of professors of education, experts of teaching theories, about their experiences and opinions regarding the lecture capturing approach and to identify their pedagogical practices of recording lectures within a college of education. The researchers hope that the results of the study will contribute to the general understanding of lecture capture as a teaching and learning approach, and will be useful for faculty members who work within different disciplines such as engineering, medicine, and art. The study addressed the following research questions:

- What are the perceptions of professors of education regarding the factors that facilitate and prevent using the lecture capturing system?
- What are their pedagogical suggestions to improve the lecture capturing systems?

## **METHOD**

This research was conducted in collaboration by the two researchers, one from Turkey and one from the United States during the Turkish researcher's stay as a visiting researcher at the host university in New York State during the Academic Year 2018/2019. Prior to the research, ethical approval was obtained from the Institutional Review Board at the host institution, and all ethical issues such as participants' informed consent and confidentiality were carefully undertaken throughout the study. The aim of the current study was to investigate the preventive and facilitative factors of lecture capturing from the perspectives of professors, and from these perceptions, to gain insight into lecturers' strategic use of recorded lectures for teaching. Furthermore, the primary investigators in this study aimed to support lecturers and students by identifying best practices in integrating recorded lectures into the teaching and learning process. A qualitative research design based on the principles of the constructivist paradigm was considered the most appropriate to explore professors' perceptions of lecture capture (Crotty, 1998). According to Hatch (2002), qualitative research is about understanding the meanings that individuals construct in order to participate in their social lives. Both of the researchers who took an active part in the adaptation of the lecture capturing system at their universities have been using the system since the system was set up, which is an important factor in maximizing the quality of the study. The data was collected by the guest researcher in order to minimize bias and subjectivity; analytical generalization was made, and the findings of similar studies were compared.

## **Context**

The research study was conducted within a college of education at a small, comprehensive state institution in Western New York State. Founded in 1826, it is a four-year, public liberal arts university with a population of approximately 4,800 students, a quarter of whom study in the university's Professional Education Unit. The College of Education has undergraduate and graduate programs in different areas with around 50 full- and part-time faculty members. The College adopted Echo 360-equipped classrooms for professors and pre-service teachers in 2012. Classroom computers with Echo360 software programs are programmed to begin and end recording coinciding with the class session. The system captures the lecturer's voice as well as the material shown using the video projector. After the class, the recordings are automatically uploaded and converted into digital files for students to view.

## Participants

A purposeful sampling approach was used to identify the volunteer participants. An email about the research was sent to potential participants using the lecture capturing system and working within the college of education. Twelve professors (9 females and 3 males) with varying years of service ranging from 15 to 35, agreed to participate in the study. Participation was entirely voluntary. No personal information that would identify the participants was collected and no incentive for the participants was offered.

## Data Collection and Analysis

The data were collected through semi-structured interviews. The researchers developed an interview protocol based on the literature review, and consulted with an expert in order to ensure the content validity of the form, which covered issues such as the effect of lecture capturing on attendance, participation and classroom atmosphere, the purpose of use, the problems encountered, concerns, and suggestions for improvement of the system. The form also included a brief section on demographic details such as sex, experience, and department.

Interviews were organized taking the time-tables of participants into consideration. The interview protocol followed the framework developed by Holstein and Gubrium (2003), in which respondents were asked to reflect on their experiences working with the lecture capturing instructional approach. Consent forms were signed at the beginning of each interview session; professors were asked for their candid views on their teaching experiences with LC; interviews were recorded on cell phones with participants' consent and agreement; and alternatively, notes were taken. Throughout this process, the researcher used a relatively informal, conversational interviewing style, as recommended by Maykut and Morehouse (1994). Confidentiality was guaranteed during the study, with pseudonyms used for interviewees. Interviews lasted for between 17 and 35 minutes, with an average of 26 minutes with a total duration of 312 minutes. The recordings were uploaded, without identifying details, to the guest researcher's computer.

Before the analysis, the researchers agreed that all the data collected (verbalizations/notes taken) would be transcribed before analysis in order to save time. After the transcription was finalized, inductive analysis was employed throughout the analysis process. In the course of analysis, initially, the data were analyzed independently by two researchers, who then worked together to revise the coding. The analysis process was finalized after the two researchers reviewed and reanalyzed the data thoroughly based on the final coding figure. Finally, inferences were drawn based on the codes and categories. According to Coffey and Atkinson (1996), coding fractures the data and opens interpretation to higher levels of abstraction. This process is conducive to discovery of core categories, promotes integration of analysis, and yields desired conceptual density. Transcripts of all interview sessions were provided to subjects for clarification and approval. In the presentation of the quotes in the findings section below, participants were labeled as Professor (P).

## FINDINGS AND DISCUSSION

The data collected from the interviews generated four themes regarding the factors facilitating and preventing the professors using the system: attendance and participation, professional development, academic freedom, ethical/legal issues and institutional policy, as well as the suggestions on how to use lecture capturing considering pedagogical aspects. These findings are summarized in Table 1. and in the narrative discussions below:

**Table 1.** The analysis of the interviews and the themes identified

Participants	Themes			
	Attendance/ Participation	Professional Development	Academic Freedom	Ethical/ Legal issues & Institutional Policy
P1	++	++	+	
P2	+++	+		
P3		+		+
P4	+		+	
P5	+	+		
P6	++		+	
P7	+		+	+
P8			+	++
P9	+	+		
P10		+		+
P11	+		+	+
P12	+	+		

### **Theme: Attendance and Participation**

Regarding attendance, in general, the lecturers thought that recording lectures does not prevent students from attending the lecture and students still value face to face lecture, highlighting the benefits of recordings such as catching up on a lesson students missed due to extraneous reasons or emergencies, reviewing for examinations, and improving learning. They believed that what has impact on attendance is not the technology itself but the teaching methodology of the professor. However, they emphasized that, whether the institution has an attendance policy in place is another important factor for students' attendance decisions. In that sense, professors seemed to find the system facilitative since the recordings can be used as a back-up of a face-to-face lesson.

*'I don't think that you can blame recording lecture system or this kind of technology any more than you can blame posting a PowerPoint. I don't think that has an impact on attendance' (P1)*

*'I guess, attendance comes down to some degree to instructors; we should plan our teaching in a way that students are motivated and engaged' (P2)*

*'I suppose for some students, it can be very beneficial here, in the snow if someone cannot get to class to have a backup' (P2)*

*'I do believe that the students still see a value in being in attendance, that going to real lecture, there is more to it, than just listening to the lecture. They use recordings as a review' (P4)*

*'If there was an emergency, if they were a sick or if they had a conflict I think it is excellent for them to be able to tap into it' (P5)*

*'If you don't have the attendance policy, I don't know how that would impact students coming, but also I think students do like face to face interaction with the instructor and with the peers, they need human interaction, so I don't think this technology has particular impact on student attendance' (P6)*

These results seem to be consistent with the other studies that claim that access to lecture recordings does not result in a decrease in attendance and that students appreciate the value of face to face lectures (Gosper, et al., 2010; Jensen, 2011; Newton, et al., 2014). The research on attendance suggests that students basically make their decisions based on the topic of the lecture, their positive or negative experiences with the lecturer, and the lecturer's teaching approach (Billings-Gagliardi & Mazor, 2007). However, the professors who participated in the study emphasized that the existence of cameras in the classroom and the feeling of being recorded might have a negative impact on students' active participation in the lesson, which seems to be a deterrent factor for them to use the capturing system in the classroom. They think that capturing lectures may have an effect on students' participation in terms of reluctance to talk, potential invasion of privacy, student consent, high anxiety, and a positive learning environment, as cited below.

*'I believe that if you are going to use LC, you should probably get the consent from students because it is an invasion of their privacy' (P9)*

*'For different reasons, individuals may not want to be captured; I think that could impact their participation' (P12)*

*'I don't feel it particularly has impact on participation. I think the technology is not very intrusive, you don't even see where the camera is in the classroom; however, we should get their consent and inform them of the existence of the camera' (P6)*

The research which has been conducted so far largely focuses on the effect of LC on students' attendance to the classroom physically rather than the effect of LC on students' participation in the classroom in terms of their reservations such as the fear of making mistakes, privacy, and reluctance to join in-class activities. Thus, further studies could be suggested regarding the impact of lecture capturing on student participation.

### **Theme: Professional Development**

Regarding professional development, the professors thought that the recordings facilitate their professional development in a way that they watch their recordings, make self-reflections, identify their strengths and weaknesses, and improve their teaching. In that sense, they found the system useful and practical. In addition to that, they also highlighted the importance of the recordings for pre-service teachers during their practicum/demonstration lessons, stating that pre-service teachers gain awareness about their strengths and weaknesses when they watch their own recordings. As cited in the quotes below, recordings are perceived as an important pedagogical tool for professional development:

*'I recorded myself once and watched myself, I found it annoying to watch how often I used "ok", so it must be annoying for the students as well. For self-reflection, it is probably a great tool' (P1)*

*'I have my students do it. Because they have to record themselves and watch themselves, I do it too. It is awful, awful to watch yourself. It is horrible, it is uncomfortable, but you do pick up on the things you want to improve because your memory of a lesson is different from what actually happened in the lesson' (P9)*

*'My students have difficulty in identifying what they are doing well, and what they are not doing well. Like a picture worth thousands of words, so a little short video of them helps them figure out what they are doing. It is a very careful scaffolding - 'self as a model'. It is a powerful learning tool for any learners. You know like little people learn how to swim too' (P3)*

*'Instructors can go back and reflect on their own teaching what did I do well; what are the areas I may need to improve' (P5)*

*'It is also a practical tool because pre-service teachers can simply use one of their best recordings when they apply for a job' (P1)*

This finding seems to be consistent with the other study results which suggested that watching the recordings improves both learning and teaching because it reduces anxiety and provides an opportunity for lecturers to get self-feedback. These studies particularly emphasized the benefits of using the recordings for classroom observations to see oneself in action from an exterior viewpoint; for sharing best practices as a mentoring material; for peer-to-peer evaluation in order to facilitate consultative discussions; for collective evidence of teachers meeting professional standards; for determining specific areas to focus on for professional development; for a review of classroom layout for learning effectiveness (Briggs, 2007; Gosper, et al., 2010; Woo, et al., 2008).

### **Theme: Academic Freedom**

Academic freedom has become a widespread concern throughout academia in recent years (Berube, 2006; Schrecker, 2010). Nelson (2010) defined this concept: "academic freedom establishes a faculty member's right to remain true to his or her pedagogical philosophy and intellectual commitments. It preserves the intellectual integrity of our educational system and thus serves the public good" (p. 1). According to the data collected from participants, the Lecture Capture approach presents some unique challenges to professors in terms of protecting their rights to professional autonomy in the classroom and their intellectual property. The professors interviewed for this study shared a number of concerns about the LC system, which they perceived as having a deterrent factor on their ability to make choices about content and pedagogy based on their professional knowledge. During interviews, the professors spoke about their concerns regarding the use of LC and the effect that it might have both on their ability to speak frankly with their students about a wide range of topics and the willingness of their students to engage openly in these discussions as given below. One professor commented about the chilling effect that lecture recording might have on his/her ability to address what s/he referred to as "misconceptions" within the science curricula:

*'I think maybe my reluctance in doing, using lecture recording is in the moment in the classroom...questions sort of...pull people. In science education, there are a lot of misconception-based things, so I think trying to not archive these misconceptions. That is why I haven't used this approach.' (P11)*

*'Existence of the camera could impact the way you teach. You know, being able to have good discussions in the classroom ....those learning experiences.... Well, we have to think twice before we say something because we are concerned about giving a wrong answer. I mean, it is not a natural atmosphere; you cannot share your opinions freely' (P4)*

*'Well, how can I put it... It makes the relation between teacher and student artificial. I mean there is always an element, what is happening if technology is there or what is happening when there isn't? What is the difference? So you need to know really whether students are hesitant because the camera is there' (P7).*

*'They could have legitimate concerns about being captured / video during participation, sharing ideas.....People are reluctant to talk because they are lecture captured. I would prefer sort of healthy type of conversation in my class' (P1).*

The findings that emerged from the data collected from participants regarding the issue of academic freedom correspond closely with the contemporary research on the subject, as summarized above. This critical research illuminates the threat to intellectual freedom for instructors posed by current neoliberal trends in education, including standardized assessment and accountability. From the testimony of the academic professionals interviewed for this study, it is clear that institutions must be clear and transparent in their policies regarding the use of LC and should use caution in regard to employing LC with regard to evaluation of teaching practice.

### **Theme: Ethical/ Legal Issues and Institutional Policy**

Ethical and legal issues appear to be a deterrent factor for professors regarding the use of the system. The issues such as intellectual property, copyright, ownership, and institutional policy regarding issues such as training, orientation, policy, guidelines, notification, consent of lecturers-students were raised as main problems during interviews with participants. Regarding ethical and legal issues,

the lecturers shared their concerns about intellectual property, copyright, and ownership. The participants indicated that recording lecture was a potential threat to their ability to control the content of their intellectual output. As cited in the following quotes, professors shared their concerns on these issues.

*'Even if you restrict who can see it, when something is out, nothing is secure. So that becomes an issue. I just put it on. It is my intellectual property, what happens if somebody else uses it' (P8)*

*'Students never appear in the video. It focuses me on my work. It is me writing, my hand... whatever. If they ask a question, it comes in an audio way no image' (P8)*

*'I strongly believe that the trainings should include pedagogical aspects, not only technical issues, which is more important' (P7)*

Research on ethical issues such as intellectual property rights, and ownership firmly states that it is an institution's responsibility to determine policies on the length of time recordings are kept, procedures for dealing with the recordings when the lecturer leaves the institution, and issues of copyright infringement, and transparency about rights and ownership (Jisc, 2015; Witthaus, 2016). Some studies also suggested that the lecturer's inappropriate usage of intellectual property in open educational resources through the use of media (e.g., videos, images) that they did not own the copyright for appears to be another type of ethical issue, which should be considered carefully (D'Antoni, 2009). In summary, lecture recording may be disruptive to higher education in ethical aspects since there are potential social disruptions surrounding the manner in which data is captured, collated and shared. Thus, widespread adoption of lecture recording requires a comprehensive understanding of intellectual property rights among lecturers and a strict adherence to rules.

### **Suggestions on Pedagogical Use of LC**

Based on their experiences, the professors shared pedagogical suggestions on the ways to use the system effectively, stating that the most important factor is not the technology in place, but, rather, the way that it is utilized. They suggested that the length of the recordings should not be very long; lecturers should spend time on recordings such as adding examples and index marks for important information, deleting the irrelevant sections of the recordings, creating a precise content rather than simply sharing them with students, emphasizing the objective and learning outcomes of the lesson at the very beginning of the recording, making the recordings more functional in order to attract more students, paying attention to the confidentiality issues, being open, clear and transparent as cited below:

*'LC is used from start to finish, let's say for 50 minute session. What does the instructor need to modify the video, to animate in order to make it functional for the students' (P3)*

*'The duration/length is the problem. Some of our classes are 90 minutes long. How do you help the user to use a very big video well? There are lots of ways of doing it. But, basically, the shorter the better. Creating learning chunks and have interactions within it would be digestible by the students (P3)*

*'Sometimes we spent the money on so-called advanced technology but if you don't use it, it is waste of money. If we ask students to make their presentations using these devices, or do mini demo lessons with pairs, then students can go back and make reflections on that' (P6)*

*'Students should be aware of how to use this recordings, are they aware of their weak areas? What do they need to improve? instructors may use index mark systems, the instructor can identify students' responses/questions to the topic during the lecture, identify the weak areas or the areas which should be improved and can work on it accordingly. Chunking the recording, or indexing the lecture based on the subject matter, instead of just sending it out as it is. Maybe creating small portions together. Is there a way to speed up/slow down recordings? e.g., if the subject is a foreign language, students may want to slow down the recording; however, if somebody is familiar with the topic, they may speed up the recording. Which makes it more efficient accessing and using the recordings. So overall it comes down to instructional resources. How do you consume or how do you create?' (P7)*

*'We should be sensitive about how we are using the technology, I pay a special attention not to record the students but the board and the materials. When I explain how I am gonna use the technology, borders, limitations etc., they feel relaxed and comfortable' (P1)*

The studies on lecture capturing highlighted the importance of integration, interaction, and engagement. These studies suggested that the recordings should include clear learning objectives, rich content, clear review segments, pre- and post- lecture activities, interlinking with supporting texts, discussion boards, chats, resource links, and self-assessment quizzes allowing commenting and other interactive tools (Chang, 2007; Fardon, 2003). Growing interest in identifying and encouraging active use of the recordings indicates that lecture capturing can be used as a blended learning tool that facilitates a flexible self-paced mode of learning supported by pre- and post- lecture activities (Davis, et al., 2009; Karakostas, et al., 2010; O'Donoghue, et al., 2007). In fact, recent technology of lecture capturing appears to lend itself to discussion of educational and instructional topics via social networking tools.

## CONCLUSION

The findings of our study suggest that the professors participating in the investigation, in general, perceived that the use of LC is positive and that they find it useful. As reported above, the participants believed that the system is helpful for students because they can review the lesson for examinations or catch up on the missed courses. They also believe that it does not affect the student attendance negatively, emphasizing that it is the teacher's approach and the importance of the content that makes a difference rather than the capturing lecture system. Furthermore, viewing the recordings seems to make contributions to the professional development of professors as well as to that of pre-service teachers. However, they mentioned that there are factors that prevent them from using the system effectively. The findings suggest that the professors have concerns about academic freedom, student participation in lessons, ethical and legal issues, and institutional policy. The results indicate that professors pay special attention to what they say and share during the lesson, which might have a constraining effect. Furthermore, their observations in the classroom suggested that some students do not feel comfortable being recorded and participating in the discussions during lessons. They underline the importance of clear institutional policy on ethical rules if they have this type of teaching implementation. In the light of the present study, it seems that simply providing teachers and students with the technology is not a solution for learning and teaching. Policy and decision makers should consider pedagogical and methodological aspects in technology based approaches. In this respect, the researchers suggest the following general implications:

- Offering orientation trainings for teachers and students on how to use the system effectively such as technical issues, pedagogical aspects, and the purpose of the system.
- Dividing recordings into meaningful portions, since capturing long blocks of teaching might be deterrent for students, sharing the lesson's learning outcomes at the beginning of each recording, using headings and sub-titles, labelling the recordings so that it is easy to find the related course and section.
- Using the LC system for professional development for both teachers and pre-service teachers as part of the institutional culture such as self-evaluation, self-reflection, and peer coaching.
- University administration should have clear rules and regulations in writing such as ethical and technical aspects of the recording process, and intellectual property rights.

In conclusion, it is obvious that technology is indispensable in teaching and learning, particularly for the next generation of learners who will be even more wedded to the use of online modes than were previous generations. This is likely to only be exacerbated by global changes in higher education. The current role of instructional technology in higher education appears to be supportive and facilitative in relation to live lectures; however, the underlying pedagogy and methodology should not be neglected. It is also clear from the results of our study that the legitimate concerns of faculty about the encroachment of Lecture Capture should not be dismissed. Future research on the effect of recordings on student participation, and the ways to integrate pedagogical aspects into technological tools use will be necessary in order to minimize these concerns.

## REFERENCES

- Bérubé, M. (2006). What's liberal about the liberal arts: Classroom politics and "Bias" in Higher Education. *Acad. Quest.* 20, 78–85 (2007). Retrieved from <https://doi.org/10.1007/BF03033408>
- Billings-Gagliardi S., & Mazor K. M. (2007). Student decisions about lecture attendance: Do electronic course materials matter? *Academic Medicine*, 82(10), 73–76. Retrieved from <http://10.1097/ACM.0b013e31813e651e>
- Briggs, L. L. (2007). Classroom capture: Lecture recording system draws devotees at Temple. *Campus Technology*. Retrieved from <https://campustechnology.com/Articles/2007/02/Classroom-Capture-Lecture-Recording-System-Draws-Devotees-at-Temple.aspx?p=1>
- Burnett, Bruce M. & Meadmore, Peter J. (2002). Streamed Lectures: enhanced pedagogy or simply 'bells and whistles'? In Jeffery, P (Ed.). *Proceedings of the 2002 Australian Association for Research in Education Conference*. Australian Association for Research in Education, Australia, pp. 1-12. Retrieved from <https://eprints.qut.edu.au/15757/>
- Chang, S. (2007). Academic perceptions of the use of Lectoria: A University of Melbourne example, in Proceedings ascilite Singapore, eds R. J. Atkinson, C. McBeath, S. K. A. Soong & C. Cheers, Centre for Educational Development, Nanyang Technological University, Singapore, pp. 135-144.
- Coffey, A. & Atkinson, P. (1996). Making sense of qualitative data: Complementary research strategies. Thousand Oaks, CA: Sage.
- Crotty, M. (1998). Foundations of social research. Thousand Oaks, CA: Sage.
- Davis, S. J., Connolly, A., Linfield, E. (2009). Lecture capture: Making the most of face-to-face learning. Engineering Education. *Journal of the Higher Education Academy Engineering Subject Centre*, 4(2), 4-13. Retrieved from <http://www.engsc.ac.uk/journal/index.php/ee/article/viewArticle/132/170>
- D'Antoni, S. (2009). Open Educational Resources: reviewing initiatives and issues. *Open Learning: The Journal of Open and Distance Learning*, 24(1), 3–10. Retrieved from <http://doi.org/10.1080/02680510802625443>.
- Fardon, M. (2003). Internet streaming of lectures: a matter of style. *Proceedings of Educause 2003*. Adelaide, University of Adelaide.
- Gosper, M. McNeill, M., Phillips, R. Preston, G., Woo, K & Green, D. (2010). Web-based lecture technologies and learning and teaching: A study of change in four Australian universities. *ALT-J: Research in Learning Technology*, 18(3), 251-263. doi: 10.1080/09687769.2010.529111.

- Gosper, M., Green, D., McNeill, M., Phillips, R., Preston, G., Woo, K. (2008). Final report: The impact of web-based lecture technologies on current and future practices in learning and teaching. Sydney: Australian Learning and Teaching Council. Retrieved from [http://www.altc.edu.au/carrick/webdav/site/carricksite/users/siteadmin/public/grants\\_project\\_webbasedlecture\\_report\\_aug08.pdf](http://www.altc.edu.au/carrick/webdav/site/carricksite/users/siteadmin/public/grants_project_webbasedlecture_report_aug08.pdf).
- Green, K. R., Pinder-Grover, T., & Millunchick, J. M. (2012). Impact of screencast technology: Connecting the perception of usefulness and the reality of performance. *Journal of Engineering Education*, 101(4), 717-737. Retrieved from <https://doi.org/10.1002/j.2168-9830.2012.tb01126.x>
- Gysbers, V., Johnston, J., Hancock, D., Denyer, G. (2011). Why do students still bother coming to lectures, when everything is available online? *International Journal of Innovation in Science and Mathematics Education*, 19(2), 20-36, 2011.
- Hatch, J. A. (2002). *Doing qualitative research in education settings*. Albany, NY: State University of New York Press.
- Holstein, J. & Gubrium, J. (Eds.). (2003). *Inside interviewing: New lenses, new concerns*. Thousand Oaks, CA: Sage.
- Jensen, S. A. (2011). In-class versus online video lectures: Similar learning outcomes, but a preference for in-class. *Teaching of Psychology*, 38(4) 298-302. Retrieved from <https://doi.org/10.1177/0098628311421336>.
- Jisc (2015). *Recording lectures: legal considerations*. Retrieved from <https://www.jisc.ac.uk/guides/recording-lectures-legal-considerations>.
- Karakostas, A., Demetriadis, S., Ragazou, V. (2010). E-Lectures to support blended instruction in multimedia programming course. *Proceedings of the fifteenth annual conference on Innovation and technology in computer science education -ITiCSE '10* (1-60558-729-X, 978-1-60558-729-5), (p. 189). New York, New York, USA. Retrieved from <http://doi.acm.org/10.1145/1822090.1822144>
- Leadbeater, W., Shuttleworth, T., Couperthwaite, J., Karl P. & Nightingale, K. P. (2013). Evaluating the use and impact of lecture recording in undergraduates: Evidence for distinct approaches by different groups of students. *Computers & Education*, 61, 185–192. doi: 10.1016.
- Leoni, K. & Lichti, S. (2009). *Lecture Capture in Higher Education*, Northwestern University, Evanston, IL.
- McNeill, M., Woo, K., Gosper, M., Phillips, R., Preston, G. & Green, D. (2007). Using web-based lecture technologies – advice from students, in Enhancing Higher Education, Theory and Scholarship. *Proceedings of the 30th HERDSA Annual Conference*, Adelaide, 8-11 July 2007: pp 365.
- Mallinson, D. & Baumann, Z. (2015). Lights, camera, learn: Understanding the role of lecture capture in undergraduate education. *Political Science & Politics*, 48(3), 478-482. doi:10.1017/S1049096515000281.
- Massingham, P. & Herrington, T. (2006). Does attendance matter? An examination of student attitudes, participation, performance and attendance. *Journal of University Teaching & Learning Practice*, 3(2), 82–103.
- Maykut, P. & Morehouse, R. (1994). *Beginning qualitative research: A philosophic and practical guide*. London, UK: Falmer.
- Nelson, C. (2010). Defining academic freedom. *Inside Higher Education*. Retrieved from <https://www.insidehighered.com/views/2010/12/21/defining-academic-freedom>.
- Newton, G., Tucker, T., Dawson, J., & Currie, E. (2014). Use of lecture capture in higher education – Lessons from the trenches. *TechTrends*, 58(2), 32-45. Retrieved from <https://doi.org/10.1007/s11528-014-0735-8>.
- Nordmann, E., Calder, C., Bishop, P., Irwin, A. & Comber, D. (2017). Turn up, tune in, don't drop out: The relationship between lecture attendance, use of lecture recordings, and achievement at different levels of study. *High Educ* 77, 1065-1084. Retrieved from <https://doi.org/10.1007/s10734-018-0320-8>
- O’Callaghan, F. V., Neumann, D. L., Jones, L., & Creed, P. A. (2017). The use of lecture recordings in higher education: A review of institutional, student, and lecturer issues. *Educational Information Technology*, 22, 399–415. doi: 10.1007/s10639-015-9451-z.
- O’Donoghue, M., Hollis, J. & Hoskin, A. (2007). Lecture recording: Help or hinder in developing a stimulating learning environment? In ICT: Providing choices for learners and learning. *Proceedings ASCILITE Singapore 2007*. 769-770. retrieved from <http://www.ascilite.org.au/conferences/singapore07/procs/odonoghue-poster.pdf>.
- Phillips, R., Gosper, M., McNeill, M., Woo, K., & Preston, G. (2007). Staff and student perspectives on web based lecture technologies: Insights into the great divide. *Paper presented at ASCILITE*. Dec 2-5, Singapore. Retrieved from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.119.6857&rep=rep1&type=pdf>.
- Schrecker, E. (2010). *The lost soul of higher education: Corporatization, the assault on academic freedom, and the end of the American university*. New York: The New Press.
- Scutter, S., Stupans, I. Sawyer, T. & King, S. (2010). How do students use podcasts to support learning? *Australian Journal of Educational Technology*, 26(2), 180-191. Retrieved from <http://doi.org/10.14742/ajet.1089>
- Shaw, G. P. & Molnar, D. (2011). Non-native English language speakers benefit most from the use of lecture capture in medical school. *Biochemistry and Molecular Biology Education*, 39(6), 416–420. Retrieved from <https://doi.org/10.1002/bmb.20552>
- Taplin, R.H., Low, L.H., Brown, A.M. (2011) Students’ satisfaction and valuation of web-based lecture recording technologies. *Australian Journal of Educational Technology*, 27(2), 175–91. Retrieved from <https://doi.org/10.14742/ajet.964>
- Tarr, J., Farrington, S., Pittaway, J., Bird, M-L., Hoffman, K., Douglas, T. & Beh, C-L. (2015). Challenges for this place or any place: student preferences for lecture ‘places’ in a blended learning environment. In T. Thomas, E. Levin, P. Dawson, K. Fraser & R. Hadgraft (Eds.), *Research and Development in Higher Education: Learning for Life and Work in a Complex World*, 38 (pp 446-458). Melbourne, Australia. 6 - 9 July 2015.
- Vajoczki, S., Watt, S., Marquis, N., Liao, R., & Vine, M. (2011). Students approach to learning and their use of lecture capture. *Journal of Educational Multimedia and Hypermedia*, 20(2), 195-214. Retrieved from <http://www.learnchlib.org/primary/p/36105>.



- Yeung, A., Raju, S., & Sharma, M. D. (2016). Online lecture recordings and lecture attendance: Investigating student preferences in a large first year psychology course. *Journal of Learning Design*, 9(1), 55–71. Retrieved from <http://www.jld.edu.au/article/view/243>.
- Wanner, T., & Palmer, E. (2015). Personalizing learning: Exploring student and teacher perceptions about flexible learning and assessment in a flipped university course. *Computers & Education*, 88, 354-369.
- Witthause, G. (2016) *Lecture capture: what can we learn from the research?* Loughborough University publication. Retrieved from <https://artoflearning.com/2016/04/29/lecture-capture-what-can-we-learn-from-the-research/>.
- Woo, K., Gospera, M., McNeilla, M., Prestonb, G., Greenc, D., & Phillips, R. (2008). Web-based lecture technologies: blurring the boundaries between face-to-face and distance learning. *ALT-J, Research in Learning Technology*, 16(2), 81-93. Retrieved from <http://researchrepository.murdoch.edu.au/12163/>. ISSN 0968-7769 print/ISSN 1741-1629.