
Forensic-free AV surveillance audit podcasts for e-competence of academics and staff – repurposed traditional instructions for blended, distance and self-study e-learning to maximise lecture capture ROI

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Abstract: This study describes forensic-free Audio Video (AV) surveillance audit podcasts. Since the surveillance systems are typically funded for security reasons, any additional applications such as e-learning and training are of minimal additional expense. To facilitate this capability, it is a matter of ‘splitting’ the video cable of a surveillance camera and connecting it into the instructor’s computer. Administrators and students can then monitor the quality of lecturers and academic staff at their own time and pace. For example, subscribers can view and participate in a lecture from their cellphone from a remote physical location. An instructor can *repurpose* the videos of such a lecture – from the traditional stand-up instructions offline, into blended, remote and self-study e-learning online and with Computer Assisted Instructions (CAI). This study illustrates how videos of academic courses recorded for undergraduate, graduate students practicing professionals and alumni can be *repurposed* for Continuing Professional Education (CPE). Using new podcasting methods, students no longer need to manually download multimedia materials, such as videos from a website, wait for hours with narrow bandwidth or wait for traditional mail to get a DVD for playback. Instead, they can simply subscribe to a Real Simple Syndication (RSS) service and the videos will automatically download into subscribed devices, combined with selected alerts via cellphones and email. [AQ1]

AQ1: Please reduce the length of abstract to a maximum of 150 words.

Keywords: lecture capture; ROI; continuing education; distance learning; blended learning; repurposing; surveillance; audio video; RSS; real simple syndication; podcasting; e-learning; CAI; computer assisted instructions; multimedia.

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Biographical notes: [AQ2]

AQ2: Please provide not more than 100 words of brief career history of each author.

1 International Continuing Engineering Education (CEE), Continuing Professional Education (CPE), Continuing Medical Education (CME), Continuing Legal Education (CLE) and learning in general

A focus of this paper is to promote e-competence for lecturers and academic staff with the use of Information and Communication Technology (ICT) in the classroom. This in turn can help raise the quality of instruction. This study develops and tests a theory that surveillance capability combined with additional compensation and personal promotion will motivate the instructors, lecturers and academic staff to be more skilled and more effective educators.

In the past few years, there has been a huge growth of electronic technology available for educators to take advantage of. The integration of *repurposed* video into electronic education has not been fully implemented. Yet, for individuals and organisations, such integration can be very rewarding financially and educationally.

This study uses the subject area of Forensic Studies, including forensic medicine, engineering, and business, and especially forensic accounting for explanation purposes. There currently exists a number of forensic accounting training courses and programmes at different universities and colleges in order to certify the acquisition of e-competence. The current study focuses on *repurposing* such regular academic courses for Continuing Professional Education (CPE), Continuing Engineering Education (CEE), Continuing Medical Education (CME), and Continuing Legal Education (CLE), without the traditional extra cost. Instead, this study leverages the existing surveillance infrastructure, *repurposing* the classroom video equipment for continuing education and lifelong learning of university alumni. In this regard, educators and lecturers are conceived as *gate keepers*, i.e. they have the *key* for a sustainable dissemination of e-learning in higher education.

2 Examples of e-competence and life-long learning compare the traditional versus our approach

2.1 Comparing our approach to the more traditional 'The Teaching Company' corporation approach of providing e-competence and life-long learning

The Teaching Company Corporation represents the traditional selection of instructors for life-long video education, as they describe in their own language:

"Only the top 1 in 5000 college professors is chosen to be on The Teaching Company's faculty.¹ Our professors are gifted scholars, enthusiasts, communicators – and, yes, entertainers. America has more than 500,000 college professors. Since 1990, we have identified the top 1% of professors based on teaching awards, published evaluations of professors, newspaper write-ups of the best teachers on campus, and other sources."

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The problem with the traditional method is that it is expensive, time consuming and most importantly presumptuous. It is assuming that somebody can pick the best instructor for the target audience. In contrast, the authors' approach of a self-vetting top lecturer selection system, assumes that the audience can pick the best speakers by their hit rates, downloads, etc. Furthermore, this way they do not have to pick a single instructor for an entire course, but rather a single instructor for every subject for each course. A course may have hundreds of subjects, and sub-subjects. This way one instructor may rank the highest in one subject, such as break-even analysis in management accounting, while another instructor may top the first instructor in the subject of budgeting. This way, the student gets the best of the best in each subject category. Each subject maybe a chapter in a DVD and a video clip on the World Wide Web and maybe as short as 1 minute² or as long as 27 minutes.³

2.2 Videos banner ads, sponsor advertisers underwrite the cost, provide additional ad revenues, hyperlinks that can dial the number, and port the user to the advertised URL

Notice that the videos have banner ads, which helps the service provider, such as a university, attract sponsor advertisers that will underwrite the cost and provide additional ad revenues that the traditional providers such as The Teaching Company do not use. These banner ads on the videos are also hyperlinks that can dial the number, and port the user to the advertised URL. The service provider gets another revenue streams from the ad, with additional commission for every sales of a product or service that it advertises. Furthermore, if the students copy and distribute the media, they are also helping the provider distribute the ads, and further raise its ROI on the lecture capture services.

2.3 Multiple recording modes, from outside and inside the computer, sync by the time line

Likewise, it gives the authors of this study the flexibility of multiple recording modes. The traditional video camera recording mode, such as a surveillance PTZ camera, recording from outside of the computer from a remote location on the ceiling of a classroom. Another recording mode from inside the computer, the lecture capture includes the screen images and the audio recorded through the microphone on the computer.⁴ This example illustrates the lecture capture of a picture in picture approach, where the instructor teaches about Microsoft Office Accounting demonstrating the software, while the webcam displays her face on the monitor and the microphone of the computer amplifies her voice through the speakers, and records it on the instructors local removable flash drive, on the hard drive, and on a network drive, with a WWW http server, as well as a DVD-Recorder in standard definition, and a BD (Blu-ray Disk) in high definition. We can playback and podcast these separate but related video stream archives, in sync by their common sound files, and time lines.

2.4 Automated free vetting system, that provides virtually instant time to market, for free, and the opportunities to boost the ROI with premium services and products

'Time is money', and a short time to market is important to maximise the ROI. Especially in cases of emergency, and fast-moving high-tech industries, a short time to market maybe the difference between life and death, or profit and loss.

The Teaching Company describes how "Each year, our professional recruiters travel the country from Harvard to Stanford, UCLA to UNC – and listen to hundreds from the top 1%. Of these, we select about 1 in 20 to give a sample lecture for The Teaching Company. Each sample lecture is then reviewed by hundreds of our customers." Besides being very expensive, this process takes a long time, and slows the time to market. In contrast, our approach of letting instructors stream, archive and podcast their contents to the web, provides almost an instant time to market, at no additional cost at all, since Google Video and YouTube are free services. Yet, if the viewer wants a DVD or high-definition BD, they will have to pay a premium and raise the ROI of the service provider.

The Teaching Company, Teach-12.com, claim that "Those professors who get a high score from our customers are invited to craft new courses. More than 15,000 of our customers have voted on sample lectures to select our faculty. In the end, we and our customers select about 1 in 5000 professors." These are limited to their customers, while our approach is to extend it to potential customers, and not limit it to existing customers. "In more than a decade of searching," The Teaching Company has "chosen more than 100 professors to make our courses. Why only these? Because" they claim that they "want only those professors who will make" our "time in the world of ideas a pleasure." Obviously, they confuse their customers and the rest of the world, and their 100 chosen instructors with thousands of instructors on the web who may be even better qualified than the 100 that they chose.

3 Forensic and investigative accounting classroom technology podcasts

Instructors have the opportunity to use current multimedia technologies for the integration of PowerPoint presentations with a surveillance video camera and a CD/DVD recorder. To see an example of such technology in action, see the Media Site example (<http://www.sonicfoundry.com/mediasite/recorders/>). The instructors podcast such videos, so that any device such as a computer, cellphone, PDA (Personal Digital Assistant), or a Blu-Ray DVD player can download and play the videos automatically at the time that the cameras stop recording. This is done without any human intervention, using RSS (Real Simple Syndication) feeds.

4 Spreadsheets, videos, powerpoint, WWW e-commerce sites, and mock trials playing cops and robbers games – what works?

4.1 Creating automatic test banks out of the transcripts of instructor recorded lectures

This study focuses on employing research methodologies that highlight the importance of forensic accounting, auditing, fraud mitigation, and litigation service issues. These instructional methodologies include multi-media capabilities, data management and data engineering.

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Software was developed that analyses and improves forensic accounting research skills, research tools and research techniques for all that use the software. This improvement is facilitated with automated *test banks* (software created test/exam records/databases) taken from the transcripts of recorded lectures and presentations.

The fraud simulations generate discussion and experimentation in instructional means, methods, and materials. From the instructional videos produced with the available in-house surveillance systems, transcripts (using Dragon Naturally Speaking software) are computer generated. We have used this approach for the academic content in the field of Management Information Systems in general and forensic accounting and auditing in particular.

4.2 The e-collaboration Open-Source Journal (OSJ) systems and Microsoft® Office live

Using the e-collaboration of Open-Source Journal (OSJ) Systems and Microsoft Office Live, one can demonstrate the integration of technology into the classroom, performing research, and consulting.

The e-collaboration leads to the exchange of ideas and findings about developments related to instructional multimedia, learning, teaching, and training. Lectures and presentations can automatically be published in the double blind *refereed* IT (Information Technology), secured, and public (unsecured) journals (<https://ejournals.library.miami.edu/index.php/it/index>) (this is a 'local' journal at the UM library website). The transcriber via the web transcribes in real time, and can automatically upload to the journal for the editing and *referee* (peer review) process.

These journals can solicit unpublished manuscripts by authors/instructors that are willing to have their lectures transcribed into articles of not currently under consideration by another journal or publisher. Each article will be edited by the authors, which will produce revised versions that are uploaded and stored on the journal's sites. The articles can be published electronically as soon as the editors complete their work, based upon advice from referees (peers), that together determine whether the manuscript meets the objectives and standards set forth by the journals' editorial board and its board of advisors.

5 Best practice examples concerning instructional design and course concepts

Best practice examples concerning instructional design and course concepts can best be done by peer evaluation. We are developing an automated journal of peer lecture evaluation. The instructor's lecture will be transcribed and the transcript will be automatically published in the journal subject to revisions and peer review acceptance.

Using the OJS (<http://pkp.sfu.ca/?q=ojs>) each manuscript submitted to the journal is automatically subject to systems' review procedures. This will depend on the area of specialty of the author and the topic of the article. Using IT automation, and the OJS software, the system spell checks the manuscript and checks the grammar, flagging it to the editor for language and/or format deficiencies.

Rushinek and Rushinek (1997) demonstrate a self-vetting system for 'Rating and Ranking Best Practices of the British Petroleum Oil Company and the Oil & Gas Industry'. As the system runs repeatedly, eventually the 'Sales to Cash Forecasting Univariate Regression Trend Analysis' emerges as the best practice among a large variety of 'Computer Modelling'. Even though, this was done for the Oil and Energy industry, the lessons apply to any search for best practices. This study promotes audio visual (AV) surveillance publications, and their download and viewing rates, ranking and rating publication, as a self-vetting system of best practices of e-learning and educational materials.

6 Standards for the evaluation of skills and e-competences

Standards for the evaluation of skills and e-competences are different in the USA and EU. Such differences have to be closed for the purpose of consolidated financial statements. To close such difference in different time zones, different continents, different language, require minimal IT skills and e-competences.

Rushinek et al. (1983) reported about empirical models of 'Development and Testing of a Discriminate Model for Measuring Changes in Instructor Evaluations Due to Using Computer Assisted Instruction (CAI)'. They demonstrated software programs based on a discriminate linear function for automating the gain of instructors' ratings for applications of computers in mathematics and science teaching (Rushinek et al., 1983). Rushinek and Rushinek (1983) show that such CAI and testing that are fast and responsive satisfying users in 'An Evaluation of Mini/Micro Computer Systems', using 'An Empirical Multivariate Analysis'. The results of the evaluations are stored in a database, for comparative time series analysis (Rushinek and Rushinek, 1983).

7 IFRS compliant AV HD recording audit of standards of effective learning strategies

Rushinek and Rushinek (2009a), have been conducting workshops for the American Accounting Association (AAA) about International Financial Reporting Standards (IFRS). These workshops raised the issue of compliance with multiple sets of unrelated standards in one integrated compliance efforts.

On the one hand, the AAA enforces some *teaching* effectiveness academic standards, while the accounting profession imposes another set of new *professional* accounting standards IFRS. The IFRS standards are currently enforced in the EU, but not in the USA.

Another standard of compliance is the legal compliance enforced by the US courts on forensic accounting expert witnesses. A compliant and effective learning strategy for expert witness's audio/video (AV) recording that is made in real-time, two ways, high definition (HD) for forensic IT networks multiplies the compliance issues.

The research that focuses on investigative accounting testimony, and computer litigation support, combined with effective learning strategies can be too expensive to justify, *unless* it leads to additional revenues and cost savings.

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Workshops can help local accounting professors learn how to teach and practice forensic accounting, while developing blended, distance and self-study educational tools. Such IFRS workshops require international collaboration to help in closing the gap between the common US standards of Generally Accepted Accounting Principles (GAAP) and the EU standards of IFRS.

8 Organisational strategies for the development of e-competences for academic staff

The American Institute of Certified Public Accountants (AICPA) and the American Accounting Association (AAA) has organisational strategies for the development of e-competences for domestic academic staff, much like universities around the world. The following are some examples of *repurposing* university classes in the study of *Forensic Accounting and Auditing* for continuing education and life-long learning. The successful promotion of the repurposing of a class drives down the ‘unit’ cost of that course/lecture and promotes e-competencies of the academic staff, instructors and the students.

9 AICPA’s Vision Project framework

The AAA describes the workshops as follows: “Attend this session to learn how to use a Group Learning – Teamwork teaching strategy to help teach specific elements of the selected core competencies that are included in the American Institute of Certified Public Accountants (AICPA’s) Vision Project framework.”

10 Description of training course programmes and workshops for e-competences

Course Programmes for E-competences (CPE) for accountants are training programmes and workshops for e-competences, making sure that they can keep their Certified Public Accountant (CPA) or similar certificates current. The following is a description of training course programmes and workshops for e-competences. Automating the process of recording, distributing, making the instructor an instant author of the materials, and rewarding them further with royalties of sales of the videos, the transcripts, the tests and assessments automatically generated from these transcripts will improve their overall competencies and performance.

The presenters, Avi Rushinek, University of Miami, and Sara Rushinek, University of Miami, describe it as follows: “Effective Learning Strategies (ELS) that *repurposes* stand-up traditional classroom instruction AV (Audio Video) surveillance recorded to a DVD, for real-time auditing, distance learning, CPE courseware, as well as tutor CDs and DVDs. As soon as the class is over, the instructor’s PC uploads the AV session to Google Video, and to a DVD-burner” (Rushinek and Rushinek, 2009b).

10.1 Cellphone real-time forensic audit of tele-medicine on the World Wide Web (WWW)

To complement the traditional after-the-fact auditing, this case study deals with real-time auditing. This means that the auditor watches the activities in while they occur; hence the term 'real-time'. The system is using the World Wide Web instead of limiting the access to the intranet; adding a potentially profitable online distances learning service (Rushinek and Rushinek, 2009b).

Rushinek and Rushinek (2008) demonstrate how surveillance video playback, peer evaluation and discussion of the 'Role Play Forensic Accounting, Auditing and Tax Expert Witness', can be very effective in 'Providing Testimony and Computer Litigation Support Teaching, Services, Research and Development'. It shows that such visual aids, as AV surveillance materials can dramatically enhance existing instructional technologies, while improving the security for the participants (Rushinek and Rushinek, 2008).

10.2 Using wireless cellphone and surveillance technology in the forensic accounting classroom

Let us review how forensic accounting instructors can use some of the above technologies in the classroom. The instructors can demonstrate 'Wireless Access Points' by sharing the recorded classroom videos wirelessly with students in the class, letting them download the media in real-time into their devices, and recording the in-coming video signal as it is displayed on their media player. This also demonstrates 'AV (Audio Video), Surveillance Recording', the students see how the camera that is situated at the back of the classroom can pan, tilt, and zoom (PTZ) an image into their laptop showing the display on their screen." The instructor can let students, with a cellphone and internet connectivity; control the PTZ IP (Internet Protocol) surveillance camera by using the phone as a remote control. An instructor/lecturer could have anyone in the world be the cameraperson since class is being broadcasted real time over the Internet Protocol.

As the surveillance video recording ends, the videos are automatically stored and uploaded to social video websites for viewing. Such websites include but are not limited to iTunes U[®], Google Video[®] and You Tube[®]. The Forensic Accounting instructor uses the videos to analyse the performance of the expert witnesses together with the session participants. The discussion highlights the pros and cons of the court behaviour of the experts, letting the experts express their views.

This activity also instructs the participants about Search Engine Optimisation (SEO) of videos on the web. They learn how to garnish the top 100 positions, on Google Video[®], using meta-tags, lecture transcriptions, video transcriptions, court-reporter techniques to index and internet searches of court document databases. They learn how an expert witness can promote his brand on Google Video[®], by monopolising the top 100 videos on certain search keyword meta-tags, such as Nets-Expert (<http://video.google.com/videosearch?hl=en&q=nets-expert&num=100#>). The instructor could invite practicing attorneys as guest speakers. The students can role-play as judges, prosecutors, defence attorneys and experience the 'examination of the experts' all while being recorded for later discussion and review.

11 Surveillance audit AV improves e-competence of lecturers and academic staff

Lecturers and academic staff have to demonstrate e-Competence to satisfy multiple partially overlapping required skills. They get twice the credit if they teach such courses, and become instant authors if they produce a set of surveillance AV DVDs, with e-books, test banks, and off/online CPE quizzes. Being professors in an accredited Association to Advance Collegiate Schools of Business (AACSB) business schools, they have to comply with the publication requirements of AACSB. When they teach forensic accounting to students and professionals they have to comply with National Association of State Boards of Accountancy (NASBA) and the American Institute of Certified Public Accountants (AICPA). When they conduct an audit and certify the publicly traded companies' financial statements they have to comply with Committee of Sponsoring Organizations (COSO). If it is a banking audit they may have to comply also with *Basel II*. Likewise, if it is a healthcare organisation (like a university hospital and wellness centre) they have to comply with *Health Insurance Portability & Accountability Act* (HIPAA). When they also serve as chairs of an academic accounting department they have to comply with the Equal Employment Opportunity Commission (EEOC) in the USA. In addition, when they teach about it, for these organisations they may have to comply with all of the above.

To maintain their certificates (CPA-Certified Public Accountant, CMA-Certified Management Accountant, CIA-Certified Internal Auditor, CISA/M-Certified Information Systems Auditor/Manager, CFA-Certified Fraud Examiner/Financial Analyst) they have to keep up their e-competence with all of these professional organisations. Some of them maintain multiple certificates such as CPA and CFA.

Recording, editing, distributing and viewing DVDs created using repurposed surveillance equipment enhances the live classes and improves the instructional quality through personal and peer review. Revenues generated by this repurposing can be shared with both the institution and the faculty.

Product/services in the manner of course/lecture blending, distance instruction and self-study education all add to additional funds generated for all parties involved. If security surveillance equipment is already in place and working, the cost of equipment is already been realised by the institution and only minimum capitalisation may be needed to begin revenue generation.

12 Summary, conclusions and implications

12.1 Summary

For the development of e-competences for academic staff, we studied areas of academic courses such as teaching math, sciences, data-processing, and forensic accounting. We have reviewed CPE Courses for e-competence in human resources development programmes, for university professors who need to maintain professional certificates such as CPAs. We examined best practice examples concerning of the oil and gas industries with implications for instructional design and course concepts. We have analysed reports and empirical evaluation of training programmes about the impact of various instructional techniques on the instructor and facilities evaluation gains. We

considered concepts, definitions, and levels of e-competence of both students and instructor. For students we investigated automatic test generation from lecture transcripts and instructor evaluation gains due to using CAI, etc. Finally, we explored standards for the evaluation of ICT-skills and e-competences, as set by accreditation organisations.

12.2 Conclusions

We have experienced tremendous improvements in ICT over the last 20 years from the emergence of the Personal Computers (PC) to the current growth of mobile devices, such as cellphones. We have illustrated, cellphone audit ICT, and implied that such trends are intensifying, and become more and more powerful and prominent. Integrating audio and visual downloads from a variety of traditionally unrelated sources are beginning to converge. Such areas include but are not limited to ICT, security surveillance AV, auditing, expert witness testimony and computer litigation support as well as CPE, CME, CEE, etc.

12.3 Implications

The future of e-learning is going to become more and more prominent. Instructors will teach traditional academic classes and at the same time lecture online. This prominence will facilitate blended and distance education programmes for students while authoring videos, transcripts, and generate test data-banks created from the transcripts of their lectures. Automated translation supplements, automated real-time transcription and subtitling will permit information to be disseminated across tradition culture and language barriers. This will probably influence social evolution in a scope never before realised.

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AQ3: The references flagged with [AQ3] are not cited in the text. Please cite them in text or delete details from reference list if not required.

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Notes

- 1 See http://www.teach12.com/ttcInq/great_professors.aspx
- 2 See <http://video.google.com/videoplay?docid=174235047925410966&ei=l2WeS-q0BYSwqQK8t7DmDA&q=nets-expert&hl=en#>
- 3 See <http://video.google.com/videoplay?docid=-1730455478282161764&ei=l2WeS-q0BYSwqQK8t7DmDA&q=nets-expert&hl=en#>
- 4 See <http://video.google.com/videoplay?docid=1117767002457787919&ei=l2WeS-q0BYSwqQK8t7DmDA&q=nets-expert&hl=en#>