120th ASEE Annual Conference & Exposition
FRANKLY, WE DO GIVE A D*MN
June 23-26, 2013

Paper ID #6422

The effectiveness of videos as a learning tool in an engineering ethics course: A students' perspective

Ms. Mona Itani, American University of Beirut

Mona Intani graduated from the American University of Beirut in 2006 and began a profession in computer and communications engineering. Itani has worked for multinational telecommunications companies for four years. After earning her master's in Engineering Management, she joined the engineering management program at the American University of Beirut. She currently teaches engineering ethics and is working on several research projects related to engineering education and management. She is currently pursuing her Ph.D. in the UK.

©American Society for Engineering Education, 2013

The effectiveness of videos as a learning tool in an engineering ethics course: A students' perspective

Abstract

Top engineering schools worldwide require their students to enroll in an engineering ethics course mainly because it serves as a soft introduction to real situations and scenarios usually encountered in the workplace. However, the effectiveness of the teaching of applied ethics courses remains controversial as some researchers argues that the conventional instructional methods result only in superficial effectiveness and recommend the use of interactive learning, case studies, problem solving, videos, games, simulation, and role-playing among other tools to improve the quality of ethics instruction. With the increasing use of videos in higher education across all disciplines from arts, humanities, and sciences to professional and vocational curricula, the question remains: Are videos really an effective tool for teaching ethics? If this is true, which videos are better to use, documentaries or commercial movies? What is the level of understanding of the students of these movies, and can they relate the content of the course to the ethical concepts embedded in the movie? This study aims at exploring the effectiveness of videos in meeting the objectives of engineering ethics instruction and determining which type of videos is most effective by surveying a number of students enrolled in an engineering ethics course at the American University of Beirut (AUB) about their perceptions of the different movies that they were exposed to during their enrolment in the course. By examining the surveys of 92 students it was concluded that videos are certainly a beneficial learning tool in engineering ethics courses and that the use of videos based on a true-story is more effective in achieving the course outcomes than showing hypothetical ethics videos.

Introduction

Researchers believed that introducing engineering ethics at the university level whether it is integrated across the curriculum or delivered in a stand-alone course is essential since it is supposed to introduce students to real situations and scenarios usually encountered in the workplace and will assist in equipping them with the needed analytical skills to solve similar ethical issues after graduation [4, 13, 20]. Moreover, the applied ethics courses help meet accreditation requirements such as ABET (Accreditation Board for Engineering and Technology) criteria of professional skills which includes "understanding of professional and ethical responsibility" [16]. Although researchers seem to agree that introducing engineering ethics should be done at the undergraduate level, they disagree on the means and effectiveness of doing so [8, 10, 11, 12, 17].

In order to minimize the risk of being only superficially effective as argued by Newberry, 2004, different universities have been using a variety of learning tools such as case studies, problem solving, videos, games, simulation, and role-playing in order to attain a better ethics learning experience and achieve the required outcomes of applied ethics courses [1, 11, 19]. So far, case studies have been the most popular tool used in teaching engineering ethics [3]. However, since case studies often involve a lot of reading from the

text which many students often find boring and difficult to follow, a need for innovative pedagogies arises [17, 19]. Since embedding videos in the teaching of applied ethics courses was recommended by researchers as an extension to using traditional case studies, several special institutes such as the National Institute of Engineering Ethics (NIEE) have devised a number of movies especially made for this purpose [5]. Ultimately, a video is a multimedia delivery of a case and can be of various formats such as a commercial film, television show or series, documentary, animation, or can be fictional/hypothetical and tailored for a certain purpose. Videos are believed to be an effective tool in teaching applied ethics course since many students are visual learners and would prefer viewing case studies as video clips instead of written text [8]. Loui, 2006 has tested the effectiveness of an engineering ethics video, Incident at Morales, and could conclude after using the DIT (Defining Issues Test) and a short ad-hoc survey that this video is indeed an effective way to make engineering students and professionals understand three major concepts in engineering ethics [8].
Unlike Loui, 2006 this research study does not aim at testing the effectiveness of a single video and therefore more than one video was used in order to examine whether using videos as a learning tool is effective in engineering ethics instruction. Moreover, a variety of videos was used to enable comparing different videos among each other and determine which types of videos are more effective in achieving certain course objectives such as understanding that safety, health, and public welfare considerations supersede the loyalty and faithfulness to one's employer.

This study aims to investigate the effectiveness of the inclusion of videos in an applied ethics course namely engineering ethics by examining the video experience of ethics students in the Faculty of Engineering and Architecture at the American University of Beirut. Effectiveness was not measured in terms of grades or performance but in terms of achieving the course objectives which most importantly include a good understanding of ethical concepts and relating them to real life in order to be able to apply them in the future in ones career. The course objectives that were tackled by the shown videos are listed below and listed again for each video in Table 1 in the "Results and Analysis" section. Most videos covered all seven listed course objectives except for "Inside Job" movie and "The History of the Credit Card" documentary that had special emphasis on business ethics rather than engineering ethics.

1. To distinguish between professional and personal ethics
2. To be able to identify ethical dilemma in context, analyze and evaluate the decisions made, and suggest alternative courses of action
3. To prioritize the fundamental cannon of engineering ethics codes "hold paramount the safety, health, and welfare of the public" when evaluating ethical dilemma on the job or making decisions/recommendations to management
4. To respect the diversity of cultures, traditions, and laws of foreign countries where one might work in
5. To assess levels of risk to the public in a certain project or product
6. To differentiate between engineering decisions and management decisions and practice speaking the manager language while adopting engineering ethics

7. To abide by the concepts of confidentiality, honesty, and integrity in determining the relationship with employers and clients

Research questions and hypotheses

With the increasing use of videos in higher education across all disciplines from arts, humanities, and sciences to professional and vocational curricula[21], the question remains to be: Are videos really an effective tool for teaching ethics? If this is true, which videos are better to use: documentaries or commercial movies? What is the level of understanding of the students of these movies, and can they relate the content of the course to the ethical concepts embedded in the movie? What can be done to enhance the experience of learning via videos? Are videos good learning tools on their own or can their effectiveness be improved with traditional teaching methods?

Study hypotheses:

- Embedding videos in applied ethics courses is beneficial to the learning experience of students and helps meet course objectives
- The use of commercial movies is recommended over documentaries or hypothetical ethical videos since the former are more popular and interesting to students

Research methods

Similar to Evans, 2008 and Maag, 2004 the study relied on students to self-report their learning experience with the learning tool under study, videos in this case, by using student surveys [2, 9]. The student questionnaire consisted of several objective questions (yes/no and rating questions) directly related to the understanding of the videos and how well students related them to the concepts of the course. Moreover, a few subjective open-ended questions were provided for the students to give their opinion about videos as a learning tool in engineering ethics and to explain which video related better to them if they were exposed to more than one video throughout the course. A sample of the questionnaire distributed to students is provided in the Appendix.

The research method involved surveying three groups of engineering ethics students, one group in the fall term and the second group in the spring term of academic year 2011-2012, while the third group was surveyed in fall term 2012-2013. The surveys varied between paper-based questionnaires and electronic-based questionnaires but all shared a very similar content. The main advantage of the used research method was the ability to obtain a high average response rate of 85% in a short time while the most inconvenient drawback was the limitation to the gathered responses with the inability to inquire further regarding certain ambiguous or unexpected responses. All three groups of surveyed students shared similar cultural (ethnic background and native language) and academic backgrounds (previous schooling and performance) with students being almost equally distributed among the different engineering majors offered by the university namely chemical engineering, civil engineering, mechanical engineering, electrical engineering, and computer and communications engineering. The number of males in the three sample

groups dominated the number of females and ranged between 67% and 80% of the overall students per class. Moreover, the course grade averages of all 3 groups lied between 84 and 85 on a 100 scale. Therefore it is assumed that the results obtained from the questionnaires in different semesters can be safely compared to each other given the similarity among the sample groups. The three groups of students were shown different movies (in terms of genre, duration, etc.) on purpose since one of the main objectives of the research study was to find out which movies would better serve the purpose of the course. All eight analyzed videos tackled the seven listed course objectives in the "Introduction" section with some videos emphasizing on one or more objectives more than the others.

In fall 2011-2012, 31 students of the engineering ethics course were shown two movies that are rich with ethical issues. The first was "The Informant" which is a commercial Hollywood movie based on the whistle-blower of ADM's price-fixing scandal Mark Whittaker's real story spanning more than a 100 minutes and was shown to students during an extra session. The second movie was "Henry's Daughters", a 35-minute hypothetical movie and the most recently released ethics movie by NIEE, was shown during regular class time. At the end of the term, the students were surveyed regarding their opinions of the two movies. 24 students responded to the questionnaire yielding a 77% response rate. In spring 2011-2012 the movie "Inside Job", which is a Hollywood documentary on the financial crisis of 2008, was shown to 37 students in the engineering ethics course. At the end of the term, the students were surveyed about their opinion of the course. 30 students answered the questionnaire yielding an 82% response rate.
In fall 2012-2013 several videos were shown to a class of 40 students. At the beginning of the term, a "Dilbert animation" short video was shown in class to introduce students to engineering ethics. Later during the semester, links to "The story of stuff project" videos were provided to students on the learning management system (LMS) in their relevant course modules. Moreover, links to four documentaries namely "The history of the credit card", "Seconds from disaster: Meltdown in Chernobyl", "Air crash investigation: Concorde's last flight", and "Seconds from disaster: The Deep Water Horizon" were provided to students for them to choose one video to watch online as a prerequisite to fulfill the requirements of one of the course assignments. Finally, the students were shown in class the NIEE movie "Incident at Morales" spanning 35 minutes and which is a very popular ethics movie in engineering ethics courses[15]. Out of the 40 students, 38 responded to the questionnaire yielding a response rate of 95%. The assignment average grade was 86/100 which was slightly better than usual (83/100 and 84/100 for The Informant and Inside Job respectively). Possible reasons for this improved performance can be attributed to the facts that students were able to choose their own videos and that they found the videos to be engaging and interesting.

The instructor played an active role in facilitating student learning after the students watched the movie(s) by holding discussion sessions (held by the instructor, assistant, or among students themselves) for those videos that had a pertaining assignment. Moreover, the instructor provided detailed assignment questions and requirements that directly targeted the course objectives covered by the watched videos. This role was reflected slightly by the students' perceptions to the importance of holding post-video discussion

sessions and by their performance on the written assignments. However, the analysis of this role will not be analyzed in depth in this study as it is beyond the main scope. Before responding to the questionnaire, the rationale and purpose of the survey was explained to students and they were highly encouraged to answer with complete integrity in order to ensure the validity and correctness of the resulting analysis while being reminded that the questionnaire was not a graded exercise.
The questionnaires that were distributed to the three groups shared to a great extent the same questions that varied between closed-ended (true/false, yes/no, rating) and open-ended questions pertaining to the movie experience. After the collection of the questionnaires, the responses were imported to a statistical analysis tool where the results from the 92 responses (85% average response rate) were analyzed.

Results and Analysis

A summary of the results of the most significant closed-ended questions of the questionnaires across three terms and pertaining to students' perceptions after viewing one or more of 8 selected videos are presented in Table 1.

Table 1: Summary results of student perceptions after watching selected videos

	The Informant (Hollywood)	Henry's Daughters (NIEE)	Inside Job (Hollywood)	History of the Credit Card	Seconds from Disaster: Meltdown in Chernobyl	Seconds from Disaster: The Deep Water Horizon	Air Crash Investigation: Concorde's last fight	Incident at Morales (NIEE)
Number of Respondents	24	18	30	8	9	11	11	35
Covered course objectives (listed in Introduction)	1, 2, 3, 4, 5, 6, 7	1, 2, 3, 4, 5, 6, 7	1, 2, 4, 5, 7	2, 5, 7	1, 2, 3, 4, 5, 6, 7	1, 2, 3, 4, 5, 6, 7	1, 2, 3, 4, 5, 6, 7	1, 2, 3, 4, 5, 6, 7
Average rating of ability to relate movies' content with the course concepts	4 .09	4.05	3.93	4.4	4.7	4.4	4.8	4.5
The course has contributed to understanding of the movie	100%	90%	93.3%	100%	100%	100%	91%	97%
The movie is adequate for the course	100%	95%	83%	100%	100%	100%	100%	97%
The movie well demonstrated how ethical issues arise in the workplace in real life	100%	95%	100%	88%	67%	88%	100%	97%
What I learned from this movie might help me in my future career	68%	65%	90%	88%	89%	88%	91%	87%
The duration of the movie is adequate	43% (~100 minutes)	95% (~35 minutes)	40% (~100 minutes)	62% (~60 minutes)	78% (~60 minutes)	62% (~60 minutes)	91% (~60 minutes)	77% (~ 35 minutes)
The movie is worthwhile to watch knowing its genre	96% (Real story)	52% (Fictional)	100% (Real story)	100% (Real Story)	100% (Real story)	100% (Real story)	100% (Real story)	47% (Fictional)
I recommend	90%	44%	93%	88%	100%	88%	91%	94%

showing this movie for the course in the future								
Answering the assignment questions helped better recognize the moral issues present in the movie	96%	N/A	79%	88%	78%	88%	91%	N/A
Holding a movie discussion session would be (have been) beneficial in better understanding the movie and the involved issues	83% (Discussion session held by instructor)	78% (Discussion session held by assistant)	87% (Discussion session held by instructor)	100% (Discussion done among students on an online forum)	56% (Discussion done among students on an online forum)	100% (Discussion done among students on an online forum)	91% (Discussion done among students on an online forum)	67% (Brief discussion session held by instructor)
Assignment Average Grade	83/100	N/A	84/100	86/100				N/A

Although self-explanatory, examining the results in Table 1 assures that the selected videos were indeed adequate for the course and that students have been greatly able to relate the movies' content with the course concepts introduced prior to watching the videos using traditional means such as lectures and power point presentations. On average, 88.3% of the students believed that the video they have watched well demonstrated how ethical issues arise in the workplace in real life. In addition, 82.3% of the students believed that what they have learned from the videos might help them in their future career. Since the latter two averages are considered to be high, it can be preliminarily drawn that videos are indeed an effective tool in achieving engineering ethics course objectives. This point is revisited when discussing the open-ended questions of the survey. The table also clearly shows that students did not necessarily learn best from the videos that they thought had an adequate duration as opposed to other movies of longer duration (The Informant vs. Henry's Daughters). Moreover, it can be clearly seen that students valued videos that were based on a real story more highly than those with a fictional plot such as the NIEE videos. Additional findings were the pronounced belief of 86% of the surveyed students that a movie discussion session would be a good supplement to the video learning experience and that answering assignment questions pertaining to the video would enhance the recognition of the pertinent moral issues.

All surveyed students who viewed "The Informant" and "Henry's Daughters" movies believed that both movies were adequate for the course and on average rated their ability to relate the movies' content with the course concepts as "4" on a 1-to-5 Likert scale where 4 corresponds to "well". Although students considered the movie "Henry's Daughters" to have an adequate duration (95%) and as easy to understand (75%), only 44% recommended showing it again in the course in the future. On the other hand, 90% of the responding students recommended showing "The Informant" as part of the course in the future although 57% thought it was too long and 77% complained about coming for an extra session to watch it. One of the main reasons for this variation can be best understood by examining the students' perception of the "worth" of each of the movies. Since "The Informant" is based on a real story, 96% of the responding students thought it was worthwhile to watch while 48% of them thought that "Henry's Daughters" is not as

worthwhile since it is based on a fictional plot. Therefore, we can conclude that students will be more attracted to watch movies that are based on real stories as opposed to fictional movies even if the latter might be characterized by a more apparent relevance to the ethical concepts learned in the classroom.

When asked whether a movie discussion session would be beneficial in better understanding the movie and its involved ethical issues, 86% replied by yes which indicates that it would be better to supplement the use of videos in ethics courses with discussion sessions to improve the learning experience.

Although the movie "Inside Job" was mainly about "business ethics" and not engineering ethics as students have expected, 28 out of 30 of the surveyed students recommended showing the movie again in the engineering ethics course in the future even though some commented on its relevance to engineering. Moreover, when asked about their opinion whether embedding videos in the engineering ethics course is beneficial, 28 answered by a definite yes while one student said it depends on the relevance of the movie and another thought it was a complete waste of time. When asked about the reason, most students said that watching videos makes the course more interesting because of the "visual" experience that makes the concepts more "tangible" and memorable as opposed to lecturing which they thought is more dry and theoretical. In addition, several students emphasized the importance of videos in exposing them to realistic ethical issues that they might face in the real life.

When asked which movie they preferred over the other, 43% of the third group stated "Incident at Morales" while 57% were in favor of the documentary video (one out of four as stated earlier) that they chose for their assignment. The 38 students all thought that embedding videos in the engineering ethics course was beneficial and many mentioned the words "extremely", "very", "definitely" and "of course" before the word "beneficial". Many students explained their answer by saying that videos are engaging, attractive, interesting and entertaining. Some students compared videos as a learning tool to other traditional tools used in the course and based their response on the effectiveness of videos in achieving the desired course outcomes: "I believe embedding videos in the ethics course was extremely beneficial. In fact, in the videos, we were able to see how a problem arises in the workplace and how it develops, it was a really good simulation to real life experience and will prepare us for what's out there. Not to mention that learning about a subject through watching a video is much more fun than reading it in a book or in a power point presentation". The response of some students related more directly to the effectiveness of videos in an engineering ethics course where they stated that "using the videos made it easier for us to receive your intended message" and that "seeing characters in action gives us more insight into the case and makes us reflect more about their dilemmas and understand (accept or refuse) their decisions". Moreover, around one-third of the students mentioned the word "real" in their response to whether videos are beneficial in engineering ethics courses; they were referring to real story, real life, real people, and real situations and stated that these elements are what made the video experience fruitful. This implies as stated before that students will learn best from "real story" videos because this knowledge will make them take the ethical issues arising in the

video more seriously as they will relate to real life and project it on their own personal career in the future. One student in response to whether videos are beneficial conditionally answered by saying that "As long as these videos are the result of a real life story, yes!" Some students implied that videos helped in identifying the engineering ethics course as an applied ethics course and not just as an ethics course since they presented a "practical aspect" of what the ethical concepts presented in class. One student in that direction mentioned that the course would be a philosophy course if it wasn't for the examples and videos given in class whereas another stated that "the videos highlighted the ethical issues and allowed us to understand them more in practice (not just theory of ethics) to see how ethical issues can be viewed in real life".

Conclusions and Future Research

Testing the effectiveness of any learning tool remains a challenge because of the difficulty of separating the different factors that might interfere in the learning experiences of students. In conclusion, it can be drawn from the results presented in Table 1 and the analysis of the open-ended questions of the study survey that inclusion of videos in the teaching of engineering ethics is certainly an engaging method for students to understand learned concepts in the course. Moreover, using videos might be an effective tool in the learning of applied ethics since 97% of the questionnaires' respondents believed that they were beneficial in understanding ethical concepts and relating them to real life. Thus, the first hypothesis of this study cannot be rejected. Moreover, the students showed a greater interest in "true story" movies and did not differentiate much between commercial movies or documentaries as long as they are based on real stories whereas they did put less value to the experience of viewing a hypothetical movie even if it was of a shorter duration and conveyed the ethical issues more clearly. This allows us to partially reject the second study hypothesis that states that commercial movies are more effective than documentaries whereas the second part of this hypothesis that states that commercial movies or documentaries are more effective than hypothetical movies cannot be rejected. In order to achieve the most effectiveness from videos shown in engineering ethics courses, it was found that these videos should be followed by in-class or online discussion sessions and by an evaluation activity such as an assignment.

In preparation for future research and as an extension of the current study, the use of videos in the engineering ethics course was further developed where students were required to create their own videos in the semesters following those of the above-mentioned study. Informal feedback from students has indicated that this project was the most valuable and memorable part of the engineering ethics course. The next step entails assessing the learning experience of the students when they were required to make up their own videos while embedding different engineering ethics concepts, dilemma, possible solutions, and decisions in a single multimedia product. This research can be further extended in the future to involve a larger number of students subjected to various ethics learning tools that go beyond the use of videos such as simulation, role-playing, and games. In addition, more comprehensive results can be achieved by using a variety of research methods besides questionnaires such as interviews and active participation of

students in the ethics instruction. There is also a need to extend such research beyond the classroom in order to measure the students' understanding of engineering ethics concepts in real contexts and assess the improvement (if any) in their ethical knowledge and decision-making abilities.

Appendix: Sample Student Questionnaire

1. Do you think that the course has contributed to your understanding of the movie?
   Yes No

2. How well did you relate the movie content with the ethical concepts covered in the course?
   1 = Not at all
   2 = A little
   3 = Somehow
   4 = Well
   5 = Very Well

3. The Movie was adequate for the course
   Yes No

4. The duration of the movie was adequate for the course
   Yes No

5. The movie was engaging
   Yes No

6. The movie was a good demonstration of how ethical issues arise in the workplace in real life
   Yes No

7. Knowing that the movie is (not) based on a real story makes it (less) worthwhile to watch
   Yes No

8. I have learned something valuable from this movie that might help me in my career in the future
   Yes No

9. Was holding an in-class movie discussion session beneficial in better understanding the movie and the involved issues?
   Yes No

10. Do you recommend showing this movie as part of the course in the future?
    Yes No

11. Do you think that embedding videos in the ethics course is beneficial? Why or why not?

12. Which of the two movies related better to you and could meet better the learning objectives of the course?

Bibiliography

1. Alpay, E. (2011). Student-Inspired Activities for the Teaching and Learning of Engineering Ethics. *Science and Engineering Ethics*. DOI 10.1007/s11948-011-9297-8

2. Evans, C. (2008). The effectiveness of m-learning in the form of podcast revision lectures in higher education. *Computers & Education*, 50, 491–498.

3. Harris, C. E., Pritchard, M. S., & Rabins, M. J. (2009). *Engineering ethics: Concepts and cases*. Wadsworth Publishing Company.

4. Harris, C. E., Davis, M., Pritchard, M. S., & Rabins, M. J. (1996). Engineering ethics: what? why? how? and when?. *Journal of Engineering Education*-Washington-, 85, 93-96.

5. Herkert, J. R. (2000): Engineering ethics education in the USA: Content, pedagogy and curriculum, *European Journal of Engineering Education*, 25(4), 303-313 Retrieved from http://dx.doi.org/10.1080/03043790050200340

6. Hodgson, K. (2012, May 25). [Using movie clips to teach ethics/philosophy]. Retrieved from http://digitalis.nwp.org/site-blog/using-movie-clips-teach-ethicsphilosophy/3845

7. LeClair, D. T., Ferrell, L., Montuori, L., & Willems, C. (1999). The use of a behavioral simulation to teach business ethics. *Teaching Business Ethics*, 3(3), 283-296.

8. Loui, M. C. (2005). Educational technologies and the teaching of ethics in science and engineering. *Science and Engineering Ethics*, *11*(3), 435-446. Retrieved from https://www.ideals.illinois.edu/bitstream/handle/2142/12246/ethicsedtech.pdf?sequence=2

9. Maag, M. (2004). The Effectiveness of an Interactive Multimedia Learning Tool on Nursing Students' Math Knowledge and Self-efficacy. *CIN: Computers, Informatics, Nursing*. 22(1), 26–33

10. McDonald, G. M. (2004). A case example: Integrating ethics into the academic business curriculum. *Journal of business ethics*, *54*, 371-384. Retrieved from http://link.springer.com/content/pdf/10.1007/s10551-004-1826-9

11. McDonald, G. M., & Donleavy, G. D. (1995). Objections to the teaching of business ethics. *Journal of business ethics*, *14*, 839-853. Retrieved from http://link.springer.com/content/pdf/10.1007/BF00872350

12. McWilliams, V., & Nahavandi, A. (2006). Using live cases to teach ethics. *Journal of Business Ethics*, 67(4), 421-433.

13. Newberry, B. (2004) The dilemma of ethics in engineering education. *Science and Engineering Ethics*. Vol.10, pp. 343-351. doi: http://dx.doi.org/10.1007/s11948-004-0030-8

14. Pilant, J. (2010, August 17). [Using film to teach business ethics]. Retrieved from http://southwerk.wordpress.com/2010/08/17/using-film-to-teach-business-ethics/

15. Riley, D., Ellis, G., & Howe, S. (2004). "To move people from apathy: A multi-perspective approach to ethics across the engineering curriculum. *In Proc., American Society for Engineering Education Conf*., Salt Lake City, Utah, June (pp. 20-23).

16. Shuman, L. J., Besterfield-Sacre, M., & McGourty, J. (2005). The ABET 'professional skills'—can they be taught? Can they be assessed?. *ASEE Journal of Engineering Education*, 94 (1), pp. 41–55.

17. Sims, R. R. (2002). Business ethics teaching for effective learning. *Teaching Business Ethics*, 6(4), 393-393. Retrieved from http://search.proquest.com/docview/211825206?accountid=8555

18. Sims, R. R., & Brinkmann, J. (2003). Business ethics curriculum design: Suggestions and illustrations. *Teaching Business Ethics*,7(1), 69-86. Retrieved from http://search.proquest.com/docview/211841024?accountid=8555

19. Solberg, J., Strong, K. C., & McGuire, C. (1995). Living (not teaching) ethics. *Journal of business ethics*,*14*, 71-81. Retrieved from http://link.springer.com/content/pdf/10.1007/BF00873738

20. Stephan, K. D. (2001). Is engineering ethics optional?. *Technology and Society Magazine*, IEEE, 20(4), 6-12.

21. Video Use and Higher Education: Options for the Future, June 2009. Retrieved from http://library.nyu.edu/about/Video_Use_in_Higher_Education.pdf