AC 2008-1466: IT'S ALL THERE: TEACHING COMPLEX MANAGEMENT CONTENT USING FEATURE FILMS

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Abstract

We all learn in a number of different ways and the learning process can be facilitated through the use of a variety of viewpoints and media. Thus to reach everyone, a variety of instructional methods is used, each leaving a different "mental footprint." The "cone of experience" indicates that people generally remember only about 10% of what they read, but 30% of what they see. In teaching complex management-related issues in a graduate engineering class, some of the content can be difficult to describe analytically because it involves a variety of human action. Coverage of such material can be greatly enhanced by the use of video material to provide illustrative examples of some practical situations and settings. Feature films can be used as a basis for homework assignments or as background material for in-class discussions. The paper presents a number of films that can be used for such analysis, indicating corresponding content and other resources. Issues covered include creativity, entrepreneurship, organizational behavior, ethics, and others. The common ways of framing the film-based material to build relevant class experience are also outlined.

Introduction

When Edmund Phelps (Nobel 2006 in economics) recognized cinema as one of his learning tools, he probably was not expecting to inspire Italian management consultants to write a book how watching movies can help managers[4]. The story, after the book was published last year, made news in the Wall Street Journal[15], indicating that perhaps watching feature films can be a good antidote for management books loaded with advice that is hard to apply practically.

Such an idea, however, is not entirely new[5]. Both feature and documentary films have been used as teaching and learning resources in a variety of disciplines, including psychiatry[18], history[13], anthropology and cultural studies[2], law[3], medicine[1], management[4,6,7,10,11] and perhaps others. Film as a teaching medium has found wide use in corporate training programs. However, the exclusive focus of the training films on issues related to a corporate agenda limits their appeal – they are typically a rather dull product. Also delivery of the film-based training in a corporate screening session with scripted and time-controlled discussion can easily turn off the viewers and have an effect contrary to the intended one.

Recent fast proliferation of film as a teaching tool is partially due to progress in media technology and growing availability of a large body of films. Movies available for rental from video stores currently include over 25,000 titles and include broad genres of filmmaking in a variety of formats.

Educators have explored the use of film medium to support teaching since the 1970s, with the advent of the first portable video recording devices. Most recent transition from VHS tapes to DVD and on-going transition to digital formats available on the internet have further accelerated this process.

Good feature films are enjoyable, entertaining and readily understandable. Coordinated effort and talent of screenwriters, directors, cinematographers and actors delivers visual portrayals of life that can be both memorable and thought-provoking. As such, they can easily trigger discussion and provide useful counterbalance to more traditional ways of teaching. Since the characters in the movies are not real, learners can be more honest in their reactions than they would normally be in discussion of actual situations. This is a unique effect of displacement, which allows the viewer to be simultaneously emotionally involved in a situation, and yet maintain distance enabling objectivity[5].

Engineering + Management + Movies = ?

Interestingly, a lot of feature films typically recommended for viewing by managers do not have engineering content. A lot of them also draw inspiration from either sport or military situations, in particular when it comes to covering such issues as leadership, teamwork or ethics. Such movies are primarily intended as an inspiration or a metaphor.

Finding films showing any engineering activities is much more difficult, perhaps because any engineering-related content requires additional effort to explain it to unprepared audiences. This may also explain why most of these films were not big box office hits (even though some have found quite faithful following). Additional challenge lies in the fact that any engineering development requires much longer time scales and greater complexity than, for example, closing a sale or making a snap hiring decision.

Feature films where engineering efforts play if not key, then at least a strong supporting role, although rare, do exist; a few good examples are listed in Table 1. Since contemporary engineering is also a group effort, management issues illustrated in these films are also abound. Overall it seems that engineers as lead characters do not inspire filmmakers as they do not induce much drama and tension required for good story telling. Mad scientists fare much better![8]

Below are brief summaries of selected movies from Table 1, which may help to provide some details on the storyline and related engineering/management issues.

The Flight of the Phoenix: tells a story of a diverse group of a cargo plane passengers who are picked up from a remote oil well, after it was closed by a corporate decision. The plane crashes amid the sandstorm. The survivors initially wait to be rescued, but eventually realize that their location is unknown, hindering their chances to be found. They start looking for alternative solutions. One is to walk through the desert. Another one appears as their water starts to run out. An arrogant aeronautical engineer proposes a radical solution – to build a new aircraft out of the wreckage, using remaining working engine and adding skids to take off. The group overcomes various obstacles and makes many sacrifices, but eventually succeeds and flies out, traveling on the wings of their rebuilt plane. It has also been revealed that the engineer was designing model aircraft, not the full-scale ones.

The making of the original movie actually involved building a flying prototype, and is well documented. The movie's remake in 2004 offers a chance to compare not only technological

changes over the span of 40 years, but also social sensitivities that changes over that period (issues of national stereotypes, gender, etc.).

Issues for class discussion: creativity, teamwork, leadership, overcoming adversity, diversity.

Bridge on the River Kwai: the background of the plot is created by the Japanese efforts to build a railway bridge in Burma during WWII. The bridge is being constructed using the slave labor of captured British POWs. The bridge falls behind schedule, partially due to Japanese incompetence (located in the improper spot, initial bridge collapses) and partially due to sabotage by the British prisoners. The main story on the surface can be interpreted as a war drama (which it is), but can also be explained as mutual exchange of services between two culturally-incompatible and mis-communicating entities. The main antagonists in the story are a Japanese camp commander and British colonel. In exchange for the reasonable treatment of the POWs under his command, the colonel aggress to help build the bridge, mistakenly thinking that he is proving British engineering superiority. In fact, both central characters exemplify failing leadership, where major flaws are masked by minor strengths, in particular when used to support misguided strategy (both men believe in their own rules of military conduct, either based on British tradition or Bushido code). The quality bridge is eventually built on time for the first Japanese military transport, but is then promptly destroyed by a small commando led by one of the former camp escapees.

Issues for class discussion: leadership, teamwork, groupthink, rules vs. judgment, culture clash, civil engineering (bridge building).

The First $20 Million Are Always the Hardest: the main character gives up a cushy marketing job to pursue a more fulfilling R&D job. He is assigned to lead a doomed-to-fail project developing a PC that will sell for $99.Not having available necessary resources he puts together a team of unassigned (read: difficult to deal with personalities) employees and partially succeeds only to see his effort stolen away by his envious boss, who trapped him to sign a non-exclusive patent waiver. Nevertheless, the team does not give up and comes up with a number of breakthrough solutions (eliminating the need for hard drive, RAM, and other peripherals). A prototype is created, but it crashes, is ugly and the price is still too high. More innovations are needed and the team stands up to the task, creating a computer operated by virtual glove and new look designed by the next-door artist.

Issues for class discussion: entrepreneurship, creativity, diversity, leadership, teamwork, computer and software engineering.

Gung Ho: tells a story of a laid off foreman at an American car factory. The plant, located in a small town, is closed and unemployment casts a long shadow on the future of the town. The main character is sent to Japan to persuade a Japanese company to take over. The arrangement constrains the workers (no union is allowed) who must perform according to seemingly impossible quality standards. The Japanese executive in charge has been assigned the task as punishment for being too lenient. Eventually cultural clashes lead to the possibility of a strike, which is averted but the tensions continue. The foreman makes a deal with the Japanese manager to keep the factory open if 15,000 cars can be produced in a month, but tells the workers that the quota is 13,000. Eventually the truth comes out, the workers go on strike, and the production

stops. Both managers start to assemble the cars themselves and others eventually join in. The quota falls short of one car, but the management is impressed and keeps the factory going. (Gung Ho is the Chinese expression for *working together*).

Issues for class discussion: leadership, work ethics, manufacturing, culture clash.

Table 1: Example set of feature films illustrating key organizational issues

Title	Director, year	Issues for discussion
Apollo 13	R. Howard, 1995	Teamwork, creativity, aerospace engineering
Bridge on the River Kwai	D. Lean, 1957	Work organization, civil engineering, leadership, ethics
China Syndrome	J. Bridges, 1979	Professional ethics, labor relations, leadership, nuclear engineering
Efficiency Expert	M. Joffe, 1992	Labor relations, work design, manufacturing
Flight of the Phoenix	R. Aldrich, 1965 J. Moore, 2004	Teamwork, aviation engineering, diversity
Gung Ho!	R. Howard, 1985	Work organization, labor relations, clash of cultures
Metropolis	F. Lang, 1927	Work organization, manufacturing, social issues
Modern Times	C. Chaplin, 1936	Work organization, manufacturing
Real Genius	M. Coolidge, 1985	Creativity processes, graduate studies
Space Cowboys	C. Eastwood, 2000	Aerospace engineering, teamwork, mentoring, professional ethics
Tampopo	J. Itami, 1985	Entrepreneurship, culture issues
The First $20 Million Are Always the Hardest	M. Jackson, 2002	Business startup, teamwork, legal issues, creativity
Tucker	F. Coppola, 1988	Technology and organizations, design and manufacturing

Educational Approaches

A number of teaching strategies can be explored using film and film clips. Most commonly movie material can be shown to stimulate group discussion (but groups should be small). In this approach material is shown to the group and the trigger questions are posed either before or after the viewing. These questions need to be focused and tailored to the particular teaching goals to eliminate any potential runaway discussions, which may be inadvertently triggered by the detail-rich film material. Another alternative is to use the whole movies or clips as assignments,

allowing for individual exploration of a particular concept or issue, and summarizing the result in a written form.

Film materials can be worked into a course structure in a number of different ways, such as, for example:

- A case study: case analysis is the most natural form as it is based on the film narrative which can provide rich amount of details (*You've Got Mail* – business strategies of a small shop facing retail giant, *Gung Ho!* – factory survival under foreign pressure and takeover, *Tucker* – business case for automobile designer, *The First 20 Million* – organization of a start-up company)
- Experiential exercise: some situations depicted in films can form a basis for experiential exercises, in which student can track, for example, a decision-making process and explore different decision scenarios based on their own preferences (*Apollo 13* – problem of the safe return of the damaged spacecraft, *Flight of the Phoenix* – water rationing issue).
- Cultural experience: films create an opportunity of exposure and insight to situations and environments that are much different than our own (*Tampopo* – Japanese executive lunch and work habits, also in *Gung Ho!*); in case of movies that have been remade over time additional opportunities exist to observe changes in cultural norms and technology(*Flight of the Phoenix* – team diversity, technology of the day in aviation, communication and hand tools).
- Meaning and metaphor: film is an excellent medium for providing meaning to theories and concepts (*Modern Times* – assembly line); metaphors clarify complex concepts, make them less abstract and offer insight (*Metropolis* – factory as a monster).

Student Response

Some of the films listed in Table 1 have been successfully incorporated into the curriculum in graduate-level classes taught by the author[17]. With class sizes varying between 12 and 25 students and tight class schedule it is rather difficult to include full movie viewing during class time, so only selected clips are shown instead. Full feature film reviews are assigned as homework and occasionally also used for in-class discussions.

Overall, the students exposed to the use of film as additional class material have a very positive reaction, underscoring the fact that such experience allowed them to take a fresh look at some of the movies they have seen before, but also anchor concepts that initially were perhaps too vague or abstract.

For example, feature film "The Bridge on the River Kwai" (1957) is an excellent depiction (among other issues covered) of the groupthink phenomenon. One of the students in his comments analyzing the film wrote:
> *"It has been more than twenty years when I first watched the movie 'The Bridge on River Kwai.' The only memory in my mind was that a group of POW's kept their spirits high and built an awesome bridge. However, when I watched the movie again this time based on the organization theory class study, I was surprised to realize that this movie is full of interesting content we have covered*

in the class, such as professional ethics, moral values, groupthink, organizational development and leadership".

An alternative film for analysis of the groupthink behavior was "The China Syndrome" (1979). Another student in his commentary found a lot of relevance to the issues of today:

> *"Even though the movie is bordering on 25 years old, some of the same ethics questions that were brought out in the movie are still continuing today. Movies like these tend to raise the questions of company loyalty vs. professional ethics or even personal ethics. The business world can be a very difficult area to do the right thing at times because of the emphasis placed on companies making money even if it means cutting corners, disrespecting fellow workers or lying to investors or the public".*

Copyright Issues

It is broadly believed that the use of movies for the purpose of teaching is protected under the Fair Use Doctrine. This legal construct, as written in the US Copyright Code (Title 17, section 107) [14] enables use of copywritten materials to be used for educational purposes. While tempting, due to technical simplicity and convenience, copying films either entirely or in extended clips, should be avoided as it may constitute copyright infringement. Also, different rules may apply to off-air taped materials and use of films in fee-based workshops or training[5].

Advantages and Disadvantages of Educational Film Use

Films are a very familiar medium to contemporary students, and that helps to maintain student interest in class subject. As argued by Johnson[12], introduction of increasingly complex content in television shows and movies, improves our cognitive and decision-making abilities, even though it is often times difficult to evidence. Nevertheless, popularity of recent television shows such as *Numb3rs*[16], which successfully introduced mathematical thinking and problem solving to mainstream viewers, testifies that use such a complex medium can have positive educational impact.

Films offer both cognitive and affective experiences. They can induce good discussion, assessment of individual's values, and self-assessment when viewing content with strong emotional impact. Time constraints limit broad use of film in the classroom and require well-structured session organization; it may also require forewarning of viewers of sensitive content. Also use of foreign films may meet student resistance due to a need of subtitle reading. There is also a high likehood that some cultural subtlieties of the context will be missed or misunderstood.

Proper analysis of the films requires at least rudimentary understanding of film theory and film techniques (language). Non-humanities students usually do not have such a background and have to become aware of the potential emotional impact films may have on them. They also often fall short on analysis, because of their own ability to express their thoughts on subjects that may be remote from their professional interests.

Films should not be used in the classroom as stand-alone devices. Despite all of the interesting and relevant content, any potential viewers should be aware that movies, as part of the popular culture can operate using stereotypes[8,9], or distort the truth to serve a political agenda.

Summary

This paper advocates for the use of feature films as great teaching resources. It highlighted some of the issues of film use in classroom context (both positive and negative) and provided some common strategies: films can be used for case studies, experiential exercises or expose them to different cultural settings. Examples of feature films with content relevant to management and organizational issues were also provided.

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