

Optimal use of video for teaching the practical implications of studying business information systems

- a case study among of first semester business students.

Benedikte Fog, Jacob Kannevorff Stigsen Ulfkjær, Bjarne Rerup Schlicter

Department of Business Administration, Aarhus University, Business and Social Sciences,

Aarhus, Denmark

Abstract

The study of business information systems has become increasingly important in the Digital Economy. However, it has been found that students have difficulties understanding the practical implications thereof and this leads to a motivational decreases. This study aims to investigate how to optimize the use of video to increase comprehension of the practical implications of studying business information systems. This qualitative study is based on observations and focus group interviews with first semester business students. The findings suggest that the video examined in the case study did not sufficiently reflect the theoretical recommendations of using video optimally in a management education. It did not comply with the video learning sequence as introduced by Marx and Frost (1998). However, it questions if the level of cognitive orientation activities can become too extensive. It finds that video should be introduced early during a course to prevent students' misconceptions of working with business information systems, as well as to increase motivation and comprehension within the academic area. It is also considered of importance to have a trustworthy person explaining the practical implications to the students since it increases credibility of a video. Lastly, it is important to make sure that the sound quality of a video is good in order to prevent unnecessary distractions.

Keywords: *Optimal use of video, Business information systems, Undergraduate Students, Teaching, Comprehension.*

Introduction

The study of business information systems has become increasingly important due its more central role in the new Digital Economy. This implies that the study of information systems as a discipline at universities should be treated with maximum attention (Sabau et al., 2010). However, a study conducted by Jonson, Sigvardson and Schlichter (2011) observed that many students seem to have difficulties understanding and grasping the relevance of studying business information systems. This led to a negative impact on motivation for the students (Jonson et. al. 2011, p. 1). The use of video has formerly been proved successful as a medium for distributing knowledge in an educational context (Mathiesen et. al. 2012). Video as a medium has also shown; "...to command the attention of the viewer and heighten affective arousal toward the subject matter" (Hannafin, 1986).

The above mentioned observations led to the interest in the use of video as a medium for teaching the practical implications of studying business information systems, and thereby also increase motivation and comprehension among students. Therefor a video was introduced. The video contained the Chief Information Officer (CIO) of a major Danish corporation. In the video, the CIO explains the connection between management and business information systems and its real life practical implications as he experiences it.

The aim of this study is to examine how to optimize the use of video to increase comprehension of the practical implications of studying business information systems to first semester business students.

Methodology

In order to investigate the research question, literature concerning optimal use of video in management education was examined and combined with a qualitative case study (Eriksson and Kovalainen, 2008). The main literature offset was taken in Marx and Frost's (1998) *Towards Optimal use of Video in Management Education: examining the evidence*. The data for the qualitative case study was collected through fieldwork and focus group interviews. The fieldwork was conducted by the means of non-participant observations of a total of 12 oral exams in the course *IT in Business* in January 2013. The main focus during the observation of the oral exams was the students' ability to explain the practical implications of business information systems, as well as noticing if the video with the CIO was mentioned.

The focus group interviews took place in March 2013 and were semi-structured. The main topics concern in the interview were; a) The content of the video, b) the context in which the video was shown and worked with, c) the general use of video at university level, d) general methods of acquiring knowledge. The full interview guideline can be found in Annex A.

A total of 5 focus groups consisting of 2-4 people were interviewed. All students interviewed are enrolled in the Economics and Business Administration program at Aarhus University, Business and Social Sciences. The majority of the students interviewed in this case study were enrolled in the Danish version of the program (HA), however other nationalities were also represented in the study. The interviews were therefore both conducted in English and Danish. Each interview took about 40 minutes and were all digitally recorded and summarized in writing.

The focus group method was chosen as a mean to achieve synergistic effects through interaction among the participants. The participants in the focus group interviews were chosen based on a criterion sample. The criteria taken into consideration were; passing the exam in the course IT in Business and have seen the video with the CIO.

The focus group interviews were primarily concerned with the probing technique in order to acquire deep understanding of the subject matter; to investigate the students' perception towards optimal use of video in the specific case. The students were also asked to come with examples on how to optimize the use and were given time to discuss the questions in matter among each other.

After the introductory questions the students were shown the video once again. This was primarily done to brush up the students' memory of the video and thereby be able to engage in a better dialogue concerning its content and context.

The students were informed that the interviews were handled anonymously.

The profile of the study is primarily practically oriented within the area of using video to teach practical implications of studying business information systems. Thus, the findings are mainly oriented towards the practical domain. However, it also touches upon the theoretical domain of optimal video use within the field, but not the methodical domain.

Contextual background

The video in question in this study is used in the course IT in Business at Aarhus University, Business and Social Sciences. The course is just one of several courses in a three year business administration program consisting of a total of 180 ECTS points.

The main aim of the course is to give the students a deeper understanding of business information systems and the related management tasks it supports and revolves around.

The course is a 5 ECTS undergraduate course and consists of three main elements; 1) An introduction at practical level to an ERP system (SAP Business One), 2) Methods for formal modeling of processes, data and occurrences, 3) An introduction to a company's information systems and the relationship of these to business strategies. The course is taught based on lectures and tutorials. It consists of 10 lectures and 13 tutorials. The lectures take place in lecture halls and consist of up to 200 students. The tutorials take place in small class rooms consisting of up to 30 students and are taught by students teaching assistants.

During the course the students are to write two assignments which function as the foundation of an oral examination. This underlines the importance of understanding and being able to communicate the practical implications of studying business information systems. The first assignment is primarily concerned with the 2nd main element of the course and the second assignment is primarily concerned with the 3rd main element of the course.

The video with the CIO was introduced at the last lecture before working with the second assignment. There was a short affective orienting activity before watching the video, but no cognitive orienting activity. The students did not work with the video after they had seen it at the lecture. The video was not made available for the students to watch afterwards.

Theoretical background

The theoretical background of this study is based on the work conducted by Marx and Frost (1998). Based on studies from the educational media domain they attempt to understand the attributes and deficiencies of video as an instructional medium. The theoretical foundation of this study is based on Marx and Frost's proposed framework of learning activities that; "*incorporates the most beneficial*

aspects of video-based education while retaining the advantages of more traditional print-based teaching tools” (Marx and Frost, 1998)

Framework of learning activities – The video learning sequence

Marx and Frost (1998) describe an approach that combines video and printed learning materials for optimal educational outcome. They called this approach “The video learning sequence”. The authors called it; “...a promising approach to raising student interest, effort and content comprehension” (Marx and Frost, 1998, p. 249). The approach consists of three main activities:

- 1) The students are introduced to the content area first through basic readings
- 2) The students are instructed to view the selected video segment
- 3) Class exercises and advanced readings intended to solidify the impact of the video on learning objectives.

Regarding the first activity; Marx and Frost express the importance of acquiring a basic understating of the subject area through readings before viewing a video. The main advantage of using readings as the introductory activity is the stability of the printed word to the learner. This implies that the reader is controlling the rate of which the information is received. Thereby a leader with highly developed reading skills and/or high content familiarity can read selectively and scanning over sections that do not fit their purpose (Bazerman, 1985 in Marx and Frost, 1998). This also implies that the reader with poorer skills can adjust the pace accordingly.

Regarding the second activity; the theoretical framework describes the importance of affective and cognitive orienting activities before viewing a video segment. Affective orienting activities are concerned with the educator’s role of motivating student performance by heightening learner arousal of the video in question. This implies that learners need to know why they are watching a specific video in order to increase motivation. Cognitive orienting activities are activities that are used to facilitate understanding by stimulating cognitive structures (Hannafin and Hughes, 1986 in Marx and Frost 1998). This could imply that the educators inform learners about specific elements of the video learners should pay special attention to, or inform them of some main points they should know after watching the video in question.

Regarding the third activity; it is suggested to work with the content of the video in question in order to solidify and increase understanding of the subject matter. Advanced readings are suggested by Marx and Frost, but no additional learning activities are specifically mentioned. The learning sequence is primarily concerned with the importance of working more intensively with the subject matter subsequently.

When to use a video and when to use a book?

According to Marx and Frost (1998) books and articles work great for bringing learners from a basic to a moderate level of comprehension, where videos can cognitively engage them. This is due to a video's capability of generating interest in a subject matter and motivate the learners to dig deeper into its substance. In other words books work to generate foundational basic knowledge as suggested by the first activity in the video learning sequence, where a video works great as a motivational aspect to continue further and more advanced exploration of the subject matter in activity three. Additionally, video as a medium for learning is suggested to work well for content at a moderate level of complexity as well as for increasing the affective arousal and motivation to learn the content area in more detail. If a video is considered to have a too low or too high level of complexity, the learner attains lower rates of attention and thus lower comprehension. The theoretical framework examined does to suggest how to assign the level of complexity.

Analysis

When students were asked about their knowledge of the functioning of a CIO prior to watching the video for first time, most of them did not know what a CIO was doing and they considered the job very technical.

“I had no idea what a CIO was doing. I imagined that a CIO would be sort of an IT-nerd, but after having seen the video I understood that IT was not only a technical notion but rather mainly oriented towards how to strategically use IT in a company” (Student A)

Most students seem to have an understanding of the functioning of a CIO that is based on a stereotypical interpretation of an IT-nerd that is very technically oriented. Prior to watching the video most students had a very vague and misinterpret comprehension of the function. All of the students expressed deeper understanding of the function of a CIO after having watched the video. According to Marx and Frost's sequence of activities it is not clear if it has been necessary with a basic reading of the function of a CIO

before watching the video. None of the students expressed this concern. Whether or not it would have increased understanding is unclear.

When the students were asked about the affective and orienting activities before watching the video at the lecture they had a difficult time remembering. One group of students expressed that their educator, who had a good knowledge of the company represented in the video, presented the video well. They cannot remember if they were told why they should watch the video (affective orienting activity), but they suggested it would be a good idea to incorporate. They remember that they were not informed to pay attention to any specific elements of the video (cognitive orienting activity).

“We were not told to pay attention to any specific elements of the video, but I would consider it an effective way of sharpening our attention towards the video” (Student B)

Other students disagreed on the effectiveness of cognitive orienting activities.

“It could make us lose the overall impression and holism of the video if we were told special elements to pay special attention to. It would limit our attention to certain things and leave out the overall impression. It would instead be a good idea to be informed that we have to do some case-work or working with it in general afterwards. Then I would be more motivated to pay attention” (Student C)

All students agreed that affective orientating activities from an educator are of great importance before watching a video in order to increase motivation and awareness. On the other hand however, some students expressed that cognitive orienting activities could be too extensive and ruin the overall impression of the video by limiting their attention to specific elements.

When students were asked how they worked with the video after they had seen it, none of them expressed that they worked with it afterwards. Two groups of students expressed frustration that the video was shown to them just before the lecture ended, and that they barely finished it. Since these two groups of students did not work with the video at all afterwards, it implied that they quickly forgot the content.

“There was no work with the video afterwards. It was shown to us at the very end before we left the lecture hall. There should definitely have been some kind of wrapping of the content. We just watched it, left and forgot” (Student D)

Since none of the students worked with the video afterwards, neither at lectures or tutorials, they expressed that they quickly forgot its content and thereby considered it relatively irrelevant for the course. The video examined in this case study shows no compliance with activity three which helps solidify and comprehend the subject in matter, as suggested by Marx and Frost. This is considered a major concern that has negative effects both on motivation and comprehension for students studying the practical implications of business information systems.

When the students were asked how they would like to work with the video afterwards there were many ideas brought up. They mainly revolved around working with the video in smaller groups at a tutorial, since most of the students expressed that lectures do not function well for having a debate due to the class size.

“It would be nice if we went through the video at a tutorial again afterwards. It would be easier to talk, discuss and get deeper into the content of the video” (Student B)

Independently of each other several groups suggested to implement so called “clickers” at lectures to increase motivation and awareness. “Clickers are an interactive technology that enables instructors to pose questions to students and immediately collect and view the responses of the entire class” (Carnegie Mellon, 2013). The students have previously worked successfully with clickers in other classes and suggested that the course IT in Business implemented the solution.

“Clickers could be used very successfully, not only for the video, but for the entire course. It is very motivating and makes all of us more active at lectures. It should be used for all lectures in general. The clickers would be particularly useful if the video was stopped at different times and the professor asked us questions” (Student E)

Clickers seem to be a good method of keeping the students attention and motivation during a video sequence. They express it as both being fun and motivating. They do however only suggest that it is used for lectures, since tutorials are smaller and an engaging debate or presentation therefore works better in that setting.

When the students were asked to the advantages of books and videos respectively there was a clear pattern. They independently of each other considered books to be a better medium than video for

presenting theoretical content. Video on the other hand was considered a more appropriate media for presenting practical implications or examples of a subject matter.

“In my opinion, video is good to show what things are all about in a practical sense, where books are more insightful and therefore best for learning theory.” (Student F)

To sum up the students perception of the use of videos and books very briefly; books are perceived to be best for explaining theoretical concepts and videos are considered best for showing examples and practical implications of theoretical concepts.

When the students were asked about the trustworthiness of the video they were in general of the opinion that it was very high. This was primarily due to the fact that it was a highly respected CIO of a major Danish corporation that appeared in the video.

“Since it is an authority that appears in the video, it makes it more realistic, and makes me better to explain the theory in practice afterwards” (Student E)

As seen above many students did perceive the role and function of a CIO to be very technical. However, this opinion changes after having watched the video. The video was introduced to the students very late in the course. Since many of the students did not know what a CIO was doing before watching the video it could be considered introduced too late in the course. Many students did also suggest that the video or parts of the video should be introduced in the very beginning of the course. This was suggested in order to avoid the general misconception of the practical implications of studying business information systems that has been found present. As it has been previously shown by earlier research, the confusion of the importance and implications of the course led to a decrease in motivation for the students. Therefore it is suggested to show the students the practical implications of studying business information systems by the use of video as early as possible during a course in business information systems.

“I think that the video should have been shown in the beginning of the course to give insights in the usefulness of the course in practice, since many of us perceived the course as being very technical in the beginning” (Student G)

Lastly, the students did in general like the content of the video, but expressed that the sound quality could be improved upon since it was considered a little poor and therefore slightly distracting.

Findings

In relation to the framework of learning activities: The video in this case study did not to a sufficient degree correspond to the suggestions of optimal use as presented in the theoretical framework examined. The students were introduced through basic readings to the topic in question, which the theory examined also conclude to be optimal. However, the students did not experience a sufficient degree of affective and cognitive orienting activities before watching the video. This implies negative effects on the optimal level of motivation and comprehension of the content presented in the video. In relation to cognitive orienting activities some students expressed concern on pointing out too specifically what to pay attention to in the video. This was due to the concern of limiting the attention to certain aspects at the expense of the videos content as a whole. This finding is in slight contrast to the theoretical suggestion of high level of cognitive orienting activities and raises the question if a cognitive orienting activities can be too extensive. Lastly, the students did not experience any work with the video afterwards as suggested by literature, and expressed discontent on this regard. This led to both a decrease in motivation and perception of relevance. Most of the students suggested independently of each other to implement an online poll system or clickers as a positive way of working with video right after it has been shown at lectures. This suggestion was based on experience from current use of such system in another class and has led to increased motivation and activity during the lectures. In relation to the beneficial aspects of using video, the students agreed with the theory examined that it works well to increase affective arousal and motivation to learn the content area. Students also agreed and found video as a better medium than books for showing real life examples of theory as well as for teaching practical implications thereof. Additionally all students mentioned that books are more useful for learning theory and course curriculum than video since they can easier control the pace. This is also in line with the theory examined.

Additional findings outside of the theoretical framework of this study where. 1) the students find a video trustworthy when the practical implications of business information systems were explained by a high-positioned employee in a major corporation. 2) Some students suggested that video regarding the practical implications of studying business information systems should be introduced to them in the beginning of the course rather than in the end to increase motivation and comprehension for the course and its content. 3) Sound quality is considered an important aspect, since poor sound quality can be distracting.

Limitations and further studies

It is considered relevant to investigate a more contemporary literature base as the theoretical framework for further studies. The literature framework was not conducted specifically for the purpose to optimize the use of videos in teaching practical implications of business information systems but for management education in general. A limited number of interviews were conducted and a more extensive study would be of interest to generalize and increase the significance of our findings. Additionally the focus group interviews were conducted nearly three months after the students saw the video for the first time. This implies uncertainty regarding memory capabilities and thereby increases the uncertainty of the findings. Lastly, one of the interviewers was the teaching assistant for some of the students that were interviewed. This implies a possible bias in the answers provided, but it was not observed as being present during the interviews.

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Annex A - Question guide

INTRODUCTION:

- 1) Have you seen the video with CIO Torben Bonde?
- 2) Can you briefly describe what you remember from the video? What was it about?
- 3) Did you have a sense of what a CIO is doing before the video was shown?
 - a. If yes, did it give you any additional insights? - Which?
 - b. If no, did it help your understanding? How?
- 4) Did you have a sense of how IT and management functioned in practice before you watched the video?
 - a. If yes, did it give you any additional insights?
 - b. If no. Did it help your understanding? How?

****SHOW THE VIDEO****

CONTENT:

- 5) Which aspects of the video worked best for understanding?
 - a. Why?
- 6) Is it easy to understand and comprehend the content of the video?
 - a. What do you think about the level of complexity?
- 7) What are your thoughts regarding it being the CIO Torben Bonde in the video?
 - a. Do you think it adds credibility? How?
- 8) How was the length of the video?
 - a. Could you keep focused in the lecture hall when it was shown?
- 9) What do you think of the structure in the video?
 - a. Is it logically build?
- 10) How was the picture quality of the video?
- 11) How was the sound quality of the video?

CONTEXT:

- 12) Can you remember when the video was first shown to you?
 - a. If not: (Explain them when)
- 13) Was the videos introduced at the right time in the course?
 - a. If yes, why do you think so?
 - b. If no, was it too late or too early in the process?
- 14) What do you think of the introduction of the video at the lecture?
 - a. Was the orientation sufficient?
 - b. Was it explained why you had to see the video?
 - c. What was said?
 - d. How would you like this video to be introduced?
- 15) Did the lecture mention any specific aspect/elements of the video that you needed to pay special attention to?
 - a. If yes, which?
 - b. If no, do you think that would contribute in a positive or negative way? Why?
- 16) After having seen the video at the lecture – How did you work with it afterwards?
 - a. Did you have a debate after watching the video?
 - i. Did this debate work well?
 1. If yes, explain why?
 2. If no - why not?

3. How do you think you should work with this video afterwards to improve understanding?
- 17) What is your attitude towards working with this video again at a tutorial?
 - a. How would you like to work with in? Debate, case, presentation?
- 18) Do you think it is necessary to work with it at a tutorial?

THE FURTHER USE OF THE VIDEO

- 19) What do you think of the availability of the video after you saw it!?
- 20) How did the video help you to write Assignment B?
 - a. How useful was the video in terms of writing and comprehending the content of Assignment B?
 - b. If used – which elements did you especially included?
 - c. If not used – why didn't you use it?
- 21) Do you think the video made it easier to understand to transition from Assignment A to Assignment B?
 - a. Did it help you to understand the connection between strategy and management after modeling?
 - b. How?
- 22) Can you recognize some of the theory presented in lectures and in the book, that you have seen Torben Bonde talking about in practice in the video?
 - a. Which?
- 23) Does the video support what you have worked with in the course?

METHODS OF ACQUIRING KNOWLEDGE IN GENERAL

- 24) Have you via the book been able to obtain knowledge regarding IT and Management?
 - a. How?
 - b. If not, how have you tried to obtain knowledge regarding IT and management?
- 25) Do you prefer to watch videos or to read books when acquiring knowledge in the course IT in Business?
 - a. Do you think it is easy to process knowledge from a video compared to books?
- 26) Do you think the course IT in Business at Aarhus University, BSS is modern in its educational methods?
 - a. If no, why not?
 - b. How can it become more modern?
 - c. How would you be more motivated?