

Experiences with Multimedia based Case Studies

Ewald Jarz

FH KufsteinTirol – University of Applied Sciences Kufstein

Key words: *Multimedia, Case Study, experiences, business process, learning by doing*

Abstract:

This paper shows the experiences made with a multimedia based case study in academic education. The case study has been used within three courses of business process engineering. It was compared to a case study based solely on text. 13 assumptions have been evaluated. The main conclusion is that the multimedia based case study is much more practice oriented than a text based case study. Also the solutions of the students, which did the multimedia based case study, have been of higher quality. But on the other hand the expectations of the students to a multimedia based system are hard to meet.

Based on these experiences some hints in further developing of multimedia based case studies are formulated.

1 Initial Situation

The education in business informatics at academic level contains business process engineering. The objective is to model the business processes of organizations. While building the model of such processes it is necessary to analyze and understand the processes and to transform them into a model language as e.g. UML or event-process-chains. The main problem in this specific field of education is that a lot of practical training is needed to get good results. The typical situation in practice is to interview persons and write down their statements. Training this situation in an educational field is not easy, because it is seldom that an organization supports a practical project where students can interview real persons. Therefore case-studies are used. But the problem of case studies based on text is that an important abstraction process (from interviews to written text) has been done yet.

In 1995 we started experimenting with multimedia based case studies in education [1]. In 2004 this case study has been ported to a web-based application. Since then three courses in business process engineering have been held and evaluated.

2 The Multimedia based Case Study

The original case study emerged from a project with a regional airline. The idea is that students are trained in analyzing and designing IT-systems before they use the learned methods and techniques in practical projects. The complexity of a business informatics project consists also in the problem of communication with users and principals. A big challenge is especially to build a big picture out of a lot of single information of divers persons. This process is hard to support in traditional case studies based solely on text. In the multimedia based case study it is possible to navigate in a structure chart of the company to a virtual person. At this position there are some questions for the students available, which they can ask. The questions will be answered by the virtual person in a video clip. Each answer contains just short information chunks and sometimes a link to other persons (information link). The student has to develop a big picture like in a puzzle. Additionally there

are some documents at each person in electronically form (e.g. a document in pdf-format or a scan of a real document) available. Also the technical equipment of the working environment is available (see Figure 1).

The screenshot shows a web-based interface for a case study. At the top, there is a header with the 'fhs Kufstein Tirol' logo, the title 'Fallstudie TYROLEAN', and the slogan 'Studium mit Zukunft'. Below the header is a navigation menu on the left with the following categories: Director (DD), Operation (DD) (with sub-items: Dispatch (DOD), Roster (DOR), Pilot (DOP), Flight Attendant (DOF), Catering (DOC)), Technik (DT) (with sub-items: Planung (DTP), Maintenance (DTM)), Marketing (DM) (with sub-items: Marktforschung (DMF), Ground (DMG), Reservation (DMR)), Economics (DE) (with sub-items: Finance (DEF), Verkehrsbuchhaltung (DEV), Controlling (DEC), Administration (DEA)), and Glossar. The main content area is divided into three sections. The left section contains a list of interview questions: 'Was sind die häufigsten Reklamationen?', 'Was tun Sie, wenn ein Passagier reklamiert?', 'Wofür verwenden Sie den Daily Ops?', 'Was tun Sie mit dem SDL von DOD?', 'Was passiert beim Check-In?', 'Wozu wiegen Sie das Gepäck ab?', 'Wie kommen Sie zum LTS bei Flügen von anderen Flughäfen?', 'Wer betreut die Passagiere?', and 'Wie erstellen Sie das Load and Trim-Sheet?'. The right section features a video clip of a woman, identified as 'DMG - Ground Pleschberger'. Below the video is a table with two columns: 'Dokumente' and 'technische Ausstattung'. The 'Dokumente' column lists: 'Load & Trim Sheet', 'Passenger & Baggage Sheet', 'Cargo Manifest (NIL)', 'SITA Telex DTM', and 'Flugticket IATA'. The 'technische Ausstattung' column lists: 'SITA - Telex', 'PC', 'Travi-Austria', and 'Allgemein'.

Figure 1: Screenshot of the multimedia based case study

The case study should be done in teams of two or three students. The task can be various. Either the students have to analyze the business processes and model them with techniques and utilities of business informatics and show weaknesses and do some suggestions to improve the situation. Or there are some part of solutions available (e.g. as a document at the CEO-position) and the students have to develop an informatics strategy and so on. According to the unfamiliar processes and terms in the branch of an airline the task is not easy to solve and adequate complex. The case study had been enabled through collaboration of original co-workers of the company, who worked as interview partners in their spare-time. We recorded 112 single clips (most of them took us a lot of takes), which are available in the study.

The study is available on CD-ROM and via Internet [2].

3 Theses and Facts of the Evaluation

Before evaluating the study 13 theses had been formulated, based upon the experience from former usage:

1. The overall impression of this kind of case study is positive
2. The multimedia based case study is better than a case study based solely on text.
3. The kind of information representation with multimedia supports the playful learning.
4. The application is more used from CD-ROM and not via Web because of the large video clip files.
5. The multimedia based case study is more practice oriented than a text-based case study.
6. The multimedia based case study wakes the interest on the topic of business processes

7. The multimedia based case study supports the understanding for the specific problems in business process modelling.
8. The multimedia based case study supports the learning of business process modelling well.
9. Due to the pre-formulated questions the students feel restricted.
10. Due to the pre-formulated questions the students feel artificial lead to the solution. The “aha-effect” is missing.
11. Contradictions would make the multimedia based case study more realistic.
12. The case study is demanding
13. If there would be costs for the information chunks (e.g. points), the case study would be more realistic, because the students had to work more structured.

The students did a text-based case study to a different case before they did the multimedia based case study. Therefore they had already experience in doing case studies and could compare them.

According to this theses a questionnaire had been developed to check the theses. Each question could be answered on a scale from 1 to 5 like school grades. A “not answerable” rubric has also been available. Additionally the students had the ability to answer three open questions in plain text:

- What did you like most?
- What did you like least?
- Other suggestions.

After the course the questionnaire had been filled out from the students. The three courses had the amount of 21, 27 and 25 Students, a total sample size of 73. There have been no major significant differences between the samples of the three courses. The standard deviation (in percent points) for each grade within each question (Q1 to Q13) and between the courses is shown in figure 2.

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13
Grade	σ	σ	σ	σ	σ	σ	σ	σ	σ	σ	σ	σ	σ
1	0,3	10,8	1,1	2,9	10,6	1,6	1,1	2,4	9,5	3,2	1,6	8,2	14,0
2	12,4	2,6	0,3	3,7	9,0	3,4	8,7	6,1	9,8	6,1	9,8	3,4	0,8
3	9,3	3,4	0,5	1,3	3,2	1,6	12,4	0,3	3,2	8,5	2,6	10,3	10,1
4	3,4	14,3	0,5	6,9	2,4	0,3	4,8	5,3	4,8	7,4	6,3	2,1	4,0
5	0,0	2,6	1,6	14,8	2,4	0,0	0,0	0,0	1,9	1,9	2,4	3,4	1,1
t-test	1,00	1,00	0,93	1,00	1,00	1,00	1,00	0,94	1,00	1,00	1,00	1,00	0,92

Figure 2: standard deviation and t-test result for each grade and within each question between the courses

4 Evaluation of the Theses

The detailed results of the questioning are shown in Figure 3 to Figure 15.

Theses 1 (overall impression is good) could not be falsified. Over two-thirds of the students classified the work with the multimedia based case study with “very good” or “good”.

Theses 2 (multimedia based case study is better than a text based study) could also not be falsified. Only one third of the students preferred the text based case study.

1. How did you like the work with the multimedia based case study over all?

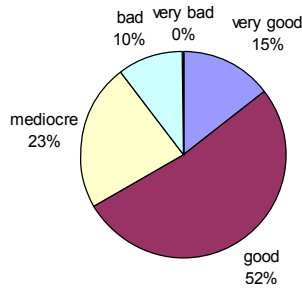


Figure 3

2. Would you prefer the multimedia based case study instead of a solely text-based case study?

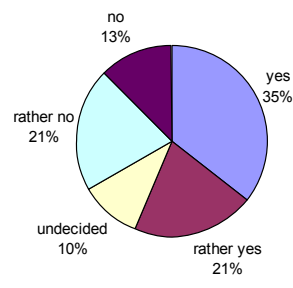


Figure 4

For these 3 (playful learning) there are strong hints for a falsification. Only a fourth of the students complained to working with the multimedia based case study is like a game with “yes” or “rather yes”.

Theses 4 (multimedia based applications are still more used local) could also not be falsified. Only 30 % used more the online version. Perhaps this is because of the large video files.

3. Did the multimedia based case study remind you on a gaming situation?

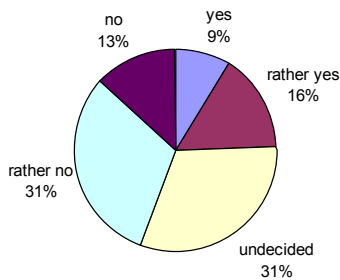


Figure 5

4. Did you use the multimedia based case study more from CD-ROM than from the web?

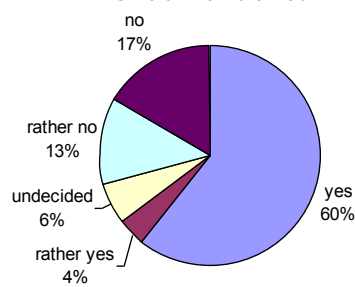


Figure 6

Theses 5 (multimedia based case study is more practice oriented) could also not be falsified. Only 4 % negotiated this statement. Additionally the most statements from the open “what did you like most” question came up with “practice oriented” or “very practice oriented”. It seems that the multimedia based case study is much more practice oriented than a solely text based one.

5. Is the multimedia based case study more practice oriented than a solely text-based case study?

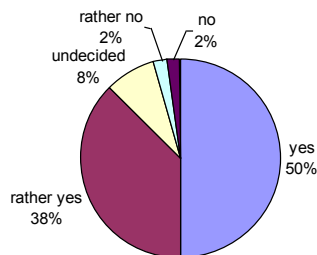


Figure 7

6. Has the work with the multimedia based case study raised your interest on the topic of business process modeling?

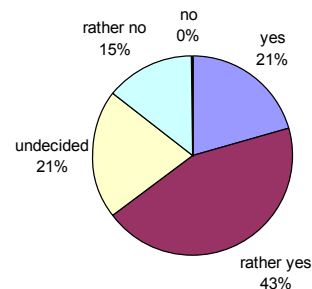


Figure 8

7. Did the work with the multimedia based case study support your understanding for the problem of business process modelling?

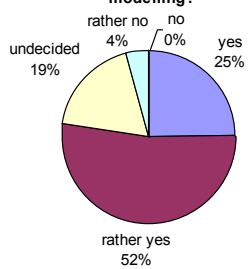


Figure 9

8. Would you like to do a multimedia based case study again?

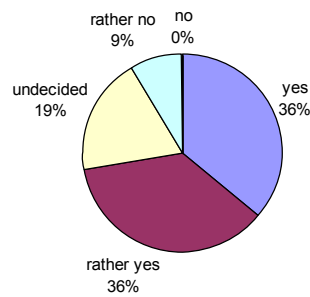


Figure 10

Theses 6 (wakes the interest in business process modelling), theses 7 (supports the understanding) and theses 8 (supports the learning) could not be falsified. Merely 15 % said that their interest had rather not been raised while doing the study. And even only 4 % said that they didn't get more understanding while doing this study. The resulting solutions of the students have been also very good. A nice indicator that the use of multimedia based case studies in this field is very useful.

Theses 9 (restriction because of pre-formulated questions) could also not be falsified. Only 6% did not like to ask more or other questions to the virtual interview partners than offered. Overwhelming 86 % wanted to have the possibility to ask more or other questions than offered. That means that further research in this field has to be done and a new version with generated answers should be developed. This ambitious task can only be solved with a broad research cooperation of researchers in animated 3-D, automated text-tagging, semantic-syntactic translation, and know-how-management.

For theses 10 (missing "aha-effect") there is surprisingly a weak hint for falsification. 39 % agreed to the position, that the pre-formulated questions led to hints to the processes that should be analyzed. 27 % disagreed and 34 % were undecided. Perhaps this happens because most of the students clicked the answers more than once, to get the correct information out of the video clip. And therefore they heard the keywords anyway.

9. Had you liked to ask your virtual interview person other respective some more questions than the pre-formulated ones?

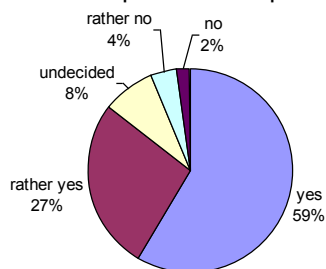


Figure 11

10. Did the pre-formulated questions anticipate hints to business processes?

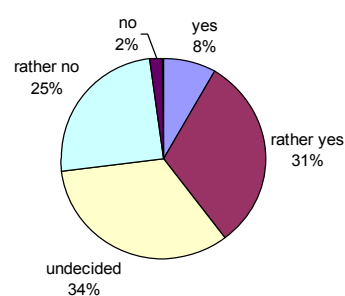


Figure 12

Theses 11 (contradictions are more realistic) could not be falsified. Only 19 % disagreed with "rather no" or "no". But on the other hand they didn't like to have such a realistic situation with controversial information for the purpose of learning: Only 42 % agreed with "yes" or "rather yes" to this position.

Theses 12 (multimedia based case study is demanding) was not explicit asked. But in the open questions came out that the effort the students had to do was quite high. So these theses could also not be falsified.

11. Would the multimedia based case study be more realistic by putting in some contradictions?

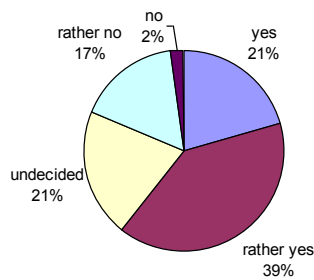


Figure 13

12. Would you like to have such contradictory information for learning?

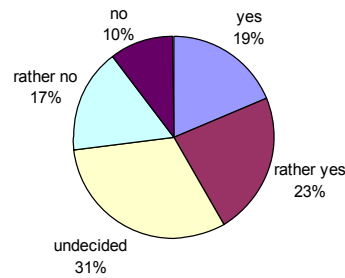


Figure 14

For theses 13 (more structured approach when having costs for information chunks) there is a very weak hint for falsification. 29 % disagreed with “no” or “rather no” the statement, that they would have been more structured in doing the multimedia based case study if there had been costs for each information they had clicked. But empirical data (as e.g. process time) is still missing to falsify this theses. Further research has to be done in this case too.

13. Would you have been more structured in your analysis process if there had been costs for each information chunk?

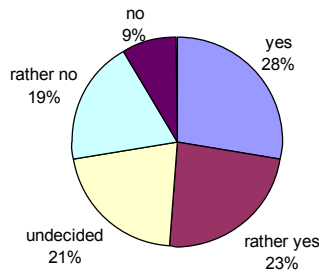


Figure 15

The feedback in the open questions showed that the student’s expectations to the multimedia based case study are hard to meet. The quality of the video-clips, the sound and picture quality have been criticized. They are used to professional clips like in TV, video games and so on. Therefore a multimedia based case study has to be developed in a professional surrounding – and this is expensive [3].

5 Personal Feedback

The personal feedback from the students and the impressions during their work with the system has been quite positive. They liked the different way of learning and the possibility to look inside a very well known company in Tyrol. Also the motivation in the teams has been high. Sticking together, working something out together, learning how to understand and modelling unfamiliar processes have been the most important factors for this. It could be seen that they were sitting in the interview situation and splitting up their work – one noticed the statements, another one drew an UML diagram. They also were surprised about the complexity and difficulties in an organization.

They didn’t like that the video clips couldn’t be paused during the playback, because they have not been able to write all the information down in real-time and so they often had to click one clip twice or more. But that was intended, because that’s close to the situation in real life. Another discussed point was the difficulty of the task. It was not easy for the students to find out and model the business processes correctly because it was the first time they did a very complex modelling for a whole company.

6 Conclusion and Outlook

Using multimedia based case studies in education especially for business process analyzing and modelling is very useful and supports understanding of and interest in the topic.

Multimedia based case studies seem to be more practice oriented than case studies based solely on text. Surprisingly a multimedia based case study does not remind the students to a gaming situation. It seems to be not a playful-learning-situation. Students liked to work with this kind of study and regardless of the restrictions in this case (only pre-defined questions, no information costs, no contradictory information) it is a nice application to train practical situations.

For further development of this multimedia based case study a lot of research has to be done. The possibility of presenting generated answers to avoid pre-defined questions has to be checked out and implementing information costs should also be evaluated.

References:

- [1] JARZ, Ewald; KAINZ, Gerhard; WALPOTH, Gerhard: Multimedia-based Case Studies in Education. Design, Development and Evaluation of Multimedia-based Case Studies. In: AACE [Ed.]: Journal of Educational Multimedia and Hypermedia (JEMH) Nr. 6 (1996)
- [2] JARZ, Ewald: Tyrolean Fallstudie, http://www.fh-kufstein.ac.at/wi/ejarz/TyroleanWeb/Tyr_index.htm, 15/04/2006
- [3] JARZ, Ewald: Multimedia Contents and their Ability of Representation. In: MApEC [Ed.]: Multimedia Applications in Education Conference (2004), p. 34 – 41

Author:

Mr. Ewald, Jarz, Dr. Mag.

FH KufsteinTirol, University of Applied Sciences, business informatics degree program

Andreas Hofer Str. 7

+43 5372 71819 171

Ewald.jarz@fh-kufstein.ac.at

Author(s) short biography (biographies):

Born in 1965 in Tyrol/Austria. 1984 graduated at a technical high school of electrical engineering, 1989 master exam of export management, 1992 Master of Economic and Social Sciences and 1996 Doctor of Economic and Social Sciences (University of Innsbruck). 1992-1997 scientific assistant at the Department of Business Informatics. 1998 - 1999 executive director of a seed financing venture fund. 2000 executive director of a start-up company. 2001 to 2002 scientific researcher at the department of Value Process Management and since 2002 director of studies of business informatics at the University of Applied Sciences in Kufstein. Lecturer at many educational institutions, listed in Hübner's "Who is Who in Austria", Marquis "Who's Who in the World" and Marquis "20.000 outstanding People of the 20th Century".