Developing Production-Oriented, Problem-Based and Project-Work Courses - The Case of Game Development in a Video Conference Setting

Henrik Schoenau-Fog(✉), Lise Busk Kofoed, Nanna Svarre Kristensen, and Lars Reng

Aalborg University, Copenhagen, Copenhagen, Denmark
{hsf, lk, nsk, lre}@create.aau.dk

Abstract. There is a growing need to develop new types of learning environments using different kinds of digital support to improve learning. Aalborg University which is based on problem based learning (PBL), has for several years tried to rethink the traditional courses to optimize and enhance the quality of the learning processes, e.g. when using video conference systems (VCS). In order to develop a new format of VCS courses we have used the course "Theory and Practice of Game Design and Development" as a foundation for experimenting with a new structure based on blended synchronous learning environments. This paper will introduce the learning environment concept of this course, the structure and students' opinions of the new course concept and structure using VCS.

Keywords: Theory and development of games · Video conference teaching
Playcentric approach · Problem based learning · Production-oriented learning
Design based learning

1 Introduction

In many universities, there is a strong focus on establishing new learning environments using digital support to improve the learning process. Aalborg University (AAU) has as a Problem Based Learning (PBL) university for several years tried to rethink the traditional courses to optimize teaching resources and enhance the quality of the learning processes, e.g. flipped classroom pedagogy, integration of Massive Open Online Courses (MOOCs), ICT tools for communication, Google drive/docs, Moodle and video conference systems (VCS). AAU is spread over three campuses, located in three regions in Denmark, and some of the programs are located on two or three campuses having the same curriculum e.g. at Medialogy (The Study Board for Media Technology 2017). When a course has to be carried out in two or three campuses, there has been a need to optimize the teacher resources in a way so courses could be running simultaneously using VCS.

There are only limited experiences using VCS in classes with more than 60 students e.g. divided into two classes. However, there are studies indicating some major

A. L. Brooks et al. (Eds.): ArtsIT 2018/DLI 2018, LNICST 265, pp. 363–373, 2019.
https://doi.org/10.1007/978-3-030-06134-0_40

problems using VCS (Brower et al. 2015). One of the main problems seems to be connected to existing VCS technology (Irvine et al. 2013). Another problem is the physical learning environments that are not properly designed as VCS learning environments (Park and Bonk 2007). Finally, it can be very difficult to keep the students motivated when the teacher is not present in the same location as the students (Bower et al. 2015).

In order to overcome the above-mentioned problems, we have developed a new format using VCS on the 5 ECTS elective course "Theory and Practice of Game Design and Development" (a 6th semester course at Medialogy, Aalborg University) as a foundation for experimenting with a new course structure.

There is already various literature on courses in a game-based learning environment (Schoenau-Fog et al. 2018), however there are less studies of game based learning courses using VCS learning environments (Timcenko et al. 2017). The combination of teaching in a Game Production-Oriented, Problem-Based and Project-organized approach using VCS seems to be a challenge for both teachers and students. This challenge we wanted to address by developing a VCS university course in production-oriented game development including the basis of theories and literature on game development. In 2018, the course had to run on two campuses simultaneously with 82 students (in 2017 it ran on three campuses with over 120 students). Our aim was to use VCS in a way so students would get the necessary hands-on experience together with the theoretical knowledge and at the same time keeping students' motivations high. In this paper, we present the theoretical and pedagogical background of the new course, the description of the course, the experiences and results as well as a conclusion with future perspectives.

2 Pedagogic Approach: A Blended Synchronous Learning Environment

When designing a university course with a focus on both the theoretical part but also the practical design and development of games, we are using various pedagogical approaches and theories. The pedagogical background is based on AAU's approach of Problem Based Learning and project organized group work (PBL) (Askehave et al. 2015). In order to establish a new course using VCS we will integrate experiences from a design-based learning approach founded on a production-oriented game development (Schønau-Fog et al. 2015). The design based approach has shown successful results for students developing skills and understanding, when they needed to undertake solutions of complex and sometime ill-structured problems (Ke 2013). According to theories of problem-based learning and situated learning, designing creates contextualized and authentic learning, because design tasks force students to understand and work in an environment that demands skills and domain knowledge close to real work environment (Savin-Baden 2014), and it fit very well with the PBL approach. Digital game *development* has furthermore been considered and examined as a "powerful learning environment" to stimulate active, autonomous learning via rich contexts and authentic tasks of composition and construction (Robertson and Howells 2008; Schoenau-Fog et al. 2018).

However, there is a need to develop experience in how to integrate the VCS in practical course design such as in the game production course. The students at the 6th semester have not yet any experience using VCS in a course, but are familiar with the Moodle platform, Flipped Classroom, and to some kind of Blended Learning activities as well as project organized teamwork (Reng and Kofoed 2016). Blended learning has various definitions. In a study (Finn and Bucceri 2004) it is defined as the combination of the best features of traditional learning and online learning. According to Skylar (2009) blended learning environments integrate the advantage of e-learning methods with traditional learning methods such as face-to-face (F2F) interaction. However, the definition has evolved to encompass combinations of various models to combine F2F education and online education in an efficient way in which students can engage in interactive experiences (Bower et al. 2015). Blended synchronous learning approaches might be a solution where one course has to run simultaneously in two campuses.

We thus define blended synchronous learning as *Learning and teaching combining F2F teaching with online possibilities for students to engage in interactive learning experiences where remote students participate in F2F classes by means of media-rich synchronous technologies such as video conference systems*.

Evidence from several studies find that blended synchronous learning can lead both groups of students to attain similar learning outcomes (Szeto 2014) and to develop a similar sense of community (Atweh et al. 2005). Creating an enhanced sense of community among both F2F students and remote students might be one of the main educational advantages of blended synchronous learning (Lidstone and Shield 2010). It has been claimed that students in a blended synchronous learning interventions experience high level of social presence (Garrison et al. 2000) which might partially be because of immediacy that real-time communication offers and the spontaneous nature of interaction and feedback (Cunningham 2014). However, several studies also argue that social and emotional connectedness cannot be taken for granted. It has to be actively encouraged and supported by teachers in a blended synchronous learning environment (Butz et al. 2014; Szeto and Cheng 2014).

The design of the course has to consider the organization of the course plan to combine a fair share of F2F teaching for the two classes, planning the hands-on work, planning the assignments, students' presentation of their games, giving feedback. Finally, the teachers have to find a strategy how to present and act in front of the camera(s) so both the remote and present students get the sense of being part of the same course.

3 Methods and Data Collection

Before conducting a larger scale implementation, we found it essential to test the course using VCS. A pilot of the course was launched in 2016 and a full course was implemented and rolled out simultaneous at three campuses in 2017. The experiences from those courses have given valuable knowledge and ideas, which has been the basis for the course presented in this paper. Furthermore, the 2018 course have developed during the process as a developing experiment with several reflection loops during the process. We have used an explorative case approach (Stebbins 2001; Remenyi 2013) in

combination with a descriptive, mixed-method study (Stake 1995; Yin 2008) to investigate especially students' experiences. In 2018, the course took place simultaneously in two campuses: Aalborg and Copenhagen. The parameters of the study are reflected in a student survey questionnaire (with qualitative and quantitative questions) and are elaborated in interviews. Researchers not involved in the course have made six observations of the course, conducting content analysis of the observation data supplemented with the findings from students' survey, and weekly feedback sessions with the students. The hand-in frequency of assignments, the exam and students' final game production have also been analyzed. This study addressed the following research questions:

(1) How was the course of Theory and Practice of Game Design and Development structured and organized?
(2) How did the blended synchronous learning environment function?
(3) How did students experience their learning process?
(4) What was the student's final exam/learning results?

4 Overview of the Course Concept

In this chapter, we will introduce the curriculum of the course content and the learning environment concept.

4.1 Course Content and Curriculum

The study plan curriculum describes the course as an activity, which "[…] provides students with the knowledge and skills required to use game design and development theories to design, prototype, develop, playtest and evaluate games and game-like media experiences" (The Study Board for Media Technology 2017). We designed the course with a focus on practical design and development of games, however, we also made sure that students would be introduced to the literature and that they had to revisit it to solve the weekly assignments at the workshops, during the course.

4.2 The Learning Environment Concept

In order to use the curriculum above as a foundation to create a blended synchronous learning environment, where students from several campuses were motivated and involved through video conference and online tools, we needed to develop a novel way to organize the course.

Based on the former experiences (the 2016 pilot and the 2017 roll-out), we were inspired to make a more efficient course, while still maintaining motivation among students.

In 2018, we thus decided to minimize the use of lecturing through VCS, and instead use the system as a communication tool, to give introductions in the mornings of each course day, and then make follow ups and afternoon kick-offs before lunch. This also helped to establish a community across campuses.

The teacher role thus changed from being a lecturer to a course "facilitator", where the main task was to make sure that the learning was organized in a way so that students learned the practical aspects of the course (to conceptualize, develop and playtest a game) as well as the theoretical content of the main course literature. Table 1 is showing the structure of the learning environment concept

Table 1. The learning environment concept

VCS kick-offs, status and lectures: - Short face-to-face VCS morning kick-offs, with inspirational short videos (e.g. examples of innovative games), feedback from students and planning the next steps. - Plan of the day introduced at the VCS kick-off and always available and updated on Moodle (a learning management system). - In the beginning of the course, a few brief sum-up/status, VCS meetings with both campuses before lunch and at the end of the day. - A few short one hour VCS lectures with additional "inspirational" topics, new ideas, literature and guest lecturers. **Assignments:** - Assignments formulated as challenges which were part of the stages of the development of the games (e.g. paper prototypes) - Assignments uploaded to Moodle and gamified as "Experience Points" (XP), counting 5% of the final grade. - Assignments uploaded to common online Google Drive portfolio (visible to all students) **Conceptualizing, Designing and Developing the game:** - Hands-on work with assistance from TAs and mentoring from course teachers. - A lot of brainstorming, practical prototyping and playtesting. **Evaluation, Feedback and Exam:** - A mandatory final "PlayDay" game festival, where teachers, teaching assistants and all students had the opportunity to watch presentations, teaser videos and play the games while giving feedback. - The written exam hand-in included questions, where students should individually reflect, evaluate and grade their own games with arguments based on the main literature (with deep references to page numbers) **Digital tools:** - The VCS was a generic solution developed for AAU. - Moodle was used to organize preparations, plans for the days, assignments and communication with all involved - Google Drive was used for the main online portfolio with links to hand-in assignments, playable prototypes etc. - YouTube was used for game teaser videos, which were presented at the final PlayDay.

Based on the curriculum, we designed the course to consist of 9 full days (spread over the months February to April) with VCS introductions in the mornings, assignments, design and development during the rest of the days. In addition to this, students needed to prepare for the course days, and develop a final game.

5 Experiences and Results

The blended synchronous learning environment has been the framework of teaching and learning, and below the students' experiences of how this structure worked in practice are presented. Observations were conducted during the course from campus

Copenhagen in both lecture time and while students have been working on exercises/producing their game in their groups. Thereby the observations gave insight into students' practice of working problem based and product-oriented in their team work. Furthermore, the observations have shown the challenges for the lecturers using VCS, while they were lecturing and facilitating game based learning in F2F and remote classes.

The findings are based on the overall question: How has the structure of the course as a blended synchronous learning environment worked?

5.1 How Did VCS Affect the Teaching and Learning Opportunities?

In the following, we present the students opinion on VCS. Compared with the 2017 course, where the VCS did not work optimally half of the time, the 2018 course had the benefit of the system working better. 70% of the students didn't find VCS directly destructive for their learning, but still 30% of the students indicate that the course would have been much better without the use of VCS (N = 54, out of 82 attending the course). This feedback show that there are still problems using VCS though observations show that there were no technical problems related to the VCS and no unexpected interruptions in the lecturing, kick-offs, status and feedback done using VCS at both campuses.

The observations also showed that the students were concentrated when the lecturing was transmitted from Aalborg and students in Copenhagen were remote. The setting of the video transmission was zoomed on the teacher which gave a high degree of visual connection to the teacher for both groups. However, some problems related to the physical setup were observed. The setup and the teachers' use of the screens is very important for the communication among the teacher and the two groups of students. The setup was made with two screens in Aalborg; one showing the video transmission of the lecturer (if he was in Copenhagen), the other showing the online elements such as Google docs (which students could update synchronously from both campuses), Power Point slides etc. In Copenhagen, there were two screens; one with the online elements presentations and one in the back end of the classroom showing the students in Aalborg. This setting made communication possible between the teacher and the remote students, but there were some problems, both in the teacher-remote student's interaction and in the student-student interaction between campuses. The observation of a student presentation in Aalborg show how this in practice became a problem:

The students in Copenhagen are facing the front screen they have been using during the lecture and do not turn their view to see the students in Aalborg presenting, but they hear them from the speakers and look ahead. Another situation is to stay within the camera's recording view when presenting their work.

After the presentation, the students in Aalborg have moved away from the camera but are still connected via the sound system. If a teacher or student want to communicate with the presenting group, they can hear but not see them (because they walked away from the view of the camera after the presentation).

The physical limitations of both communicating to a camera that might not catch the interaction because people move around, and the physical setting of the transmitting screen creates barriers for communication. This problem was mostly seen under student

presentations while the more traditional lecture time was not affected by these barriers. This also affects the opportunities for working problem- and project based while using VCS. The pedagogical strategy of active learning is thus limited because of the communication and interaction barriers. The setting of the VCS limits the student-student activities between the two campuses because they cannot see each other, and activities between teacher and remote student become troubled when students move in and out of the camera view. Those problems can be solved with another screen setup, but it was also experienced that the use of teaching assistants became very important as long as the current VCS screen set-up was not changed. Teaching assistants (TA's) usually are a valuable resource to help students while doing exercises and working "hands on" with their problems. The TA's at this course also had another important role, they were technical support for the remote students and they made it possible to zoom, change video settings and create the light settings so the remote student could follow the transmitted teaching. In the survey, 53% answered that support from the TA's was needed during the development of the game, while 17% did not need help and 30% were indifferent which confirm that TA's support is a valuable asset in blended synchronous learning.

5.2 How Did the Facilitation and Communication on Google Drive Affect the Teaching and Learning Opportunities?

The use of Google Drive became a facilitation platform for the teacher to interact with the students in an equal way no matter if the student were F2F or remote. The teacher used a Google Doc for choosing group presentations from the online portfolio made in the group work time. The student presentations (Google Slides) were shown on the screen in both campus. The students did then present and discuss what they had been working on and the teacher could give instant feedback. The students were confident about using Google Drive tools and they did not use a lot of time around the platform. The students from the two campuses alternately presented their work (assignments etc.), and the teacher facilitated the presentations. Thereby the students were activated equally and were given feedback on their own material to their continuous work. This gave opportunities for the student-centered learning using elements from problem based and project organized learning.

5.3 How Did the Structure of Exercises and Production-Oriented Work in a PBL Environment Affect the Teaching and Learning Opportunities?

The lecture time is one thing in the course, but most of the time were - as mentioned in the above description - given for the students to work "hands on" with the production of their game in the group-rooms, where there was more space than in the lecture room. This production-based learning in the groups own workspace showed a motivated and engaged work effort. Survey data shows that 81% of the students found that the course made them more motivated for learning technical topics such as programming, and 57% of the students become more motivated to continue studying at the Medialogy Master.

The group work observations also showed that students used their experience from PBL work methods. While the students gathered around tables and whiteboards creating a physical playground they also created the non-physical rules, modus and narrative characters. Theoretical and complex work were slowly developed in a constructive discussion using both theories and methods learned in the course.

We experienced that students were both working together in the complexity of power and solidarity and working problem-oriented to solve the continuing problems that they run into when creating and deciding on a whole game design. When working with physical products the visual development seems to provide the basis for working problem-oriented. The visual "argument" (understood as physical movements of play objects or drawings) for a problem or a solution in creating the game, gives all in the group the same visual foundations to understand and solve the problem. The product-oriented learning environment thereby create the opportunities to work problem oriented from a visual and physical framework that are equal for the group. In the future, it could be interesting to experiment with the visual argument approach in a VCS setting.

5.4 How Did Students Perform at the Final Exam?

At the final presentation of the group's games - the "PlayDay" - it was observed that students were very motivated to show off their games. In 2017, groups only showed a video of their games, but according to negative feedback this was changed in 2018, so that teachers, teaching assistants and all teams had the opportunity to play each other's games and give feedback.

According to the survey (N = 54), 95% of students agreed that the PlayDay was a good event, and 60% agreed that they acquired new knowledge at the day, while 78% became more motivated to make their game better due to the PlayDay.

At the exam, the students handed in their playable games (40% of the grade), a report with answers to theoretical questions (50% of the grade), an extra assignment (5% of the grade), and finally the quality and quantity of the handed-in "experience-point" assignments were used for the last 5% of the grade. The resulting games turned out to be of a high standard, and it was obvious that students had used the course content and theories to make unique and engaging games. At the Aalborg campus (where the lecturers only visited three times) the games had a bit higher quality than in Copenhagen. A major reason for this might be that all groups in Aalborg had good programmers on board, and that the TA was very dedicated and invested time during development of the games.

Over 90% of the non-mandatory Experience-Point ("XP") assignments were handed in on Moodle. On other courses, this rate is usually much less, so it might have been due to the "gamified" concept that the amount/quality of the handed-in assignments was high. The "XP" system thus seems to work when motivating students to hand in their assignments, even though students were not "forced" to hand in.

All students, who signed up, passed the exam and many of the written hand-ins were of a high quality. All students used the main course literature, and the best students had up to 80 deep references to exact page numbers in the literature. We have tried to create an exam format, which motivates students to go deeper into the literature; because they need to understand, the theories before they can critical evaluate their own game.

6 Discussion

The experiences with the practical/theoretical production-oriented blended synchronous learning environment has shown that it is challenging to use VCS for teaching a practical oriented course for students in two campuses. However, the concept with short kickoffs, plans on Moodle, shared documents on Google Drive, assignments and teaching assistants has proven to work for both teachers and students – but with some technical adjustments of physical environments. The teachers and students has to be introduced in the staging and choreography connected to using VCS in the specific physical environments. The VCS creates some barriers for students discussions across campuses, but working with Google Drive to facilitate student centered presentations and working problem oriented in groups on the hands - on exercises that activates students learning process. Furthermore, the PBL experience of the (6th semester) students might have helped them a lot during the implementation and assignment during the different parts of the course.

This course can be effectively used in students' semester PBL projects, since it almost gives the perfect plan for working on the design and implementation for their project (but with no demands of formulating a problem). The lack of problem is one of the things the students like about the course. So, adding a problem to get it closer to the semester project might not be a good idea. However, the way students have worked on their game project has been very close to a PBL approach.

When making teaching more efficient and using the resources in the best way – e.g. teaching the same course in two different locations, this kind of learning environment could beneficially be used in other topics. As the very tight assignments, fast feedback, continuous hands-on work on a single project, and good amount of time to work on assignments should work on a wide range of topics.

7 Conclusion and Perspectives

We have experienced that it is possible to create and implement a practical production-oriented blended synchronous learning environment with the use of video conference system, learning management systems (Moodle), online tools (Google Drive) and teaching assistants

The main findings are that it is important to minimize the usual long lectures, as they do not work as well with VCS and many lectuers do not give the framework for working problem oriented the necessary time for "hands-on" assignments and production of the game. Instead it is advisable to organize the course content around these more practical assignments, and give the teachers the role as facilitators while giving students more responsibilities throughout the course. The design of this course requires a lot from both teachers' capability to handle the technical systems and their capability to act in and use the VCS environment (cameras, screens, sound etc.) and facilitate teaching. A common kick-off in the beginning of each learning activity and "plans for the day" with assignments works as a framework, which keep students informed and motivated throughout the course. The observations, evaluations and survey support our experience as students were motivated and the exam results were also satisfying.

In the future, we plan to experiment with having external consultants from the industry to give feedback to students' concept during the production phase as well, this to increase the relation and work with real world problems. We would also like to experiment with even more collaboration between campuses focusing on game productions with a purpose/message, and not only "engaging" games, in order to hone students' skills in using games as a communication/ persuasive medium.

To prevent some of the problems concerning the use of VCS, we need to look at the physical settings of transmitting the teaching. By putting up one or more transmitting screens in both campus where students can see each other from a front view it might open up new opportunities for both student-student communication and student-teacher communication. This communication opportunity is of great importance in a PBL environment where knowledge and methods learned in courses is meant to be integrated in students' project work.

References

Atweh, B., Shield, P., Godat, M.: The bumpy road of collaborative innovation in online delivery: how to negotiate it? In: proceeding of the Online Learning and Teaching Conference, pp. 10–18. Queensland University of Technology, Brisbane (2005)

Butz, N.T., Stupnisky, R.H., Peterson, E.S., Majerus, M.M.: Motivation in synchronous hybrid graduate business programs: a self-determination approach to contrasting online and on-campus students. MERLOT J. Online Learn. Teach. **10**(2), 211–227 (2014)

Bower, M., Dalgarno, B., Kennedy, G.E., Lee, M.J.W., Kenney, J.: Comput. Educ. **86**, 1–17 (2015)

Askehave, I., Linnemann Prehn, H., Pedersen, J., Thorsø Pedersen, M. (red.): PBL: Problem Baseret Læring. Aalborg universitet. Rektorsekretariatet (n.d.) (2015). http://www.aau.dk/digitalAssets/148/148026_pbl

Cunningham, U.: Teaching the disembodied; othering and activity systems in a blended synchronous learning situation. Int. Rev. Res. Open Distance Learn. **15**(6), 34–51 (2014)

Finn, A., Bycceri, M.: A case study approach to blended learning. In: A Study of Student's Perception in a Blended Learning Environment Based on Different Learning Styles. International Forum of Educational Technology and Society (IFETS) (2004)

Garrison, D.R., Anderson, T., Archer, W.: Critical inquiry in a text-based environment: computer conferencing in higher education. Internet High. Educ. **2**, 87–105 (2000)

Irvine, V., Code, J., Richards, L.: Realigning higher education for the 21st-century learner through multi-access learning. MERLOT J. Online Learn. Teach. **9**(2), 172 (2013)

Ke, F.: An implementation of design-based learning through creating educational computer games: a case study on mathematics learning during design and computing. Comput. Educ. **73**, 26–39 (2013)

Lidstone, J., Shields, P.: Virtual reality or virtual real: blended teaching and learning in a master's level research methods class. In: Inoue, Y. (ed.) Cases on Online and Blended Learning Technologies in Higher Education: Concepts and Practices, pp. 91–111. Hershey, Derry Township (2010)

Park, Y.J., Bonk, C.J.: Is online life a breeze? A case study for promoting synchronous learning in a blended graduate course. MERLOT J. Online Learn. Teach. **3**(3), 307–323 (2007)

Reng, L., Kofoed, L.: New teaching strategies for engineering students: new challenges for the teachers. In: Proceedings of International Conference on Engineering Education and Research. Western Sydney University (2016)

Remenyi, D.: Case Study Research. Academic Conferences and Publishing International Limited, Reading (2013)

Robertson, J., Howells, C.: Computer game design: opportunities for successful learning. Comput. Educ. **50**(2), 559–578 (2008)

Savin-Barden, M.: Using problem-based learning: new constellations for the 21st century. J. Excell. Coll. Teach. **25**, 197–219 (2014)

Schoenau-Fog, H., Reng, L., Kofoed, L.B.: Fabrication of games and learning: a purposive game production. In: European Conference on Games Based Learning, p. 480. Academic Conferences International Limited, October 2015

Schoenau-Fog, H., Kofoed, L.B., Olga Timcenko, O., Reng, L.: Motivated learning through production-oriented game development. In: Games and Education: Designs in and for Learning. Sense Publishers (2018, forthcoming)

Skylar, A.A.: A comparison of asynchronous online text-based lectures and synchronous interactive web conferencing lectures. Issues Teach. Educ. **18**(2), 69–84 (2009). Fall 2009

Stake, R.: The Art of Case Study Research. SAGE Publications (1995)

Stebbins, R.A.: Exploratory Research in the Social Sciences. Sage Publications, Thousand Oaks (2001)

The Study Board for Media Technology: Curriculum for the Bachelor's Programme in Medialogy. Aalborg University (2017)

Szeto, E.: A comparison of online/F2F students' and instructors experiences: examining blended synchronous learning effects. Procedia-Soc. Behav. Sci. **116**, 4250–4254 (2014)

Szeto, E., Cheng, A.Y.: Towards a framework of interactions in blended synchronous learning environment: what effects are there on students' social presence experience? Interact. Learn. Environ. (2014). Advance online publication

Timcenko, O., Kofoed, L.B., Schoenau-Fog, H., Reng, L.: Purposive game production in educational setup: investigating team collaboration in virtual reality. In: Stephanidis, C. (ed.) HCI 2017. CCIS, vol. 714, pp. 184–191. Springer, Cham (2017). https://doi.org/10.1007/978-3-319-58753-0_29

Yin, V.K.: Case Study Research: Design and Methods. Sage Publications, Thousand Oaks (2008)