

Creating an Artificial Context Based on Video-Recorded Competitive Games for Supporting the Learning of Tacit Skills

Harald Kjellin

Computer and Systems Sciences Department
Kristianstad University and Stockholm University
Stockholm, Sweden
harald.kjellin@hkr.se

Houssam Toufaily

Computer and Systems Sciences Department
Stockholm University
Stockholm, Sweden
toufaily@dsv.su.se

Abstract— It is easier for students to learn tacit skills if they get much feedback on their behavior. Extensive resources are required for providing students with enough quantities and qualities of a specific feedback that is directly related to the students' skills or lack of skills. We demonstrate how the demand for extensive feedback resources can be decreased by allowing the students to review film-clips from situations when they and their fellow students received qualified feedback. We will demonstrate a strategy in which we can film students' behaviors by using cost effective filming techniques. The films allowed the students to study their own behavior in detail. Our conclusions from the study is that the presented type of strategy for supporting learning works very well and we advise other researchers to test similar strategies when they need to mass-produce teaching of tacit skills.

Keywords- tacit knowledge; video-clips; filming; feedback structures.

I. BACKGROUND

Learning based on transfer of explicit knowledge is easier to adjust to hybrid learning technology, than is the type of learning that is based on transfer of tacit knowledge. The explicit knowledge can be transferred via symbolic representations of knowledge while the tacit knowledge often requires a number of socializing factors to be successfully transferred. An example of tacit knowledge is to know how to ride a bicycle. The formal knowledge that is written about riding a bicycle might not be enough to successfully know how a person can balance himself/herself while on it.

The challenge of sharing tacit knowledge in a systematic way is that such sharing is a result of constant interactions among individuals and their environments. Tacit knowledge is a form of skill or competence that is acquired by extensive training and repeated activity. Explicit knowledge, on the other hand, is easier to teach because it can be articulated, while the tacit knowledge cannot be explained. Michael Polanyi describes this phenomenon: "We can know more than we can tell" [1] [2].

The use of mainstream media like PowerPoint presentations have shown how important are visual displays in the teaching/learning process. Nevertheless, it is not an

example of an effective way to transfer tacit knowledge, due to its short phrases, and summarized information. This is another example of a relationship between explicit and tacit knowledge. The explicit knowledge may provide us with main directions, but if we do not understand the deeper context of the directions we may be totally lost. Visualization of knowledge is a useful way of creating a context but in the form of Power-Point pictures may not provide us with enough background information to enable us to understand the context of the theories. If we instead have visualizations in the form of content intensive film-clips we may be able to understand a difficult theory related to the film-clip just because the film provided us with such a distinct context for a specific piece of knowledge. [3]

There exists a type of tacit skill that combines several other tacit skills. An example of such a skill is the art of negotiation in situations when the opponents try to win advantages by manipulating a discussion to their favor. Negotiation skills often combine the skills of rhetoric, communication, emotional intelligence, strategic thinking, system thinking, social maturity, etc.

In ordinary classroom situations it is possible to design exercises in repeated training sessions combined with extensive feedback to secure that this type of tacit skill associated with negotiations can be learned. If students do not have the possibility to regularly attend to the classroom, or if there is not enough resources for extensive teacher training, it is very difficult to teach the practical side of tacit skills. In this paper we are investigating to what extent one can use hybrid video film techniques to overcome some of these obstacles. We focus on the use of video clips from filming students' spontaneous behavior. Such video-clips can be available online to enable the students to reflect on their behavior when they are not in the classroom.

The starting point for our interest in video-clips as a means to systemize feedback to students was our discovery that students could have very good grades on the theoretical parts of the course and still have severe difficulties with the practical implementations of the theories.

Moreover, as discussed in [4], students increasingly prefer video podcasts more than traditional media like papers and slides. Figure 1 shows the aforementioned claim.

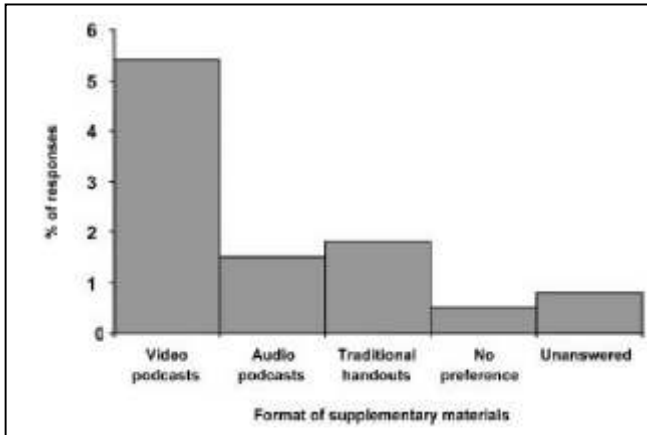


Figure 1: Students responses indicating their preferred format for lecture material [4].

Some of the students could just not make it all the way to demonstrate that they have learned the skills. In situations like this, it is usually concluded that a substantial period of training is needed. However, the problem with training at universities is that for the training to be really successful, each trainee needs to have enough feedback to understand what s/he did right or wrong. An individual trainer/coach can, for instance, give direct feedback about what was good and what needs to be improved in a person's behavior. Such resources are rarely available at universities and this is especially true in on-line/distance or hybrid courses. In such courses there is a delay in the feedback, which makes it difficult to provide the necessary feedback when it is needed. This is especially valid in situations when the student cannot remember or is not aware of which specific behavior was demonstrated during the training.

To remedy the shortcomings of lack of individual feedback as described above the teachers at a course for negotiation at Stockholm University designed competitive games that were all focused on students testing their negotiation skills while giving each other extensive and immediate feedback as a part of how the game was played.

Course evaluations showed that the videos and the games became very popular among students because they could use the videos to be inspired to test similar approaches when they were competing in the games. It became evident for the teachers that the students could learn very difficult tacit skills if they were incrementally given more difficult and also provided with an environment where they could train their skills until they were satisfied with their progress. The artificial context of filmed games with other students supported them in their training since they could compare their own behavior with the behavior of the other students. To combine an eLearning approach of studying other

students' behavior on filmed clips on the web as a preparation for their own game playing was a successful combination that we have classified as hybrid learning. To first study films and then test it directly in action seemed to be an efficient way of transferring tacit knowledge. We were told that such training resembled contact sports, where the trainees repeat a behavior over and over and compare their behavior with the behavior of others until they are satisfied with the correctness and speed of their behavior.

However, some students complained that they felt lost when playing the games. They said they did not know what to say, or what to do, and asked for more specific instructions to be able to handle the complexity of the training situation. Since the practiced skills were tacit and based on the players intuition it seemed difficult to provide the students with enough instructions and feedback on their behavior.

The paper is structured as follows: Section 2 describes the problems with video recording students. Section 3 presents the conclusions from the test of course games in university courses. Section IV shows the results that were reached after performing the video recording experiments. Finally, Sections 5 makes conclusions and suggestions for future research steps.

II. PROBLEM

The problem with video-filming each individual student was that this also seemed to require more resources than what could be available at the university. We realized that there was a need for developing some kind of artificial context based on video-filming that would not require extra resources and would in one way or the other be integrated in the ordinary studies. Moreover, effort of just producing video recording is costly. [6]

III. CONCLUSIONS FROM INFORMAL TESTS OF THE GAMES IN UNIVERSITY COURSES

It was concluded that there was a need for a thorough analysis of why certain tacit strategies among students worked well, while others did not work so well. It was also concluded that the reflective discussions concerning what was right behavior and what was wrong behavior could not be discussed while the games were going on, due to the intensity of the exercises, but should instead be analyzed in detail after a game was over.

There was a need for extensive iterative practices and reflections after each practice on each student's specific behavior if some of the students should be able to learn the very difficult skills taught during the course. It was, however, assumed, that such extensive training resources would not be feasible with the restricted resources provided at the university. So we started looking for other means to secure that each student could get a detailed response to his/her own behavior after they had participated in negotiations.

We had received some hints that video-filming of the students' behavior could solve the problems since it was a well-known fact that video-filming behavior enables the student to reflect on his own behavior. [5]

A. Purpose

The purpose with the study was to investigate to what extent it could be socially and economically motivated to film students when they were engaged in training their skills. One aspect of this purpose was to investigate to what extent the students could learn from each other and from each other's comments while watching the films.

B. Method

Experiments with game playing among students have been tested for the last three years at Stockholm University and at Kristianstad University. Most of the experiments were of the type trial and error, i.e., we tested various types of hybrid technology support during the courses and then we asked the students questions about their experiences via the course evaluation sheets. Step by step our games developed to an extent where we could be quite certain during the start of a course that the majority of students would appreciate the games and would claim that they could detect an improvement in their tacit skills. We were not able to argue for the value of the games from a scientific viewpoint since we could never be sure that students felt motivated solely by the entertaining aspects of the methods. Some critics even voiced the hypothesis that maybe game playing during courses is negative since it may distract students from a more serious approach towards learning and instead motivating them to a more childish approach to their studies.

We discovered one distinct shortcoming with the game playing and that was the difficulty in giving enough of the needed feedback to students that were too defensive to create a response, or too shy to ask for a response, or too detached to act in a way that motivated a response from other students. So, we began by designing controlled experiments with the aim of finding indications of the filming activity as a substantial addition to the level of useful feedback that the students could get during the courses.

The practical setting of the experiments was quite simple. Initially all students were trained over and over at training sessions for at least six weeks until they reached a minimum proficiency in basic skills like: 1) Focusing on the essence of the selling part of the message, 2) Displaying their own motives in a suitable way, 3) Being able to react to provocations without any unnecessary delay in time, 4) Being able to give feedback to other students in a way that was appreciated or respected by the other students.

Once most students reached an acceptable level of communication skills, we started to film the games. One of the strongest constraints on the whole idea of filming was that it was not realistic to spend too many resources for filming. It is well known that high quality films could easily

be an expensive adventure [7]. The combination of the following standardized way of filming was the assumed solution to the economic aspects of the experiments:

- All films were produced in a real-time editing environment with a studio-tool called Tri-Caster. This enabled one single student to edit the games in real-time, i.e., when the games were over there was no need to edit the films.
- All games included extensive presentations of the artificial context of each game. This was designed by allowing the students to win points by requesting explanations to any student that was not clear enough in the presentations.
- Students could win the games by giving much constructive feedback, and they could also win the games by being skilled at a quick and instant response to provocative behavior.
- The moment the games were completed they were put online to allow the students to reflect on their own behavior in the filmed video clips
- Finally students were interviewed and were also answering inquiries about their opinion of the value of watching films of their behavior.

C. A description of the rules in the filmed games and how the rules promoted extensive feedback

The rules of the filmed games were similar to those of the practice games, which helped the students get acquainted to the game rules without much explanation from the teachers, during the filmed games. The rules were as follows:

- The judges, who are the teachers, will start by asking a rhetorical question about a topic that was covered during the course. This step is important to first, make sure that students are not memorizing mechanized answers to straightforward responses. Second, they wanted to see new skills, learned from the practice competitions, being utilized in different situations
- The team that reacts first to the question will be given the chance to answer. During the answering time, the teachers, are looking at how that team is presenting the answer. In addition, the opposing team is trying to seek flaws in the answer, as well as weak points in the answering team's presentation skills, and whether they are using the skills that they learned or not.
- The opposing team gets the turn to reply to the answering team by giving them extensive feedback about presenting the answer, as well as its content. The answering team gets the chance to listen to the feedback, and also how it can be done in a better way, by the opposing team. The importance of this

lies in the fact that the answer, in its context and content, is being done over and over so that students can internalize skills.

- After going back and forth with the answer, between the two teams, the teachers intervene to stop the debate. Then, they give each team feedback about what was good about the presentation and content, and what can be improved. Based on the feedback, they grant each team a score.
- Each team has a personality that they are trying to convey during the game. The opposing team would try to react to the other team's personality by adopting a counter personality. Here, the teams will have to adjust to each other's strategic behaviors to shows the judges how they are using their acquired skills in action.

IV. RESULTS

The students used the films for many purposes:

- To see themselves and the way they acted. This was probably the major contribution of the films to each individual student. We concluded that it supported the student in seeing himself/herself as being an active role- player in the course, which in turn enabled the student to reflect on his/her behavior.
- To play the specific parts of the films where they got much feedback from the other students and from the teacher. The students could play these clips over and over in order to understand why they were evaluated and appreciated in a certain way.

80 students were filmed and many of them were participating in a number of games and were therefore filmed at several occasions. We do not want to tire the reader here with the extensive evaluation material, but it may suffice to say that out of the 80 students 74 of them provided us with much material concerning how they had benefitted from the films. Instead we will just show some examples citations that illustrate some opinions of students:

- "When playing the games there was never any time to reflect about my behavior so I could not manage to understand the essence of the feedback I got until I was able to replay the film".
- "The films showed clearly how all people in the room reacted to my behavior. I often found that the looks on their faces was more useful to me than the feedback I got about my behavior".
- "I have never before so clearly seen talents and defects in my own behavior. Probably because the games forced us all to act spontaneously".
- "We simply did not have time act in a controlled way during the games, and this made us reveal our true nature when communicating".

Another way of trying to interpret the value of the films was to check how often they were watched. We discovered that each single little film-clip was viewed between 5 – 20 times.

V. CONCLUSIONS AND FUTURE WORKS

Our general conclusion is that film-clips of students' behaviors, when they play games, can be reused to support learning. The filmed clips create a distinct artificial context which supports the students learning process. The film-clips can also be used to give an intensive feedback to the students who can see themselves in the films. All in all we believe it is an efficient way of transferring tacit knowledge. Almost all students in the experiments claimed that they learned much from the course. About one third of the participants claimed that it was the most rewarding course they have ever attended. We have no other reflections about this response from students other than concluding that it highlights the possibility to motivate students with a standardized workflow for mass production of film-clips. However, our most important conclusions came from the statements from students, where they claimed that they learned from being able to clearly see all the responses they had received from all other students. As this could be achieved in a filming strategy that did not require extensive technical support, we feel that we stand on firm ground when we recommend other teachers to test similar approaches to support tacit learning of skills.

The results that were achieved have spurred us to continue researching about ways to make those produced video clips reusable on a larger scale. In this way, it makes others, not familiar with the course, grasp the games concept and rules, as well as learn about the knowledge being shared. Moreover, we believe that a future research in context development of fully online courses can help students, studying the course online, manage to perform the games virtually while making sure that tacit knowledge is being shared.

REFERENCES

- [1] M. Polanyi, *Personal knowledge: towards a post-critical philosophy*. Chicago, University of Chicago Press, 1974.
- [2] M. Polanyi, *The tacit dimension*. Chicago, University of Chicago Press, 2009
- [3] L. Prusak and E. Matson, *Knowledge management and organizational learning- A Reader*. New York, Oxford University Press, 2006.
- [4] J. Copley, "Audio and Video podcasts of lectures for campus-based students: production and evaluation of student use" *Innovations in Education and Teaching International*, vol. 44, 2007, pp. 387-399
- [5] D. Zhang, L.Zhou,B. Briggs, and J.F. Nunamaker, "Instructional video in e-learning: assessing the impact of interactive video on learning effectiveness" *Information & Management*, vol. 43, 2006, pp.15-27
- [6] J.P. Shim, J.Shropshire, S. Park, H. Harris, and N. Campell, "Podcasting for e-learning, communication, and delivery" *Industrial Management and Data Systems*, vol 107, 2007, pp. 587-600
- [7] M. Davis, "Editing out video editing" *IEEE Multimedia*, vol. 10, 2003, pp. 54-64