JOURNAL OF EDUCATIONAL AND INSTRUCTIONAL STUDIES
IN THE WORLD
May 2012, Volume: 2 Issue: 2 Article: 10 ISSN: 2146-7463

AUTOMATED FEEDBACK ON BEHAVIOR IN SIMULATED PROBLEM SOLVING IN ORDER TO LEARN MANAGEMENT SKILLS IN A COST EFFICIENT WAY

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Abstract

In order for a person to acquire the type of experiences that changes his behavior, the person needs an extensive feedback on his behavior or his decisions. Although teachers can provide such an extensive feedback, they are expensive and it is not realistic to have teachers act as personal coaches at universities. Student can provide feedback to each other in a more cost efficient way, but then the feedback may be erroneous or irrelevant which may cause students to lose motivation. We present a solution to this problem which is based on having the students participate in competitive games, where the experiences in the games gives the students enough feedback concerning if they did a bad or a good choice. The results from experiments with a variety of games show that the learning in games becomes efficient if they are formalized according to the presented rules of thumb.

Key Words: Games, simulation, management skills.

INTRODUCTION

The knowledge acquired from management sciences often consists of general theories and models that cannot be applied in a single and unambiguous way, as is often the case with natural sciences where knowledge usually is applied in an unambiguous way (Polyani 2009). The type of knowledge that is acquired from management sciences rarely contains specific instructions for how to act in specific situations but the knowledge can, on the other hand, be used for interpreting and explaining behavior of people when transferred as stories (Jones et al 2003). When such knowledge is implemented in complex decisions we can refer to it as maturity or skills that are acquired by experience. The questions elaborated on in this article are how such skills can be taught at universities and what methods can be used to teach it. We are not focusing on how the theories of management science can be applied in a theoretical way, i.e. how they can be used to analyze complex problems but instead we are focusing on how a person can train his or her skills in a way that the manager can make fast decisions and act directly according to the theories of management sciences.

In order for a person to acquire the type of experiences that changes his behavior, the person needs an extensive feedback on his behavior or his decisions (Kjellin 2005), In the management sciences, this is well known and may be the cause of the popularity of allowing managers to be iteratively coached in their behavior and to be able to acquire the needed skill. In the area of pedagogy it has also been well known that the presence of teacher that gives feedback to the behavior of students is crucial for the learning process.

However, teachers, trainers and coaches are expensive and it is not realistic to have teachers act as personal coaches at universities. There are simply not enough resources available for this. This is why most educational institutions promote the use of peer feedback, i.e. having students analyze and comment each other's work. Although this may solve parts of the problem, such a strategy may not work if the students cannot give each other enough of constructive and relevant feedback, which in turn may lead to the students losing their motivation since they do not get a feedback that tells them if they did something right or wrong.

When we discuss skills in management science we are often not talking about any particular set of specific actions but are instead focusing on the extended context of the behavior, i.e. to what extent a decision will results in positive consequences in the future or if a spontaneous act would be appreciated in general in the

organization (Prusak Matson 2006). Such skills involve the extended context of the behavior and not any particular feature of the behavior (Lambe 2006). When we talk about the modification of such behavior it is difficult to conceive of a person modifying his/her behavior if this person does not receive an extensive feedback to the behavior. The question is then how we can produce this extensive feedback without spending an unacceptable amount of resources on producing the feedback. Only top managers can afford to get a continuous personal feedback on their thinking, decision making and behavior from skilled advisors but when it comes to students there is no way we could afford a personal teacher or coach to every student.

We present a solution to this problem which is based on having the students participate in competitive games, where the games in themselves gives the students extensive and continuous feedback concerning if they did a bad or a good choice. The games are carried out in teams of four people playing against four other people while a group of four judges are focusing on four different aspects of the game and are giving the students extensive feedback on their behavior. Once a game is over the losers of the game becomes the new four judges. In this way it is possible to have tournaments in class as a motivator to engage in the games and the only think the teacher needs to do is to supervise that the games are conducted according to the rules.

The students are allowed to comment on the judgments of the judges. Altogether 11 students are able to give response to each judgment, and a consequence of this is that the student judges quickly become good at handling the game.

The games in themselves involve an intense argumentation between the students and the judges can at any time disrupt the argumentation and give points to the behavior of the players. As all students are actively discussing, they all receive extensive feedback about the way they discuss. If they do not discuss or avoid a challenging argument they are also evaluated regarding their avoidance of confrontations. To sum up one can say that the students who participate in the games get an extensive feedback on how they react to challenges and thus they learn to spontaneously practice all type of management skills that can be related to how they communicate their decisions and how they try to influence each other in simulated problem solving.

The type of described training has been practiced in courses in knowledge management and project management (Kjellin Wetterstrand 2010), but the training could as well be used in any kind of university course where students can test their skills in debates with other students.

EVALUATIONS OF THE EFFECTS OF THE GAMES

After each course during four semesters we asked students participating in the games to fill in forms concerning their opinions of the games. All together 420 students were doing this. When we found that a student had more than usual comments in the forms we interviewed this student about the comments in order to be able to interpret the response in relation to all other responses.

In general the analysis of the empirical material was done from a quantitative perspective. We wanted to secure that an enough number of students really were able to benefit from doing the games in order to be sure that it was a worthwhile activity to promote in university studies. The following is a summary of the conclusions.

THE GAMES INCREASED THE STUDENTS' MOTIVATION

The evaluations showed that the students were very motivated to not only participate in the games but also to meet before the games were carried out in order to become masters of debating the knowledge and thus have a greater chance of winning the games. At times it seemed as if the students were as engaged in the game playing as football supporters being engaged in an exciting football game. This was also reflected in the inquiries. 89% of the students claimed that they had enjoyed participating in the games. The 11% that did not enjoy the games usually gave reasons that they preferred to study by themselves or that they considered the games being childish activities or a waste of time.

THE GAMES HELPED THE STUDENTS TO LEARN THE COURSE CURRICULA

The games concerned how the theories learned could be applied in a simulated problem solving. 78% of the students claimed that they had much help from the debates when they made the written exams in the end of the course. This is a strong indication that even if the aim of the games was to support the students in training their skills they could also learn theoretical knowledge by debating it over and over.

STUDENTS CLAIMED THAT THEY SAW LONG TERM BENEFITS FROM THE LEARNING

Some students told stories about how they had tested their newly learned skills in their private or professional life outside the university. This provided us with indications that not only did they students learn the curriculum, but some of them were also enough motivated to continue to develop their skills. When we interviewed these students they claimed that they considered their newly learned skills as something that they would continue to develop.

TO WHAT EXTENT ARE THE RESULTS A SCIENTIFIC CONTRIBUTION?

It is possible to design educational games in many different ways. We concluded that it would not make sense to claim that the games should be designed exactly the way we proposed in order to create good results. On the contrary we believe that it is possible to design games in many different ways and the only way one can be really sure of their success is to test them. We have tested one version of games and in this way we can claim that the probability of success is high if somebody designs educational games in a similar way. However, since the complexity of implementing games is so high we conclude that the results should only be seen as indications of promising directions. These directions we summarize in the next paragraph as our proposals for rules of thumb when designing educational games.

RULES OF THUMB WHEN DESIGNING GAMES

1. The rules of the games should be as simple as possible to secure that it does not take too long time before the students can start to play.
2. Make sure the rules are balanced and promote all types of behavior or students will quickly learn to optimize the game by a single type of behavior. This balance can often not be achieved directly but needs to be continuously modified until the perfect balance is reached.
3. The signals that tells the judges if a student shall succeed or fail (get a credit or not) should be as simple as possible. For instance, a) was there more than two second of hesitation in the middle of talking, b) was there a distinct protest that was distinctly justified, c) was there a repetition of the same argument, or d) was there an evident lack of logic in the chain of reasoning
4. Make sure you have several student judges evaluating the behavior in the games. This makes it easier for each judge to not have to assume responsibility for everything that is going on
5. Make sure the students are able to protest against each other's arguments. This secures that you have as many observing trainers, giving feedback, as there are participants in the games. If one student can protest against another students behavior, this makes it easier for the judges to follow the debates since they judges can then act on a meta-level, i.e. to evaluate the protest rather than the behavior itself.

WJEIS's Note: This article was presented at International Conference on New Trends in Education and Their Implications - ICONTE, 26-28 April, 2012, Antalya-Turkey and was selected for publication for Volume 2 Number 2 of WJEIS 2012 by WJEIS Scientific Committee.

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