

# GodisOmetre – providing feedback on student learning

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**Abstract**—In the Bologna process, the use of explicit learning goals and formative assessment are central elements in improving student learning. Ideally, formative assessment provides feedback to the student about how his present state relates to the learning goals and enables him to reflect on and regulate his learning. However, we found that it was easier said than done – not just to carry out, but in particular to make students realize the importance of learning goals and formative assessment for their learning process.

The GodisOmetre is an attempt to motivate students to become self-regulated learners and to encourage and facilitate reflection. It is a way to make more explicit to students our detailed learning goals and reward also the “good processes” that lead to those goals and not just the “good results” in themselves. Processes and results are defined, as are their reward value and a public score chart is kept – and in the end the earned value is paid out.

In this paper, we describe the GodisOmetre and the didactic ideas and philosophy behind it. We also discuss the lessons learned through two years of use and how it has been improved through trial-and-error and feedback from the students.

## PRELUDE

*The question: “How much do you love me?” can be answered in many different ways. Someone from Mars would probably say: “On a scale from 1 to 10, where 10 is highest – 8.5!” On the other hand, the person from Venus would like to hear: “Higher than the highest mountain, deeper than the deepest river, more than all the money in the world and longer than the time of eternity”. When the question comes up again two days later, the martian will say: “I already told you” and the venusian will answer: “But I need to know it again – do you still love me, do you like my clothes, my hair, my shoes, the way I move, ...”*

*What is it we do as teachers, when students ask us: “How much have we learned?” – do we answer with a single number at the end of a course or do we continuously give them detailed information about their learning? Are teachers from Mars and students from Venus – and will we be able to live happily together on planet Earth?*

## I. INTRODUCTION

**L**IFE isn’t always easy for a teacher. We may have all the best intentions of using the right pedagogical theories in

our teaching. We fully believe that explicit learning goals makes it clear for the students what we want them to learn. We are convinced that formative assessment [11] makes it clear for the students how close they are to attaining the learning goals (besides telling the same story to us). We really care for our students, so we want to implement these principles, but how do we do – and more importantly how do we make sure that the students listen and that we get their attention? Without active student collaboration we will have little chance of success [2] – so how do we get our students to actively participate? This is the story of a teacher who tried to get through all the noise that surrounds students with an attempt to implement explicit learning goals and formative assessment.

The context of the experiments with the GodisOmetre is a project course [7] in which the students work in groups of 8 people. The scope of the project course is to give the participants knowledge about and practical experience on cooperation within a software development team. To make the setting more realistic it is carried out as a role-play where each group has 2 coaches (older students) to follow them and 1 customer (faculty) for whom they develop a product. All groups develop the same product and they go through 6 weekly iterations where each week consists of a two-hour planning session, some individual work and an 8-hour programming session. There is a very close collaboration with the customer who is (in theory) present during all group sessions. Every second week the group deliver a new improved version of the product with new functionality decided by the customer.

In the following sections, we will first explain the motivation that lead to the GodisOmetre, how it was implemented and what experience led to changes from the first to the second year. Then we will discuss how the GodisOmetre relate to pedagogical theories. Next we detail a number of general lessons that we have learned from two years of experiments and finally we draw our conclusions.

## II. GODISOMETRE EXPLAINED

The project course itself has its own learning goals that are at a rather high level. A certain degree of formative assessment is done through the formalised use of “focus practices” [7], which works quite well. After the completion of each iteration, the students are asked to reflect (individually and in group) on their group’s performance on a selected number of the practices in the development method they use (Extreme Programming [3]).

However, according to the spirit of the role-play, the customer pays for the product and therefore his wishes have to be fulfilled. Unfortunately there are so many things that occupy the students' attention that the customer felt somewhat ignored in his requests and feedback. The students' attitude was like: "Yeah, OK – whatever" – and then they were off to something else. So the customer felt that he needed something that could cut through all the "noise" – a way to be able to "shout" loud enough to be listened to.

The basic idea of the GodisOmetre is that the customer has a detailed list of tasks that he wants the group to perform and each task has a price tag on it. This is very close to the spirit of the development method that they use [3]. For every functionality requested by the customer, the development group puts an amount of money that is paid when the customer has verified its implementation. Contrary to real-life Extreme Programming projects, there is no real money involved on the student projects.

The customer decided to change that and bring more reality into the project. For each task he wanted the group to do, he would put a price – in grammes of candy – that would be credited to the group's account if carried out. Some of the tasks were functionality that the customer wanted implemented, but many tasks were related to behaviour that the customer wanted to reward or punish. The author was the customer for three groups and a tally was kept and updated twice a week because the customer wanted to have continuous attention from the groups to his feedback and not just every second week when they would release the product. The tally was public so all groups could see the tasks and evaluation (in terms of grammes of candy) of all groups. The purpose of this was to create more attention and shift the focus the competition that there already was between groups from implementing most functionality to getting most candy. In this way the focus would be taken away from the product itself and put on the processes (learning) deployed – rewarding not only a good product but also good processes. The total amount of candy would be paid out to each group as a formal part of the final project presentation and evaluation – and consumed during reflecting on the course outcome.

When the author reflected on the outcome of using the idea of a GodisOmetre he realised that even though it served its purpose in general, there were some things that could be improved for the next year. The customer had indeed gotten the attention of the groups and also managed to create competition between the groups to be on top of the GodisOmetre. The bad thing is that getting attention means that students really do what you ask – and that was not always good for learning (as wasn't the previous focus on the product), so more care was needed in formulating the learning goals and the assessment. Furthermore, it became evident that all groups were not alike, in the sense that they needed to or were ready to learn the same things at the same time.

The second generation of the GodisOmetre saw a number of minor adjustments while retaining the general structure from the first year. The most important change was more care in choosing and formulating the tasks – and an explicit emphasis

towards the students that the tasks were also learning goals and the customer also a teacher. We adopted some of the principles for good feedback practices from Nicol et al [9], which made it easier to obtain the wanted focus on the process in the list of tasks. Furthermore there was a move away from a predefined, fixed standard list of tasks towards a more individualized list tailored for each group – though many tasks still were in common. Finally, we put more care in talking to the students about the motivation for feedback instead of just communicating it as a number of grammes of candy. This happened as the result of one student in a group finding an evaluation so unfair that he just couldn't keep quiet – which resulted in a very constructive discussion and the whole groups being active in questioning (and discussing) some evaluations from that point on. In total, all this meant that the initial idea of playing down the importance of the product and stressing the importance of the process (i. e. learning) was further strengthened.

### III. RELATED THEORY

The ultimate goal of the GodisOmetre is to help the students become self-regulated, long-life learners [10, 12], who can formulate their own learning goals and assess them.

In order to obtain this, we need to have extreme focus on the values of good and explicit communication with and feedback to and from our students as suggested by eXtreme Teaching [1]. Being of a highly iterative nature, the eXtreme Teaching framework allowed us to use the feedback we got to continuously improve the GodisOmetre. In fact, what was presented as generation one and two of the GodisOmetre in section II above was the final result of each generation and not that of the outset.

We also need to provide several occasions for actually experiencing formative assessment for our students to be able to practice it. The students should be taken through all the steps of Kolb's learning cycle [8] – and they should be taken through it several times, gradually gaining more and more confidence with assessment and self-assessment. Furthermore, we should assess as many different levels, using Bloom's taxonomy [4] (or other taxonomies) for explicitly expressing what level of learning we are aiming at for each learning goal. Often it can be difficult to use all of Bloom's levels when formulating the overall learning goals stated in the study plan. The GodisOmetre provides opportunities for more detailed learning goals and a more detailed, varied and individualized use of Bloom's taxonomy. Ideally all levels in Bloom's taxonomy should be used when formulating learning goals.

It is not the sole responsibility of the teachers or the department to create an environment that stimulates and promote learning [6]. Although teachers do (or should!) have more knowledge about pedagogical methods, and as such should take pedagogical leadership, it is important that students are made aware that learning is a "joint venture" and that they too have responsibility for their own learning. We as teachers can create the structures, but without the active participation of the students even the best thought out pedagogy will not succeed as it was intended. In our particular

context, it was also important that we kept the GodisOmetre as something between the students and the customer/teacher and kept out the coaches (senior students), such as not to compromise their role in the role-play. Different context may have different needs for who is involved in the assessment, when and to what degree.

When formulating learning goals it is important that they be expressed so they are testable [9, 11]. All assessment you do sends a message to the students. Questions you could ask yourself about your assessment “tasks” are:

- does the question test an essential part of the material?
- does the student use the content/material to arrive at the answer?
- is the student examining his own thinking?

It is also important that you discuss and give feedback on the (result of the) assessment [9]. In our context, there were natural moments for discussion during the planning session and the programming session where we physically met the group. We were able to clarify what good performance is, deliver more informative feedback, encourage positive motivation and self-esteem in the group (important when the assessment result is negative), and provide opportunities for suggesting how they could close the gap between our expectations and their performance. It is also important to use the results of the assessments to improve the assessment. We should test common student misconceptions too as they help the students get a deeper understanding of the topics. One way to do that is to add new assessments as we discover the misconceptions - just like they add new tests in Extreme Programming [3] as they discover new bugs.

#### IV. LESSONS LEARNED

It is our experience that students are surrounded by a lot of “noise”. Not just from other courses or other aspects of our own course, but also in their everyday life. Therefore there is a strong competition for the students’ attention and we need stronger mechanisms for keeping their focus where we want them. The strongest mechanism we have is the final exam, but that does not really provide students with an opportunity to “recover” from their mistakes. Continuous formative assessment with the GodisOmetre does permit them to improve during the course, while still being sufficiently strong to get the attention.

The GodisOmetre is also excellent for courses that either have “fuzzy” or individual learning goals and/or where it is difficult up-front to detail what will be learned and when because different groups or students have very different - and varying - learning speeds and encounter different problems and difficulties. We are able to express more than just a few fixed learning goals, we can detail and individualize learning goals, and we tailor the learning goals and assessment questions during the course based on the feedback from the results.

Finally, the use of the GodisOmetre provides many natural occasions for dialogue with the students about the results of the assessment - and about learning.

This brings us to what is still to improve in the GodisOmetre. A drawback is that it is quite time consuming and difficult to carry out the assessments - especially the more process oriented assessments. In the next generation GodisOmetre, we therefore plan to use the ideas of Boud [5] to arrive at sustainable assessing and leave more and more assessment to the students, while still keeping it is a formal framework so they do not ignore it. Furthermore, we intend to give the students this paper to read so they will become informed and more aware of what is actually going on.

#### V. CONCLUSION

The GodisOmetre is a framework for stating learning goals and assessing them so everyone can see the results. Its public character and competitive aspects makes it a strong message you send to the students and that it draws a lot of attention. So it has to be used with care and balance so it will not take away focus and attention from other important learning goals in your course - and other courses.

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#### DISCLAIMER

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