

# Awarding bonus points as a motivator for increased engagement in course activities in a theoretical system development course

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**Abstract**—This research to practice full paper focuses on gamification in a theoretical university course. Gamification has been applied in many different educational contexts as a means to motivate students to engage with course material. One commonly used gamification element is bonus points. This study aimed to investigate the use of bonus points as a motivator for increased engagement in course activities in a theoretical system development course in higher education. A mixed method approach, based on statistical analysis of course achievement, survey data and student group interviews has been applied to address this aim. According to the results, we found that awarding bonus points in the course seminars had positive effects on students' learning motivation and engagement, as well as students' achievements on the final course examination. This study contributes to the current literature of gamification in education by studying the implementation of bonus points in a theoretical course in higher education – two areas where there is currently a lack of studies. Furthermore, practical insights in how to implement a bonus points system in higher education have been highlighted.

**Index Terms**—bonus points, gamification, higher education, motivation, theory course

## I. INTRODUCTION

The lack of engagement and motivation in learning from students is one of the concerns among teachers. Keeping students motivated and engaged in various course activities during the entire course period is a challenging task for teachers. For instance, students may feel bored in acquiring theoretical and conceptual knowledge. When students are not able to truly engage in the course activities, they may not be able to success in passing the course's final examination. It is very important for teachers to refine existing teaching practices to keep students motivated for learning. Gamification can be used as an effective assistive tool to motivate students in pursuing course learning objectives in various course activities.

Gamification is an umbrella term for the process of using game mechanics outside of traditional games with the goal of improving user engagement and motivation [1]. Gamification aims to improve user engagement [2], and to motivate users [3]. Gamification has been applied in several business areas. For instance, gamification has been identified as one of the

effective methods for enhancing employees' information security awareness (ISA) in both private and public organizations [4]. Gamification has been proven to be a suitable solution for enhancing employees' ISA since it can be used to create personalised ISA training content to suit employees' needs [5]. In addition, gamification and resource polling methods have been successfully used to enhance employees' engagement and improve operational efficacy in a company in ecommerce industry [6]. Gamification also has potential to be integrated with educational activities to further motivate students and improve students' learning outcomes. For instance, bonus point systems is one of the popular gamification elements in the educational domain. Awarding bonus points in course seminars may for example incentivize students to study harder and engage more in the course activities.

Gamification is closely connected to the concepts of extrinsic and intrinsic motivation. Intrinsic motivation relies upon a student's interest to undertake a task as well as the accompanying pleasure and satisfaction derived from the task, while extrinsic motivation relates to engagement with a task for external reasons [7]. Awarding bonus points can be seen as an example of extrinsic motivation.

Although bonus point systems aimed at incentivizing students' study have been implemented in different subjects (e.g., mathematics study at upper secondary level) [8], there are not many studies focusing on the effects of awarding bonus points on students' learning motivation and engagement, and course performance in higher education. Therefore, this study aims to investigate how awarding bonus points at a group level would influence students' learning motivation and engagement during course seminars, as well as course achievements, in a theoretical course (i.e., system development theory course) in higher education.

The remainder of the paper is organized as follows: the theoretical background of this study is provided in Section 2. The studied case is presented in Section 3. The method is described in Section 4. Section 5 presents the results of this study. This is followed by a discussion of the findings in Section 6. Lastly, a short conclusion is provided in section 7.

## II. THEORETICAL BACKGROUND

### A. Gamification

Theory of gamification in education formed the theoretical bases for the work. Seaborn and Fels [9] define gamification as “the use of game elements and mechanics in non-game contexts”. This appears to be the definition that is mostly used in the literature related to gamification of education, but other do exist like the more detailed one by Kapp [10]; “Gamification is using game-based mechanics, aesthetics and game thinking to engage people, motivate action, promote learning, and solve problems”. Gamification has been used with success in several subjects and often include elements of bonus point systems, leader boards or variations of challenges [11] to motivate students to learn. Even though there seems to be a consensus regarding the definition of gamification, Roy and Zaman [12] argue that it is less clear what prerequisites need to be fulfilled, for example regarding amount of game characteristics implemented, for a design to be accepted as a gamified one.

### B. Using bonus points

In games, bonus points can be awarded for performing a particular task or fulfilling a particular requirement. To apply bonus points in gamified education, the use needs to be connected with relevant teaching activities. For instance, bonus points can be awarded to students after they have successfully completed a special given task.

Previous studies suggested that awarding bonus points would have a positive impact on students’ learning motivation [13]. For instance, the results from the study by Miglietti [14] indicated that the use of bonus points did have a positive influence on students’ learning motivation in an accounting course. In addition, the results from a study by Rassuli [15] revealed that the use of bonus points has the potential to supplement relevant classroom activities to generate students’ learning interest.

Furthermore, previous studies also found that gamification in terms of awarding bonus points has the potential to improve students’ learning outcomes. For instance, a game-based learning approach in terms of awarding bonus points has been used in a physical chemistry course [16]. The results from Daubenfeld and Zenker [16] indicated that the failure rate in the final examination was reduced because of bonus points that students could receive with the successful completion of the course games. Moreover, a gamified instructional process in terms of awarding bonus points has been implemented in an ICT course [17]. The results from the study revealed that the use of bonus points indirectly affected students’ academic achievement due to the positive effect of awarding bonus points on students’ engagement in the classroom.

### C. Extrinsic and intrinsic motivation

The concepts of extrinsic and intrinsic motivation are tightly connected to gamification and play important roles in this paper. Extrinsic motivation relates to external factors, like awarded bonus points, and intrinsic motivation relates to an

inner drive to learn [18]. These two concepts are connected through self determination theory, which is a theory of high importance to gamification research [12]. Ryan and Deci [19] describe the regulatory styles and modes associated with extrinsic and intrinsic motivation, respectively. Intrinsic motivation, which is often aimed for in gamification initiatives, is only associated with intrinsic regulation through a process driven by for example enjoyment and interest. Extrinsic motivation, on the other hand, is associated with a range of styles from external regulation, driven by e.g. the need to satisfy external demands, to integrated regulation, driven by regulations that one has assimilated and accepted as a part of one’s values and needs. Ryan and Deci [19] state that “actions characterized by integrated motivation share many qualities with intrinsic motivation, although they are still considered extrinsic because they are done to attain separable outcomes rather than for their inherent enjoyment.”

## III. THE CASE

In this section, the course and its setup are introduced.

### A. System development theory

The System development theory course is a mandatory course for third year students in the system development bachelor program at a university in Sweden. Implementing effective ways to encourage students to learn theoretical knowledge with system development is an important issue in the system development bachelor program since students are supposed to gain a good understanding of system development methods before writing the bachelor thesis.

This course handles theories and frameworks relevant for system development, as well as scientific reasoning and argumentation. The course, which is based on a mix of lectures and presentation seminars, addresses the following four modules:

- The historical development of system development methods
- The general structure of system development methods
- Tailoring system development methods to specific projects
- Analysis of and discussions around scientific literature

### B. Course structure

This course includes nine lectures, three course seminars, and an individual final written examination. The lectures and seminars are designed to address the modules mentioned above.

The course seminars are carried out in the form of group presentations. Each group should have 4 to 6 student members. Active participation during these seminars is mandatory for the students. The schemes of three course seminars are as follows.

- Finding appropriate methods based on a given system development perspective for a given case
- Tailoring a method to account for specific project circumstances in a given case
- Critical analysis of argumentation in earlier bachelor theses

TABLE I  
ASSESSMENT CRITERIA FOR SEMINAR 1 AND SEMINAR 2

Assessment criteria	Bonus point quality
Relevance	The presentation is highly relevant to the given tasks in the seminar and shows that the students have a thorough knowledge about the concepts of importance to the particular seminar.
Grounded argumentation	The presentation has strong arguments throughout, which are based on a correct application of the Toulmin model and relevant references to systems development theory (especially the concepts of importance to the particular seminar).
Responding to the questions	The group members respond to the question in a way that is appropriate for the audience and shows knowledge about relevant concepts. The posed questions should be non-trivial and discussion-focused.
Preparation of oral presentation	The students in the group are very well prepared for the presentation and delivers the presentation in a professional manner (hesitations due to language issues in the English speaking groups will not be held against you here).
Structure of oral presentation	The presentation is well structured with introduction, middle and end and clearly illustrated to guide the audience through the presentation.

TABLE II  
ASSESSMENT CRITERIA FOR SEMINAR 3

Assessment criteria	Bonus point quality
Relevance	The presentation is highly relevant to the given tasks in the seminar and shows that the students have a thorough knowledge about the key aspects of high quality bachelor theses.
Grounded argumentation	The presentation has strong arguments throughout, and uses examples that clearly proves the key points that the group wants to make.
Preparation of oral presentation	The students in the group are very well prepared for the presentation and delivers the presentation in a professional manner (hesitations due to language issues in the English speaking groups will not be held against you here).
Structure of oral presentation	The presentation is well structured with introduction, middle and end and clearly illustrated to guide the audience through the presentation.

The student groups are required to prepare presentation slides to address the given tasks of the respective seminars and upload the prepared slides no later than two hours before the respective seminars. The structure of the course seminars is as follow:

- Each group presents their prepared work, with no break in between
- 5-10 minutes break
- Follow-up discussion led by the teacher

The final individual written examination consists of four open ended questions. Each question can give 0-5 points. Thus, the maximum score a student can get in this exam is 20 points. To pass the exam, a student needs to get at least 10 points. To pass the exam with distinction, a student needs to get at least 16 points.

### C. Implementing a bonus point system

Despite the course seminar being one of the important components in higher education, it seems that some students tend to focus more on the final individual written exam than mandatory course seminars. Students are often more interested in getting good grades in the final individual written exam than having active participations in the course seminars. For instance, some students just want to complete the required tasks in due time. However, this might be not able for students to gain a deep understanding of relevant course content. In this study, we have applied gamification in terms of awarding bonus points to re-design the three course seminars. The bonus points have been introduced into the course seminars as an

incentive to motivate students to study the relevant course modules.

The implemented bonus points schema is presented as follows. Students can get bonus points at a group level on the final individual written exam (maximum 1 bonus point per seminar) if they have done an excellent job with three course presentation seminars. Thus, each student has the potential to earn 3 bonus points on the final exam from the work on three course seminars.

### D. Assessment and grading

There are five assessment criteria (see Table I) for getting one possible bonus point for course seminar 1 and seminar 2. If the group manages to fulfill the expectations listed for all 5 criteria during a particular seminar, the group members will get 1 bonus point on the final exam. Half a bonus point will be awarded to the group members on the final exam if they fulfill the expectations for 3-4 criteria. No bonus point will be awarded to the group members if they fulfill the expectations for less than 3 criteria.

There are four assessment criteria (see Table II) for getting one possible bonus point for course seminar 3. If the group manages to fulfill the expectations listed for all 4 criteria during the seminar, the group members will get 1 bonus point on the final exam. Half a bonus point will be awarded to the group members on the final exam if they fulfill the expectations for 3 criteria. No bonus point will be awarded to the group members if they fulfill the expectations for less than 3 criteria.

As a result from the assessment criteria above, a student can get a maximum of 3 bonus points on the final exam from the

work on three course seminars. If a student gets 3 bonus points from the course seminars, the student needs to get 7 points and 13 points to get a pass grade and a pass with distinction grade on the final exam, respectively. It is also important to note that only whole bonus points can be transferred to the final exam. For instance, the student will get 1 bonus point on the exam if the student receives 1.5 bonus points from the seminars.

#### IV. METHOD

A mixed methods approach has been used to investigate the effects that the implemented bonus point system had on course achievement and student motivation.

Descriptive statistics was used to investigate the effect that 1, 2 or 3 bonus points, respectively, had on course achievement. In preparation for the quantitative analysis, the students were divided into groups depending on how many bonus points they got from the seminars (1, 2 or 3). This partition enabled comparisons between course results from these different groups of students. As a first comparison, the mean number of exam points, without added bonus, was calculated for these three groups. This was done to investigate whether the bonus points were actually needed to reach the highest grade or the passing grade, respectively. If students after a successful attempt to collect all possible bonus points perform very well on the exam (PwD), this for example indicates that the bonus point system contributes with more than just some extra points. In the second comparison the percentage of students in the three groups who got the different grades (F, P, PwD) with and without bonus points, respectively, was calculated. This was done to investigate the effect of adding bonus points to the final exam on the achieved grade. Last, two chi-square tests (significance level set to 0.05) were performed to investigate if there were any significant associations between the awarded bonus points and the final grade achieved with and without bonus points, respectively. The first test will show if a higher amount of bonus points is associated with a higher grade even without bonus points being added and is thus highly related to the first comparison described above. The second chi-square test investigates the association between amount of bonus points and the final course grade and is thus related to the second comparison.

To investigate the effect of the bonus points system on student motivation and to gather student opinions of the system, group interviews were carried out with 10 students (7 males and 3 females), constituting 9.2% of the student population. Three group interviews in total were carried out. The following questions were asked in the interviews:

- What do you think of the idea of having the bonus point in the course assignment?
- Does the bonus point schema motivate you to carry out the course assignment in a better manner?
- Do you have suggestions to improve bonus point practices in the course assignments in the next year?

The result of the following questions on the course evaluation survey was also used for the same purpose (5-point Likert scale from “Agree completely” to “Do not agree at all”):

TABLE III  
RESULTS ON THE FINAL EXAM, WITHOUT BONUS POINTS ADDED, FOR STUDENTS WHO GOT 1, 2 AND 3 BONUS POINTS, RESPECTIVELY.

Bonus points	Final exam results without bonus points added		
	students, n(%)	Mean points	Mean grade
3	36/100 (36%)	15,9	Pass with Distinction
2	51/100 (51%)	14,3	Pass
1	13/100 (13%)	11,2	Pass

- The bonus point system caused me to make extra preparations for the seminars
- The bonus point system inspired me to work harder to understand the course content

In order to qualitatively compare the last course round, without the bonus points system, and the current course round, the involved teachers (the authors of this paper) also reflect on teaching experiences from these course rounds, using real scenarios as examples. This part was seen as a complement, since it is not as scientifically sound as the other employed methods.

#### V. RESULTS

##### A. Effects on course achievement

To investigate the relation between the awarded bonus points and points on the exam, the mean points on the exam (without bonus) for the students who got 1, 2 or 3 bonus points respectively, was calculated. The results are shown in Table III.

As seen in the table, the mean grade on the exam was above the passing grade in all cases, so most students did not really need the bonus points to pass the course. Additionally, the mean grade on the exam (without added bonus) for students who collected all 3 bonus points was PwD, showing that students who collected all possible bonus points achieved the highest grade before the bonus points were added. The results in Table III also show that the majority of the students collected at least 2 bonus points.

Table IV shows the proportion of students who achieved the different grades with and without bonus points added, respectively. The results in the table include all results reported after the first re-exam in December 2021. As can be seen from the table, the majority of the students who collected all possible bonus points (3) had the highest grade (VG) on the exam before the bonus points had been added. The proportion of students who received this grade was considerably lower in the student groups that received 1 and 2 bonus points, respectively. Conversely, the proportion of students who failed the exam was much higher in the group of students who collected 1 bonus points compared to those who collected 2 or 3 bonus points.

A chi-square test was performed to find out if there was a statistically significant association between the number of bonus points collected and the grade on the exam (without bonus points added). The relation between these variables was found to be significant,  $\chi^2(4, N = 100) = 17.0, p = 0.002$ .

TABLE IV  
PROPORTION OF STUDENTS WHO RECEIVED F, P AND PWD WITH AND WITHOUT BONUS POINTS, RESPECTIVELY

Bonus points	Grade, without bonus points added			Grade, with bonus points added		
	<i>n</i> (%) PwD, without bonus	<i>n</i> (%) P, without bonus	<i>n</i> (%) F, without bonus	<i>n</i> (%) PwD, with bonus	<i>n</i> (%) P, with bonus	<i>n</i> (%) F, with bonus
3	23/36 (63,9)	11/36 (30,6)	2/36 (5,56)	30/36 (83,3)	6/36 (16,7)	0
2	18/51 (35,3)	30/51 (58,8)	3/51 (5,89)	35/51 (68,6)	16/51 (31,4)	0
1	1/13 (7,69)	9/13 (69,2)	3/13 (23,1)	1/13 (7,69)	10/13 (76,9)	2/13 (15,4)

Hence, the more bonus points a student collects, the more likely it is that they will achieve the highest grade on the exam no matter if the bonus points are actually counted in or not.

When considering the final grades, after the bonus points had been added, it is clear from table IV that the bonus points had a larger effect on the groups of students who received 2 or 3 bonus points than the group who received just 1 bonus point. The amount of students who achieved the highest grade nearly doubled in the group who received 2 bonus points.

A chi-square test was performed to find out if there were any statistically significant association between the number of bonus points awarded and the course grade (exam result with bonus points added). Even in this case the relation between the variables was found to be significant,  $\chi^2(4, N = 100) = 32.6, p < 0.001$ . Hence, students who collect many bonus points are more likely to achieve a good grade on the course.

#### B. Students' experiences

The course evaluation indicated a strong support for the bonus point system, although only 14 students (12.5%) answered this post-course survey. The median result for the statement "The bonus point system caused me to make extra preparations for the seminars", was 1 (strongly agree). In total, 71.4% of the students agreed or strongly agreed to this statement, indicating that the possibility to collect bonus points had a positive effect on the content covered during the seminars.

The median result for the statement "The bonus point system inspired me to work harder to understand the course content" was also 1 (strongly agree). In total, 64.2% of the respondents agreed or strongly agreed to this statement, indicating that the implemented bonus point system had a positive effect when it comes to the drive to learn the core content of the course.

The interviews with students also yielded some positive results with regards to the implemented bonus point award system. The interviewed students agreed on that the general idea of using bonus points as a motivator was good. The students did not only acknowledge the benefits related to the motivation to dig deep into the course material, but some students also pointed out that the bonus point system probably increased the quality of presentations and discussions during the seminars.

One of the interviewed student groups (3 students, online) stood out when it comes to motivational effects of the bonus point system. The students believed that this course setup for

seminars (awarding bonus points for excellent performance) was the best one among the courses they had taken thus far. It should be noted here that the course in system development theory is the second-to-last course on the system science bachelor program. They motivated this by referring to the added incentive to dig deep and really understand the rather complex course content. The same students also believed that this was one of the few courses in which preparations for, and activity during, seminars really counted for something. The other groups seemed to agree especially when it came to the aspect of promoting activity during preparations and presentations.

Some interesting suggestions for improvements also came up during the group interviews. One of the groups commented that even though the bonus point system inspired them to invest more time in learning the content, it could affect the final exam result in a negative way. Since the maximum number of points on the exam was 20 and the maximum amount of bonus points was 3, they saw the possibility of students not taking the exam that seriously. For example, students who collected all bonus points only needed an additional 7 points to actually pass the course. The students suggested that the maximum number of bonus points should be smaller to make sure that the final exam was really taken seriously. Another group suggested that the groups should only be awarded 0 or 1 bonus point and hence the possibility of collecting 0.5 bonus points should be taken away. These students thought that it was a little bit too easy to get at least 1 bonus point from all the seminars together. The same group also acknowledged the problem of all students in a group being awarded bonus points no matter how much they had actually worked on the preparations prior to the seminar.

## VI. DISCUSSION

The results clearly show that the implemented bonus point award system had a positive effect on course achievement. One of the most important aspects is that the majority of the students who collected all possible bonus points – something that is quite an achievement given the demands on the content of the presentations – achieved the highest grade even before the bonus points were added. Since the exam to a large extent is based on theories and other content that is elaborated on the seminars, we argue that students who really worked to collect all points had to dig deeper into the course content to really understand and apply it correctly, and thereby did not really need the actual points. This clearly indicates that the introduction of bonus points motivated these students to

really learn and analyze the course content. Even students who collected 2 bonus points, who were in majority, achieved a mean point on the exam that enabled them to achieve the highest grade after the bonus points were added. At the other end of the spectrum we can see that students who only managed to collect 1 bonus point had a mean score on the exam that was very close to the passing limit.

As was the case in the study by Çakıroğlu et al. [17], the implemented bonus point system also clearly had an effect on students' engagement in the classroom. During earlier course rounds it was difficult to get students to engage in the course material and especially in activities performed during seminars. The teachers' experience from earlier course rounds is a lack of engagement from students and presentations that include only the parts necessary to pass the seminar requirements. During the last course round, where the bonus point system was implemented, the student groups were a lot more engaged not only in their own presentations but also when critically discussing the content of other groups' presentations. This increased activity gave the students more opportunities to engage with the course material, which in turn resulted in a generally high course achievement in a course where 35% of the students usually get the highest grade and around 15% usually fails on their first attempt. It is interesting to relate this discussion to the regulatory styles and processes connected to the self-determination theory [19]. It is of course clear that the students engage with the course content and assignments due to external sources and are thereby extrinsically motivated to perform well due to the possibility of being awarded bonus points [7]. The high engagement indicates however, that the behavior is not externally regulated (e.g. driven by compliance), but rather subject to identified regulation (driven by e.g. personal importance or conscious valuing) or maybe even integrated regulation. The students seemed genuinely interested in the course content and engaged in critical discussions and this clearly indicated that they were not only motivated by the drive to collect those points.

The results were mostly positive with regards to student perceptions. In the course survey, the vast majority (71.4%) believed that the bonus points had a positive effect on the seminar content and the same goes for the effect on the drive to learn the core course content (64.2%). It is important to note here, though, that the response rate on the survey was very low and hence these results should only be seen as indications.

When the quantitative results on student perceptions are combined with the qualitative findings from the group interviews, the results become more clear. All interviewed students were in complete agreement that it was a good idea to use bonus points as a motivator for being encouraged to dig deeper into and really analyze the course content. This can be directly linked to the results on the course achievement that was generally very high. The results are clearly better than the results from earlier course rounds. It was also interesting to note that some students pointed to the fact that the bonus point system also most probably had a positive effect on the interactions between students at the seminars. These results

also suggest that the bonus point system, through an increased engagement in critical discourse during seminars, increased the quality of the learning and it should not come as a surprise that this in turn was reflected in better overall course achievement. As teachers, we could clearly see this change in the amount of interaction and critical reflection – the students showed a deeper understanding of the course content and could engage in critical reflection to a much higher degree than during earlier course rounds. Again, this indicates that their actions during seminars were not only driven by the possibility to earn bonus points, hence not only externally regulated [19]. Comments from students rather indicate that the bonus point system was more of a catalyst that sparked a real interest in and appreciation of the importance of the course content. Whether or not their actions were intrinsically regulated or rather based on identified regulation is difficult to judge.

Furthermore, we also noticed some problems with the use of gamification in terms of bonus points in the course. The findings from the interviews indicated that it would be too easy for some students to pass the final exam with three awarded bonus points from three seminars. Students with different goal orientations may have different perceptions on the awarded bonus points from the course seminars. For instance, some students may just want to get a pass grade for the course. As a result, the awarded bonus points from the seminars would potentially minimize some students' effort invested in preparing for the final exam. This finding is in line with the finding from Hakulinen and Auvinen [20], which stated that the applied gamification in terms of badges in a computer science course did not motivate the students who prefer to minimize the effort invested in the course.

#### *A. Theoretical contribution*

This study made some contributions to the existing research on the use of gamification elements in teaching. Firstly, there is a lack of studies on applying gamification elements in theoretical courses. Previous studies (e.g., [17] [16]) on the gamification element (i.e., bonus points) have mainly applied in STEM courses (e.g., mathematics, chemistry, ICT). In this study, we have applied gamification in terms of awarding bonus points in a theoretical course. The theoretical knowledge learning process is different from gaining knowledge from STEM courses. For instance, theoretical knowledge is often about reasoning, theory of knowledge. Theoretical knowledge is often gained through reading many relevant articles while practical knowledge is often gained by practicing something (e.g., doing experiments). Therefore, it would be more challenging for teachers to keep students motivated and engaged in theoretical courses than practical courses. The bonus system approach applied in our case gives a concrete example of how one can utilize gamification to motivate students in a purely theoretically oriented course. Furthermore, it is also interesting to see how students would behave in other types of courses (e.g., a more practical-oriented course) regarding the use of gamification in terms of awarding bonus points. Students may have different preferences for solving theoretical oriented tasks

or practical oriented tasks. For instance, some students might be better motivated by bonus points that are rewarded for solving challenging practical tasks (e.g., completing a coding task). This would also provide an opportunity to compare students' behavior in terms of motivation and engagement when it comes to effects of applying the gamification element in terms of bonus points between theoretical-oriented courses and practical-oriented courses.

Secondly, to the best of our knowledge this study is one of the first of its kind in investigating the use of bonus points in the higher education setting. In relation to study settings, previous studies (e.g. [8]) on using bonus points tend to focus on various courses in upper-secondary education. In this study, we examined the use of bonus points in a course in higher education. It contributes to current literature on the use of gamification elements in higher education.

Thirdly, this study demonstrates the importance of awarding bonus points that can make a difference in motivating students' learning and improving students' course achievements. This is in line with the findings from previous studies (e.g. [17]). This contributes to the current literature on the use of gamification elements in teaching. The use of bonus points is an efficient motivator for engaging students in the course activities (e.g., course seminars). It is of help to motivate and engage students in putting extra efforts to complete given tasks in a good manner. In other words, it means that awarding bonus points, with its positive effects on students' learning motivation and engagement, could be an important factor to improve students' final course achievements.

### *B. Practical contribution*

The findings from this study provide some implications for practice. Firstly, the bonus point awarding approach can be used to motivate students' learning and improve students' course achievements in higher education. The study shows that it can be beneficial to implement this kind of simple gamification approach in a purely theoretical course. We recommend teachers in similar courses at other universities to try this or similar approaches, especially if high student engagement is difficult to achieve.

Secondly, the weight of the maximal bonus points in the final exam should be reasonable. This is to make sure that the bonus point system in itself will not be demotivating in a way that makes students care less about reading for the final exam. In this particular study, the bonus point implementation did not seem to have a large negative effect since a large proportion of students got the highest grade before adding 3 bonus points, but the student comments discussed earlier should be taken seriously.

Thirdly, having a mechanism to award bonus points at an individual level seems to be preferable among the students. Some students revealed during interviews that they wanted to receive individual based bonus points for the conducted group presentation in the course seminars. In this way, students will not be able to get bonus points without doing hard work. With

the current implementation, this could happen if the student happens to be part of a generally high performing group.

Fourthly, there is a need to have an efficient digitalized mechanism for bonus points reporting from the teachers' perspectives. Currently, bonus points reporting is not a regular feature in learning management systems. The system developers of learning management systems can implement a new system feature to facilitate the process of bonus point reporting. During this course round, the teachers experienced an added workload due to having to use a separate excel-sheet to keep track of all bonus points and then having to report the results to all groups after the seminars.

### *C. Limitations*

There are a few limitations to the work presented here. First, the study only includes one fairly limited gamification component – awarding of bonus points. Gamification in education can include many more aspects like diplomas for outstanding performance, badges and group leader boards. The bonus point initiative did, however, show positive effects and the students could see the added value of bonus points when it comes to motivation to study and analyze the course material.

The response rates on the course survey were also very low, limiting its value and making it hard to draw any definite conclusions. To some extent, the interviews compensate for this when it comes to student perceptions.

## VII. CONCLUSION

This study aimed to investigate the use of bonus points as a motivator for increased engagement in course activities in a theoretical course in higher education. According to the results, we found that awarding bonus points in the course seminars had positive effects on students' learning motivation and engagement, as well as students' achievements on the final course examination. The students with the highest awarded bonus points from the course seminars were likely to obtain higher grades in the final course examination, even without the bonus points being added to the final exam result.

Some future research directions have been identified. First, it should be rewarding to use the self-determination theory more closely in the actual course design. This would provide a more solid theoretical ground. In the research presented here, the theory was mainly used to discuss and interpret the results. Second, another direction is to study the use of bonus points in a more practical-oriented course in higher education. This study would provide some insights on awarding bonus points in different course settings and provide opportunities for comparisons.

It would also be interesting to conduct more longitudinal studies, possibly including several courses in a program, to study differences and changes in student perceptions. To the best of our knowledge, this kind of study has not been performed to date. This kind of study may provide important insights for teachers about the influence of bonus point systems

as well as deeper insights into its effects in different types of courses.

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