Can You Tell by My Grades That I Am a Blogger?
A Longitudinal Study of the Use of Blogging as a Pedagogical Tool and Effects on Expected Grades

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Abstract: From 2009 to 2013 writing blog posts, and commenting on each other's blog posts, was a mandatory course requirement for the students of the subject ØMF101 Administrative Informasjonssystemer (Management Information Systems) at the former Bergen University College (now Western Norway University of Applied Sciences). We have data from the students' activity on the blog network, combined with grades and demographic data. This makes it possible to explore the effects of blogging, and on a higher level, digital based active learning, has had on the course outcome. The results show that older students are less active digitally and get lower grades than younger students, even when compared to average grades for the bachelor program. All other effects are small or non-existent – including the relation between blogging activity and exam results.

1 INTRODUCTION

The phenomena of blogging emerged in the late nineties together with the accessibility of the internet for casual users. Arguably it was identified as a genre of its own early in the new millennium (Blood, 2000), and a part of the emerging Web 2.0 (Berners-Lee, Dimitroyannis, Mallinckrodt, & McKay, 1994). The ease of use and interactivity made blogging an interesting topic for research within higher education.

2 LITERATURE REVIEW

2.1 Current Research Topics and Methods

A literature review conducted in 2010 found two groups of research: blog usage profile and the effects of blogging (Sim & Hew, 2010). The group researching effects of blogging were separated into two categories: Effects of blogging on performance outcome and effects of blogging on affective outcomes. Both categories relied on student's self-reporting and/or analysing contents of blogs. Some studies reported an elevated perceived level of

reflection as a result of both blogging, and reading other students blog posts (Xie, Ke, & Sharma, 2008), and in most cases the students perceived that blogging did support their learning. In the other category most student self-reported positive attitudes towards blogging (Ellison & Wu, 2008).

The research we have found on the subject of blogging in higher education have for the most part been based on self-reporting from students on their perceived experience after blogging, for the most part during one semester ((Ellison & Wu, 2008),(Kiliç & Gökdas, 2014),(Song & Chan, 2008),(Halic, Lee, Paulus, & Spence, 2010) to name a few), some research goes as far as documenting effects over two semesters (for example (Yang & Chang, 2012) and (Kuo, Belland, & Kuo, 2017)), but we have not seen any longitudinal studies on the subject.

There are some studies that test students' knowledge level before and after a blogging experience, for example (Papastergiou, Gerodimos, & Antoniou, 2011). The study showed no significant increase in the students' skills in the course taught, in the case, basketball skills.

In a broader context it is possible to classify blogs as social media. If we look outside the research of blogging as a tool for learning, we find a study done on the effects of using Twitter as a learning tool in

higher education (Junco, Heiberger, & Loken, 2011). The study looks at both student engagement and grades, using both an experimental group and a control group. The conclusions were that the experimental group, the group using twitter, were more engaged and got better grades than the control group. The study lasted one semester, and compared both acceptance grades, average grades for the students across all subjects with the grades for the specific subject where the students used twitter.

2.2 Recommended Frameworks for Educational Blogging

A framework for student bloggers and educators is described in (Kerawalla, Minocha, Kirkup, & Conole, 2009). The first part of the framework consists of an over-arching technological and pedagogical context for blogging, where it is important to clarify the relationship with other e-learning tools provided in the course, discuss functionality of the blogging software, and how the blogging fits into the requirements of the course (e.g. is it a course requirement). The second part of the framework deals with developing blogging behaviour and skills for students based on the audience, the blogging community, comments and the presentation of the blogs.

The framework is based on interviews of 15 students on master-level online course. For each part of the framework the researchers have made several questions adapted from those interviews. For example, regarding the audience, one question will be: Who is my audience? For the relationship with other e-learning tools, one question will be: What will blogging offer that other tools will not? The researchers offer the framework to guide and encourage educators to think about how they best can use blogging on their course.

Another case study (Farmer, Yue, & Brooks, 2008) presents blogging as a learning tool in a large cohort university class. Blogging was introduced as a formative assessment exercise, for 30% of their final assessment grade they were asked to maintain a blog for 12 weeks during a semester. Both posting a blog post, at least once a week on average, and interaction with other students' blog were parts of the requirement. The researchers used a wide range of data collection methods, from statistics from the blog network, content analysis of blog posts to online and paper-based questionnaires.

A dashboard containing blog titles, number of entries (blog posts), views and number of comments were available to students during the period they were

blogging. In conclusion the researchers find that there is promise in using blogging for learning, but also problem areas in need of improvement. There are also some recommendations for good practice. Amongst the advice are: To be clear about the formative assessment, ensure adequate technical support, build early interactivity into the experience and making some of the transition support activities explicit and easy for students.

There has also been some research on how blogging should be integrated in higher education pedagogy. In a study that included both surveys, logs from the blog platform and content analysis of the blog posts it was concluded that the three inter-related factors of frequency, topic resonance and timeliness determined the effectiveness of moving students toward a blogging practice (Freeman & Brett, 2012). Prompted entries were more frequent than unprompted, prompted topics helped the students write blog posts, and several students wrote blog posts in a "catching up manner" before deadlines.

2.3 Blogging, Student Engagement and Learning Outcomes

Several of the studies above report a positive attitude amongst students towards blogging. Interactivity amongst students, and between students and lecturers is made possible by the comment feature found on blog posts. There is research suggesting that students using technology are more engaged in their work as students, for example students using electronic voting systems (King & Robinson, 2009) and educational games (Annetta, Minogue, Holmes, & Cheng, 2009). Also, studies have found a positive correlation between the use of social media and college student engagement (Heiberger & Harper, 2008).

Student engagement can be defined as *the amount of physical and psychological energy that the student devotes to the academic experience* (Astin, 1984). Later, (Kuh, 2009) have defined engagement as the time and effort students invest in educational activities that are empirically linked to desired college outcomes. College outcomes, or learning/student outcomes are subject to much uncertainty in the literature (Allan, 1996), we argue that engagement and reflection are amongst the desired outcomes, but for students' good grades must certainly be a desired outcome as well.

But, are there any empirical links between blogging as an educational activity and grades as a desired outcome in higher education?

3 RESEARCH QUESTION

During our literature review we have encountered very little research that explores if it is possible to tie blogging as an educational activity to better grades in the course utilizing this activity. Furthermore, the available research is based on experiences from one or two semesters, and the research that examines grades in connection to social media focuses on the platform Twitter, and not blogging. Our research focus is the effect blogging might have on grades in courses where students are academic bloggers. Our research questions are as follows:

Are there any group of students that experience higher grades as a result of using blogging as an educational tool?

Does higher activity on a blog network lead to higher grades?

4 DATA AND METHODOLOGY

The data used in this analysis is based on a BSc course in Management Information Systems. Over a period of 5 years, between 2009 and 2013, blogging was a mandatory part of the course. This included writing own blog posts on relevant subjects, but also commenting on other's posts.

4.1 Blogging as a Platform for Learning

Several factors contributed to the decision of using this learning method in this course. First, one of the main subjects of the course was information systems. The blog network in itself is a system, and thus represented an opportunity for the student to have hands-on experience as users of a system, in addition to using the blog network as an example of more technical aspects of the course, like databases and application architecture. A forum could also enhance activity between students, it would have been possible using the forum functionality in the LMS Itslearning, but that functionality was considered less engaging, and would not have made the point about the application architecture in the same way, hence a forum was not chosen for student interaction.

Clarifying this relation between the course subject and blogging answers some of the suggested questions proposed by the Kerawalla et al-framework (Kerawalla et al., 2009). The project was heavily also inspired by activity-based learning, using writing as a

tool for learning, and learning by peer-review (Xie et al., 2008).

4.2 Blog Technical Setup

The technical installation and maintenance of the blog network was done, not by the institution's IT-department, but by the media department. The allocated resources at the media department ensured adequate technical support, an advice suggested by Farmer et al (Farmer et al., 2008).

Through the system, each student signed up for a personal Wordpress-blog, and by using Buddypress[1] the personal blogs were connected in a community/blog network. That way, the students would get a feed of each other's blog posts and comments. As participating in the blog network was mandatory, it needed an easy and transparent way to see if each student had filled the requirements. This was solved by making a dashboard showing each student's number of blog posts and number of comments. The dashboard was similar to the dashboard presented by Farmer et al, and the clarification of role of blogging as a formative assessment is in accordance to the Kerawalla et al-framework.

It is also worth mentioning that for this course, the blog network also was the main LMS (Learning Management System). All the material for each lecture was presented within a blog post/update by the lecturer, including a description of the lecture, reference or link to relevant literature and articles, and often an embedded video for using a flipped classroom-approach in the lecture. This way the students had one main platform to deal with during the course. This is in accordance with Kerawalla et al's suggested overarching framework where clarifying the relationship with other e-learning tools is an element.

4.3 Blog Content and Comments

The students were somewhat free to choose the subject of their blog posts, if it fell within the theme of the course. Suggested, or prompted (Freeman & Brett, 2012) topics (by the lecturer) included discussing experiences as users of business software, discussing blogs and other social media supporting value creation for companies, blogs about the blogging learning experience, discussing different themes from the course, making a report from a guest lecture, or summarizing a chapter from the course literature. As for the comments there were no recommended structure for leaving comments, other

than the required number. A more formal structure might have improved the learning and influenced grades.

The mandatory requirements for the first year of using the blog network, 2009, were as follow:

- 2 blog posts, minimum 200 word
- 10 smaller blog posts/sharing an interesting link with comments on why it is relevant
- 40 comments on other student's blog posts

The lecturer also made a commitment to comment on all blog posts, thus building early interactivity as per Farmer et al's advice. The students reported via a survey, not included in this paper, that participating in the blog network led to a better understanding of the subject, about 90 % answered agree and somewhat agree on a survey conducted after the subject was completed. The lecturer subjectively noticed higher levels of enthusiasm for the course amongst the students than in the pre-blogging versions of the course.

The next year, 2010, the requirements were modified:

- 2 blog posts, minimum 200 word
- 3 smaller blog posts/sharing an interesting link with comments on why it is relevant
- 10 comments on other student's blog posts

Apart from these minor adjustments of the requirements the course remained the same throughout the period, with the same curriculum, the same lecturer, and the same evaluation criteria. Also, the setup and use of the blog network as an educational tool was in accordance with parts of the Kerawall al-framevork, Farmer et al's advice and Freeman and Brett's factors towards effective educational blogging, which should improve the potential for desired learning outcomes for the students from the experience.

5 METHOD

The student numbers varied somewhat from year to year, between 55 and 96. In total, 394 students attended the course throughout the period.

We have a complete quantitative overview of the blogging network activity based on student ID numbers. Hence, we know that, for instance, student X made 4 blog posts in total, and wrote 9 comments to others' posts. We also know which posts these comments are replies to – including what student wrote the original posts. Although not the main topic of this paper, it is worth noting that this allows us to

perform a network analysis of student activity, for instance studying which students comment on each other's posts.

Also, for this study the contents of the blog posts and comments have not been analyzed. An idea for a later study would be to use Natural Language Processing for further insight into the blogging experience.

Neither posts nor comments provides perfect information of true student activity. Reading others' blog posts could be useful for learning but is not counted as activity here. Not all posts and comments are equally important or thoughtful, and it would of course also be interesting to measure other activities related to the blog network (number of page views, total words written, etc.) Finally, time stamps on the posts and comments could also been useful, for instance to separate those who are active throughout the semester from those who fulfill the activity requirements during a few hectic hours before the deadline.

As mentioned above, in this data set we have no qualitative information about the posts/comments. Partly because of this, we use *received comments*, rather than posts, as a variable in the further analysis. The logic is that extensive and/or particularly relevant posts tend to attract comments. Other posts, written in the last minute to fulfill course requirements, and maybe containing little else than a link to a semi-relevant web page, will typically not receive comments.

Hence, for the purpose of this study, we use *number of written comments* and *number of received comments* as the two variables expressing activity in the blogging network.

One novel aspect of this study is that we have been able to merge this data set with administrative data on the students, in the same manner as (Junco et al., 2011). This data set includes information for the admission process (age, gender and average high school grades), but also information about grades in this specific course, as well as each student's average grade for the degree. We started this project only when all relevant students had graduated, and hence have access to average degree grades for all students.

What we are particularly interested in, and have used as a variable in this study, is the difference between grades in this course and the average degree grade. This difference will of course reflect that some students are particularly good at this subject, whereas others are better in other subjects. There will also be some noise – students can be «lucky" or "unlucky" with the exam and the grading etc. However, in addition to this, we also believe that this difference

says something about the effects of blogging. All other courses were taught in a fairly similar and conservative way, with this course being the only one using educational blogging. If some types of students systematically perform better or worse in this course than in other courses, we think that the teaching methods will be a likely explanation.

In total, this gives us a data set we consider to be very good, with the following information included:

6 ANALYSIS

A simple correlation analysis is a useful starting point – the results are shown in the correlation matrix below:

Table 1: Illustration of data set.

Student#	Course grade	High school grade average	Degree grade average	Difference, course grade minus grade average	Received comments	Sent comments	Age	Gender
1	4	4,68	3,23	0,77	39	17	21	1
2	3	4,32	3,79	-0,79	43	68	21	1
3	4	4,69	3,09	0,91	57	79	22	1
4	2	4,72	2,31	-0,31	34	26	25	1
5	4	4,81	3,71	0,29	39	65	21	1
6	4	4,58	3,91	0,09	39	29	22	0

Table 2: Correlation matrix. N=394.

	Course grade	High school grade average	Degree grade average	Difference, course grade minus grade average	Received comments	Sent comments	Age	Gender
Course grade	1,000							
High school grade average	0,318	1,000						
Degree grade average	0,763	0,103	1,000					
Difference, course grade minus grade average	0,589	0,340	-0,073	1,000				
Received comments	-0,005	-0,059	0,005	-0,013	1,000			
Sent comments	0,113	-0,006	0,062	0,097	0,670	1,000		
Age	-0,252	-0,411	-0,155	-0,194	-0,131	-0,135	1,000	
Gender*(male=0; female=1)*	0,087	0,224	0,072	0,045	-0,036	0,042	-0,021	1,000

Some of the results are obvious and require no further explanation. For instance, students receive better grades in this course if they had a good grade average in high school, and there is also a very high positive correlation between average degree grades and the grade in this course.

Other correlations are more interesting. Age is negatively correlated with everything else, both performance and measures of blogging activity. The correlation with performance is in line with previous internal studies. The negative correlation with blogging activity is not that surprising – one would hypothesize that younger students at the time were more familiar with and interested in blogging.

There is a strong positive correlation between number of sent comments and number of received comments, confirming our idea that those students who are active commentators to a large extent are the same students writing blogposts that attract comments from others. However, it is interesting and slightly surprising to note that the correlations between blogging activity and the different performance measures seem very small. One would expect that time spent writing good blogposts attracting comments as well as commenting on others' posts somehow would translate into better grades.

Next, we performed a simple regression analysis. The course grade is here the dependent variable, whereas measures of blogging activity and demographic variables are independent variables. Note that from the table above, the variable "Difference, course grade minus grade average" is excluded from the regression, as this is a direct function of two other variables. Also, note that the regression is based on only 320 observations, as one variable (or more) is missing for the last 74 observations. Most often, this is the information about high school grades. As far as we have been able to observe, the missing data are missing at random, and should hence not affect out conclusions.

The results are shown in the table below.

Again, it is not surprising to observe a strong effect from both high school grade average and degree grade average. What we find slightly surprising is that none of the other variables seem to have a significant effect on course grade. Older students typically have lower grade average from high school, and also get lower grades throughout their degree. Thus, when this is accounted for, it seems reasonable that age does not carry an additional effect on its own. However, we are surprised that blogging activity (measured by sent or received comments) not seems to affect the course grade at all, after adjusting for these other demographic factors.

One hypothesis could be that while having little effect for most students, the blogging worked for those who really focused on it. Hence, we looked closer at the data for the top 5% measured by comment activity (n=16, students sending >58 comments). It is of course difficult to conduct meaningful statistical analysis for such a small sub-sample, but we were still somewhat surprised to see that no interesting relationships could be detected. This group got slightly better grades than the average, but again, this could be explained by their better high school grades and average grades. In fact, the most interesting observation was that this group consisted of 14 female and just 2 male students.

Table 3: Regression analysis. N=320.

	Coefficient	*Standard error*	*t-Stat*	*P value*
High school grade average	0,357	0,129	2,777	0,006**
Grade average	0,783	0,072	10,888	< 0,001***
Received comments	-0,001	0,004	-0,367	0,714
Sent comments	0,004	0,003	1,156	0,248
Age	0,027	0,026	1,035	0,301
Gender (male=0; female=1)	0,078	0,084	0,928	0,354

7 DISCUSSION AND CONCLUSION

We expected to see an effect of blogging activity – mainly because this activity is directly related to the course objectives, but also through other, more indirect mechanisms. For instance; the course was about management information systems (i.e., IT) – a reasonable expectation would be that students with a particular interest in this topic would be more active bloggers, and also get better grades in the course than expected based on high school grades or average grades.

However, no such effect can be detected, not even among the sub-sample of very active bloggers. Our research questions were:

Are there any group of students that experience higher grades as a result of using blogging as an educational tool?

Does higher activity on a blog network lead to higher grades?

The results show that the answer is no to both questions.

This is interesting for several reasons. While previous literature (for instance Farmer *et al*, 2008) indicate that blogging is perceived useful by students, our study suggests that this not necessarily translates into better «hard» results as measured by course grades. We believe this is a useful observation throughout much of the literature on pedagogical methods – tools that are perceived to be motivational and effective by students and/or instructors are not necessarily the same tools that improve learning as measured by exam results. This does not imply that tools and methods which "only" improve student (or teacher!) motivation or perceived learning without significantly improving grades should be discouraged. Increased motivation and course satisfaction are goals on their own, and of course, experimenting with different methods in different settings is also valuable on its own. However, a clearer definition of what qualifies as «successful» when using new pedagogical tools could probably be useful.

Another interesting point is how we measure learning –in this case, how the exam is structured. The exam type remained unchanged as blogging was introduced. A possible objection would be that the exam should be changed to better reflect the methods used in the course, or that blogging *per se* not should be expected to improve exam results when the skill set required in a traditional written exam probably is different from the skill set required for (and promoted by) blogging.

Finally, it is worth reflecting on how different practices appeal to different groups of students. In our case, blogging seemed to appeal to younger students more than older students, and to female students more than male students. Of course, this could be good or bad, but nevertheless worth considering and measuring when possible.

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