USING BLOGS FOR LEARNING LOGS

Martin Homik (Saarland University), Erica Melis (DFKI)

Abstract. In general, students leave a course and do not continue to reflect on its content. Therefore, learning gaps are neither identified nor closed. Studies showed that paper-based learning logs that target cognitive and meta-cognitive processing by prompts can overcome this deficiency. We conducted an explorative study with electronic learning logs based on the blog function of the e-portfolio system Elgg. Results indicate that using blogs for learning logs are well accepted by students but the cost-benefit ratio related to time investment is considered too high.

1. Introduction

In general, students forget a course's content rather quickly, if they do not work with it actively. In fact, most students leave a course and continue to deal with the course's contents only if they have to. Just a few interested students spend time for reflection on the seminar sessions. A personal organisation of learning content, thoughts, and critical reflections is usually not present, although it should be one of the results of higher education. This situation results in learning gaps that are neither noticed nor closed. Hence, the lack of comprehension and a poor long-term retention is a direct consequence.

Learning logs in e-portfolios as an active part of the course can overcome this deficiency. However, naive learning logs prove to be inefficient with respect of memorisation and understanding. Students following this type of learning log do not address cognitive and meta-cognitive questions which are necessary for self-organisation and self-assessment [9].

Learning logs with prompts can guide students by asking questions. Prompting means question answering. It is a simple method for helping students to activate background knowledge, i.e., to bring to mind and state, write down, or otherwise record what they know. A review by Pressley et al. [11] builds a strong case for the hypothesis that question answering approaches can increase learning. After reviewing a large number of research studies, they conclude that asking students to generate explanatory answers to questions about content to be learned can facilitate learning of the material.

Many studies have been conducted with paper-based learning logs (see §2). To our knowledge, there are no studies on learning logs based on blogs. In this article, we describe an explorative study based on experiments conducted with the blog-based e-portfolio tool Elgg (http://www.elgg.net/) within the scope of two seminars. The goal of the experiments was to investigate the usage and acceptance of blogs as part of an e-portfolio tool for writing learning logs, the effects of learning logs on retention and comprehension, and the effects of prompted learning logs compared to naive learning logs.

2. Related work

Gallin and Ruf [3] emphasise the importance of documentation and presentation of core ideas by the learner in his own words. They empirically validated traditional (paper) learning logs with students in primary school as well as in secondary school [2]. Further pedagogy researchers, e.g., Mayr [7] and Plamenig [10] investigated the use of paper learning logs with students from different educational

levels. Their results show that learning logs help to strengthen learners' autonomy and support their meta-cognitive reasoning such as planning, reflecting, looking back, memorising, and exploring different viewpoints in a situated way. Berthold et al. [1] showed in an experiment with psychology students that prompting fosters cognitive activities, comprehension, and retention.

This observation motivates the integration of electronic learning logs in any e-learning environment, and in particular in e-portfolio management systems. People write electronic diaries for a long time and with the emergence of blog systems writing electronic diaries found a new popular platform [5, 4]. Schmidt investigated the German blogosphere [13] and in particular he examined in a sub study the motivation and behaviour of so-called knowledge bloggers – people who like to report to the public about their current work, research ideas, or learning progress in their blog [12, 14].

Homik and Melis describe an implementation of a learning log [6] for ActiveMath [8]. It allows to associate entries with particular learning items in ActiveMath. Type-specific prompts allow students to store input with semantic annotations. For instance, students can grade their performance, point to learning items they (did not) understood, list resources they considered helpful, etc. This framework potentially enables the overall learning system to analyse the users' self-identified abilities and deficiencies. It can detect inconsistencies between self-assessment and the beliefs of ActiveMath's learner model.

3. Research questions

We investigated the following research questions and hypotheses:

- To what degree are blogs accepted as reflective tools in short-term learning? How useful are blogs in a seminar? How much blog activity is devoted to discussion and collaboration?
- Do students believe that their performance increased by using learning logs?
- How do students reflect when they can write logs freely without being guided by prompts? What kind of issues do they address? What do they omit when not prompted?
- We expect an increased motivation to blog if student's know that their blogging activity is graded.
- We expect a better performance in the post-tests for students who were instructed to use prompts.
- We expect that students who write free learning logs switch to the prompt schema after the second session.

4. Experiments

The first experiment was set up for a weekly seminar, the second for a block seminar. In both experiments we used Elgg as a discussion and reflection tool. Before the seminar, students were instructed that the quantity and not the quality of their participation would influence the final grade. Moreover, we promised to follow their logs regularly and, in case of misunderstandings or questions, to provide clarification and answers. Feedback was given from researchers from our group and partners of our EU project LeActiveMath. To experience the use of Elgg in this setting and to provide examples on how to use Elgg, the first author participated in both experiments under the same conditions the students had. After each seminar, the first author questioned students via e-mail when unclear points occurred.

4.1 First experiment

4.1.1 Setting

The first experiment was conducted in a weekly seminar *Hands-on mathematics for computer scientists* in the winter 2005/2006. The seminar's topic was about technologies for mathematics learning. Students had to prepare a series of short presentations and to deliver small programming projects. The seminar included the work with ActiveMath, a learning environment for mathematics, which is being developed by our research group. Since bugs were still likely to occur at that time the students were asked to report and describe them in a blog.

Nine computer science students started but only five finished the seminar. The students were asked to use a local Elgg installation for maintaining an individual e-portfolio, recapitulating the seminar sessions and presentations, reflecting on their own performance, and discussing with all participants (see http://elgg.activemath.org/). We instructed the students once to answer the following questions:

- What was the last session about?
- What did you (not) understand?
- What did you like/dislike?
- Summary of the session

4.1.2 Results

In the beginning, students did not volunteer to reflect in a blog. They explained that they were not used to this and did not want to invest extra effort. Only after announcing that the quantity of their blogs will contribute to their grades most of them started to write. Usually, they wrote one blog entry per week. Entries consisted mostly of a brief summary which sometimes also included bug reports they encountered in the ActiveMath system.

In general, the tutor was the first who wrote a detailed public entry some days after the seminar session. Chances were high that students copied some of his statements. They admitted that they wrote an entry just before the next session and realised that they already forgot the last session's content. Therefore, they might have read the tutor's entries before they wrote theirs.

Unfortunately, the students never introduced other topics than their reflective entries. Moreover, they rarely commented the tutor's entries and never those of their fellow students.

For quick communications, the students and the tutor used e-mail communication. It was much more convenient than writing blog comments and waiting for answers. Only if the content of an e-mail became interesting for others the tutor put it into the blog.

Some students created their own communities – a function specific to Elgg – but the tutor was never (made) aware of this.

In the last third of the course, the tutor asked students to upload all their course work into their e-portfolio. Again, they were rewarded with a slight improvement of their grade. After a while, the tutor noticed a nice change in behaviour: in the beginning, the students had sent the tutor their work for the next session via mail. Later, he wondered why they stopped. He found out that they uploaded their work into their e-portfolio files folder and expected that the tutor would inspect it anyway. Only two were so kind and announced their uploads in their blogs. In the context of a learning platform, where the participants do not meet each other face to face this is acceptable. But for a tutor, extra steps are involved, because he has to look into the students' file folders. Receiving their work via email is a bit faster since it is delivered "into his hands" and he only needs to open it. A notification or watching mechanism might be useful.

In the final seminar session, the students stated that they appreciated Elgg as a reflective tool. It helped them to remember facts or to pick up ideas expressed by others. However, they would not use an e-portfolio for each subject. The reason is not the appropriateness of a subject. Rather, the obstacle was

the time they had to invest for keeping a reflective blog. If they had to use a blog, they would focus on some selected subjects. The tutor himself made the same experience: it took him two hours to write a good, reflective blog entry because he had to think about the questions raised during the seminar, to talk to his colleagues, and to publish the answers in the blog. During the two months after the end of the seminar nobody added any new entry into the blog.

4.2 Second experiment

The first experiment yielded first data and helped us to set up a more controlled second experiment whose conditions would be more significant wrt. our the hypotheses and research questions.

4.2.1 Setting

The second experiment was conducted in a three-session seminar on *Intelligent Tutoring Systems* in summer 2006. The participating students were assigned to read publications on intelligent tutoring systems and to present the key ideas in a 30 minutes talk plus 10 minutes discussion.

Ten computer science students attended the seminar. The first two sessions included 4 presentations each. For supervision, a tutor was assigned to each individual student. Altogether, there were 7 tutors (Table 1 list the first author of this publication as Tutor 1). To answer our research questions, we arranged the students into two groups. Prior to the blogging activity, the groups received different instructions via e-mail.

The first group was instructed informally to write a review of minimally 300 words for each talk containing a summary and a description of their impressions thoughts, ideas, and assessment.

The second group was instructed to answer the following given questions. They base on the prompt framework introduced in [1]. The first three questions target cognitive processing, the last three questions target meta-cognitive processing.

1. *Organisation.* What is the story line of the talk? Describe the motivation, the goals, and the path to the goals.
2. *Elaboration*. Make up own examples, counter examples, or illustrations. Did you come across the presented techniques in a different context? If yes, where?
3. *Critical reflection*. What did you find interesting, useful, convincing, inspiring? Is there anything you criticise?
4. *Monitoring*. What did you not understand about the talk?
5. *Self-diagnosis.* What is the likely reason?
6. *Self-regulation.* How would you overcome your deficiency?

Post-tests. In the beginning of the second and third session, we selected two presentations of the last session and asked the seminar students to recall the presentations' key ideas. They had 15 minutes to write a report.

4.2.2 Results

In this section, we first evaluate the second experiment in general. Then, based on the results, we investigate the research questions and hypotheses.

General evaluation. Right from the start, it was announced that the blog activity would contribute to the final grade for the seminar. We expected that students would write blog entries without delay.

User	Number of		After Session			Entries in English
	Entries	Comments	1	2	3	
Group 1						
User 1	8	5	1	2	5	1
User 2	2	1	0	0	2	0
User 3	7	3	0	7	0	0
Group 2						
User 4	1	1	0	0	1	1
User 5	12	4	0	1	11	12
User 6	6	5	2	0	4	5
User 7	4	2	1	1	2	4
User 8	2	0	0	0	2	2
User 9	2	10	2	0	0	0
User 10	0	0	0	0	0	0
Tutors						
Tutor 1	12	23	1	8	3	1
Tutor 2	1	0	1	0	0	0
Tutor 3	0	0	0	0	0	0
Tutor 4	0	0	0	0	0	0
Tutor 5	0	0	0	0	0	0
Tutor 6	0	0	0	0	0	0
Tutor 7	0	0	0	0	0	0
	Total	**Total**	**Total**	**Total**	**Total**	**Total**
	57	45	8	19	30	26

Table 1: Second experiment's blog usage (Tutor 1 is the first author)

Unfortunately, due to technical problems with our e-mail system most students did not receive the exact instructions on how to use the blog and how to publish in the blog in time. Thus, only three students blogged between the first and second session (9 blog entries in total, 2 by tutors). The blog activity increased between the first and second session (19 blog entries in total, 8 by tutors) but most blog entries were added on the day of the third session (9 blog entries in total). This is in line with the experience from the first experiment. After the third session and until the closure of the blog one month later, 30 blog entries were posted of which only 3 were authored by a tutor.

A detailed analysis of the blog activity in the second experiment is shown in Table 1. For each user (student and tutor) it lists how many blog entries and how many comments she/he has published. In summary, there were 57 blog entries of which 24 were commented by 45 comments in total. Four entries were open questions, 19 entries were announcements, and 43 entries were summaries. Two open questions were followed-up by 9 comments and two announcements received by 5 comments. In general, commented entries had two to four comments. They were mainly answers to questions or issues raised by the first tutor. Students rarely commented their fellow students' blog entries. Usually, they watched for comments on their own blog entries and answered those.

Only three students (User 1, 5, and 6) posted and commented quite often. An explanation is that they followed own interests. One student is writing his bachelor thesis in our group; the second was interested in a good final grade and blogged, because "it was part of the seminar" and because he

wanted to “make a good impression”; and the third tried to improve his grade because his presentation was quite bad.

Most blog entries were extended summaries plus a few sentences about the presentation itself. Although not required, six students posted partly in English (most popular foreign language in Germany). There were 25 entries in English. Four students wrote all their entries in English (User 4, 5, 7, and 8) and one student (User 6) wrote all but one entry in English. This is remarkable as students usually prefer their native language (here: German) for communication.

It was striking that students carefully criticised the presentations. They suspected that bad presentations might have been a consequence of bad or superficial publications, of the circumstances (being excited, last talk of the day, hot weather), or a lessened concentration.

Some students pointed out that the presented slides were not published on the seminar’s web page and appealed to their fellow students in the blog to upload all presentation slides into the community e-portfolio folder in Elgg. They hoped to get an opportunity to glance at the slides and recall the presentation before writing a blog entry about the presentation. In the end, only three slide presentation were uploaded into the community blog.

Although the students appreciated the idea of reflection and learning logs they disliked the setting of the seminar. They criticised the blog entry overload as everybody had to reflect on a presentation. They lost the overview, and reading and re-reading the same thing was boring and decreased motivation. Finally, the lack of notification hindered the activity of the blog.

The students’ motivation to blog was rather low. They did it, because it was expected and it was part of the grade. As opposed to this, students appreciated a blog as a learning environment for recapturing presentations, discussion, and lectures in general. They valued the opportunity to read other peoples’ views. However, the cost-benefit ratio was considered too high.

To what degree are blogs accepted as reflective tools in short-term learning? How useful are blogs in a seminar? How much blog activity is devoted to discussion and collaboration?

In both seminars, the majority of students confirmed that using blogs for learning logs is a useful tool for learning. Among others, they appreciated blogs as means to recall and memorise learned material, to structure and organise own thoughts, to read about their fellow students’ views, and to exchange and discuss raised open questions and opinions.

Compared to other seminars, where students were asked to write a summary of their own presentation, we asked our students to write summaries of all presentations. Consequently, as the students stated, this helped them to pay more attention during presentations and to get a broader overview of the seminar’s content, because they were forced to deal with it in the blog. Also, they liked the comment function which enabled to ask them or answer questions.

On the other hand, the students criticised the usage of blogs. Writing summaries is time-consuming. The students wrote blog entries because they thought they were supposed to do so. In fact, as soon as the first seminar ended, no student continued to use it.

A key critique of the current Elgg version is the lack of workflow functions such as the notification via e-mail when blog entries or comments are inserted. In principle, notification for new blog entries can be handled by using RSS feeds. Depending on the RSS Reader (e.g. Thunderbird), the interested user can see at once when new blog entries are available. A user who uses no RSS Reader has to look up the blog regularly. One student suggested, if the seminar’s main purpose was to stimulate online collaboration and discussion, then, it would be much more efficient to use a forum, which can be set up to signal the student that a new post or answer to a post has arrived. Moreover, forums are more concise as they offer a hierarchical view on the topics.

User	Talks			
	1	**2**	**3**	**4**
User 1	weak	weak	n.p.	n.p.
User 2	-	good	-	-
User 3	good	-	n.p.	n.p. (x)
User 4	weak	weak	weak	weak
User 5	good	good (x)	good	good
User 6	good (x)	good (x)	n.p.p.	n.p.p.
User 7	weak	good	n.p. (x)	n.p.
User 8	-	weak	n.p.	n.p.
User 9	good	-	-	-
User 10	-	-	-	-

Table2: Results of post-test. n.p. means 'not present', n.p.p. means 'not present in previous session', - means 'not answered', (x) means 'own talk'

Do students believe that their performance increased by using learning logs?

Indeed, those students who blogged regularly believed that their performance increased but this cannot be fully confirmed by the post-test results. For instance User 1 was very active in the blog and wrote a detailed summary to each presentation. To do this, he even read all provided scientific publications. However, his first post-test results were weak (see Table 2). An explanation is that he intensified his blogging activity just after the third session. Between the first and second he wrote only a blog entry about his own presentation which was not tested in the post-test. Since he was not present in the last session, we cannot say if he would have improved in the second post-test.

But altogether, we can state that those students who blogged actively dealt in depth with the seminar's topic and gained a broad overview which is documented by their blog entries.

How do students reflect when they can write logs freely without being guided by prompts? What kind of issues do they address? What do they omit when not prompted?

In this evaluation, only three students were asked to write logs freely. User one posted quite often (see Table 1). All his entries were summaries except for one, a post about his own talk, in which he also briefly expressed his curiosity about the topic of his talk. The second student posted only twice: the first post was a general remark about the blog instructions, while the second was a summary of his own talk including a few statements that were raised in the discussion after the presentation. He did not reflect at all. The third student always added a paragraph to his summaries in which he judged the presentation. Where possible, he also described related situations in which he came across the presentation's topic and recommended further reading. His style of writing resembled the text structure induced by the special questions that were given to the second group. That is, he commented whether the presentation was comprehensive, easy to follow, logically structured, well thought, and convincing. He also pointed out what ideas were most interesting for him. Finally, he compared the presentations of a seminar session by naming the best talk of the day.

Due to insufficient and diverse data we cannot state a tendency towards a specific style of writing or reflection.

We expect an increased motivation to blog if students know that their blogging activity is graded.

We can reject this hypothesis. The students knew that blogging would be a minor part of the grade, hence, we can assume that they considered it negligible. Concerning the effort, the cost-benefit ratio was too high. Also, working with Elgg and the lack of workflow was cumbersome. Statements such as

"The Blog is too complex and too unstructured" or "I didn't know that someone commented my blog entries." underline the observation.

We expect a better performance in the post-tests for students who were instructed to use prompts.

Due to insufficient data we cannot confirm or reject this hypothesis (see Table 2). Students skipped sessions and were, thus, not present or could not reproduce anything because they missed the preceding session. We cannot even say that students who blogged quite often remembered more details than students who rarely blogged. However, we can confirm that good students who participated in the blog actively (User 5 and 6) also performed well in the post-test.

Though all students knew that the participation in the blog will be graded most did not put enough effort in it. The hypothesis that students who want to achieve a good grade or make a good impression as well as that students who are (about to be) involved in the work of our research group would be active in the blog could not be confirmed. For instance, user 2 applied during the seminar for a master thesis in our group and user 10 is a member of our group. However, both did neither post entries nor submit comments.

We expect that students who write free learning logs switch to the prompt schema after the second session.

This hypothesis bases on the assumption that students follow public entries written by fellow students guided by prompts and that they prefer to answer prompted questions in two respects:

1. Prompts give hints what tutors might expect.
2. Suggested prompts are reasonable.

The only candidate for answering this question is the third student. Hence, the data does not suffice for a generalisation. However, he pointed out that he did not adapt on purpose to any style nor did he know that other students received special questions. He combined summaries and reflections according to his own preferences.

Even if there were more students in this group it would be difficult to answer this question, because the students in the second group focused more on the summary rather than on the cognitive and meta-cognitive questions we asked. As a matter of fact, there was exactly one entry in which a student explicitly answered these questions and structured the blog entry accordingly. Thus, there were not enough entries which could serve as examples for adaptation.

Usage of Elgg by tutors. A quite interesting result of the experiment is that no seminar tutor but one posted in or commented the blog (see Table 1). A common reason was the lack of time and the effort that is needed for following activities in the blog. This observation is in line with the author's experience: sometimes, it took him two hours to write one entry, because he had to think about questions and correct answers.

One tutor mentioned that he followed the blog activities from time to time but he was not tempted to contribute. Like the students, the tutors criticised the lack of a notification function. Nobody was aware of any new (significant) blog entries or comments. As opposed to this, when a learner contacted the tutor via e-mail, he responded immediately. Finally, a tutor argued that the system was simply not "handy" enough.

Finally, the first tutor stopped writing blog entries about student presentation into the blog after the second session due to lack of time.

5. Discussion

Obviously, there is a discrepancy between the appreciation and acceptance of reflection in form of learning logs and a blog system which is used for the maintenance of learning logs in form of blogs. The cost-benefit ratio related to the invested effort and time is considered too high.

One way to reduce this ratio is to simplify the user's daily work with the system by provision of workflow facilities (e-mail notification) and more structure (thread hierarchies). But then, if collaboration is the main purpose, forum systems such as phpBB (http://www.phpbb.com/) may be more suitable than blog systems. Principally, they offer all those features which were used in our experiments plus those that were demanded by the students. Quite often, those forum systems are integrated into larger learning management systems (e.g., Moodle (http://www.moodle.org), Sakai (http://www.sakaiproject.org)) which offer many more functionalities. It is an open question whether blog-based e-portfolio systems can survive on their own or if they migrate into a larger learning management system on the long-term as it is the case with OSP (http://www.osportfolio.org/) and Sakai.

Even if workflow and collaboration problems are solved, students have to invest a significant amount of time for writing reflective entries. This might be infeasible if tutors of different lectures/subjects demand such kind of reflection and collaboration. Also, tutors usually can due to time constraints follow and answer to only a small subset of the accumulated posts. We belief that tutors will either stop using these collaborative environments, restrict legal posts to a few post types (e.g., only open questions), or leave the community to itself.

In general, to establish a sustainable and a vivid community, it must consist of members who have common interests and who are willing to share and communicate information. In fact, those users identify themselves with the community. This was not the case in our experiments. The creation of a collaborative community within a lecture seems to be forced and artificial. It is unlikely those communities become active or persistent.

Students in the second group focused their blog entries on the summary rather than on the cognitive and meta-cognitive questions we provided in the instructions. They occasionally dealt briefly with some of these questions somewhere within the summary or in a preceding or succeeding paragraph. They rarely structured their blog entries according to the questions. Only one student did so once. To provide structure prompts would be needed inside a blog. That is, whenever a user starts writing a new blog entry, questions will be added automatically. To do this, templates for blog entries are needed.

Finally, we learned that the instruction part of the second experiment's setting did not foster collaboration. The students usually focused on their own blog entry and lost the motivation to read those of their fellow students because it was essentially the same. Instead, they waited for the tutors' comments. This put the active tutor in charge of reading all entries and providing helpful comments. A slight modification of the setting that increases collaboration and relieves the tutor from an amount of work could be to ask each student to read and comment all blog entries that are related to her/his individual presentation.

So what are the consequences? Is a blog-based e-portfolio system such as Elgg appropriate for lectures? We believe that it is – despite of the negative results. It is up to the individual whether she/he decides to maintain private (or public) learning logs, and it is their decision if they wish to create, join, or contribute to a community. This is the essence of Elgg's vision of a learning landscape [15].

In addition to the students' statement that blogs are useful for reflection, we underline that, at least, the first author profited. By reading and commenting blog entries he was able to identify and close his learning gaps. He investigated open questions by interviewing his colleagues and tried to document and to publish the newly learned information. Our research group profited as well because members of

the group got in touch with users they develop software for. The students became contributors and beta-testers (first experiment) such that we were able to improve our software.

6. Conclusion

We described an explorative study using learning logs with a blog-based e-portfolio system. The two experiments we conducted indicate that the idea is well accepted by students. However, the cost-benefit ratio is very high and decreases motivation which puts e-portfolio systems to some extent in question. Future systems will have to lower this ratio by incorporating sophisticated workflow mechanisms to provide a maximum of usability. To stimulate cognitive and meta-cognitive processing in blogs prompts are required in form of template blog entries.

Acknowledgements. We would like to thank Claus Zinn for feedback on the paper.

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Authors

Dipl. Inf., Martin, Homik
Saarland University
Postfach 151150, D-66041 Saarbrücken, Germany
mhomik@dfki.de

Principal Researcher Dr., Erica, Melis
German Research Institute for Artificial Intelligence (DFKI)
Stuhlsatzenhausweg 3, D-66123 Saarbrücken, Germany
melis@dfki.de