DifferSheet: A Web-based Diary Social Network

for Primary Student's Writing Practice

Nuengwong Tuaycharoen
The Department of Computer Engineering
Dhurakij Pundit University
Bangkok, Thailand
nuengwong.tun@dpu.ac.th

Thakornkrid Thanatharapokin
DifferSheet
Bangkok, Thailand
hello@differsheet.com

Abstract—Writing is one of the most important skills that can improve other learning skills immensely. However, to improve student's writing skills requires a teacher's great affords to regularly assign essay homeworks and grade them, and response to the students in timely manners. Also, most students think that writing is a tedious work. Therefore, we developed DifferSheet, a web-based scrap-book diary, to solve these problems. A student can enjoyable compose a diary with drag and drop action, and can submit to the teacher online. The teacher can grade and approve badges for students. Our experiment with 30 primary students shows that the student's writing skills improve in terms of the number of words per diary and the duration spent in each session. In addition, the quality of the writing is also improved. Therefore, the students can improve their writing skills after using DifferSheet in only a few months.

Index Terms—writing skills, Essay, social networks, technology, STEM

I. INTRODUCTION

In December 2016, OECD announced its 2015 Programme for International Student Assessment results (or PISA score) for students from 72 countries all over the world [1]. This PISA score includes the examination scores in science, reading and mathematics. This made many Thai newspaper headlines with ranking in the 50s for Thai students in all subjects.

The PISA score is an indicator for education level among countries. This triennial assessment summarizes 15-year-old student's performance in science, reading and mathematics, and defines and aims at measuring equity in education. Rather than science and mathematics, which defined the technological development of a country, reading is also an important part. Reading is one of the most important skills in language learning and also a critical skill in learning in any subjects.

On the other hand, writing is also another most important skills that can improve reading and learning skills immensely. Reading and writing are literacy skills needed in 21st century. Both are in the process of knowledge transfer and promote analytical thinking.

We have seen many studies show that students who practice writing can do well in reading evidently [2]. The more one write the more he can read comprehensively.

Unfortunately, most students think writing is a tedious work. Writing requires researching for related information, reading the text, analyzing and synthesize the data, and summarize the thesis. Today's children would rather browse and post a status on a social network instead. There is an urgent need to excite the writing practice process.

Nowadays, one of the most popular technology on the internet is social networks, including Facebook, LINE, Twitter, and Instagram. Therefore, in 2013, we developed a web-based application, Diary Social Network [3], to respond to the needs among diary composer, who want to networking with others online. The application is developed with AJAX Technology that makes it works efficiently.

After releasing our commercialized Diary Social Network, named GatherSheet[4] , we see another useful opportunity of our product in education. Unlike other social networks, our GatherSheet allows the users to write a long essay and decorated it freely. This makes the users enjoy the writing process. Therefore, we develop more functions into our GatherSheet to suite in the education system, including teacher and student user groups, grading as badges, and homework shelves. This evolves into another website, DifferSheet[5]. We asked many schools to test our DifferSheet with their students. The students like our DifferSheet, and their writing skills are improving.

II. RELATED WORKS

Diary Social Network is a web-based application to serve diary composers, who enjoy writing a diary on a regular basis. Even though there are many weblog sites on the internet, such as deardiary.com and weblogs.com, the Diary Social Network presents itself with drag and drop features with interactive interface. The website allows the composer to write a diary online with their computer, and decorate the diary in one's own style. It provides background-paper style and free stickers for decoration. Additionally, a diary

composer can follow other composer's diary. The website is developed with AJAX Technology that makes it works interactively and efficiently.
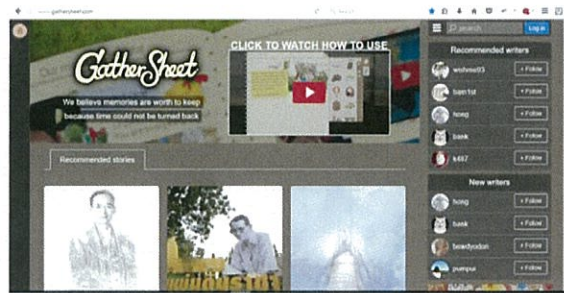

Fig. 1. GatherSheet : the Diary Social Network.

During the years, the Diary Social Network has been evolved into a website GatherSheet and DifferSheet respectively. Like Diary Social Network, GatherSheet serves well with diary composers with drag and drop features, and social network feature, such as following an author, and commenting a diary. On the other hand, the final product, DifferSheet aims at improving primary student's writing skills. Not only making writing a fun activity for grade students, the website also includes features such as submission for teacher to evaluate the student's works and statistics report to identify the student's writing improvement.
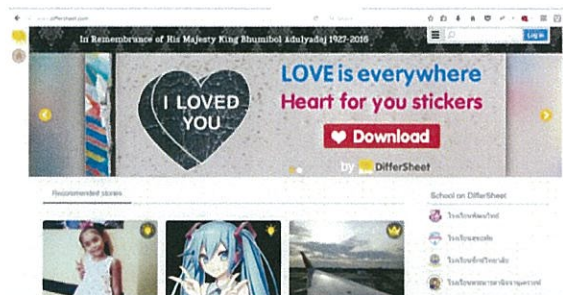

Fig. 2. DifferSheet.

III. METHODOLOGY

We have developed Diary Social Network, the web-based application with PHP, MySQL, HTML, CSS and AJAX since 2013. The core features were creating a scrap book for a diary in drag and drop action, including textboxes, images, web links, video clips, and decorating stickers. The website also allows users to follow other users and leave comments or loves for other user's diaries. In 2015, we release GatherSheet, the commercialized version of Diary Social Network.

During the years, we added more features such as user groups for teachers and students, a homework shelves for teachers to collect student's essays, and student's wall to collect badges. We name this version DifferSheet, and limit its users to grade students.

After finishing the development, we conducted an experiment with a group of 30 primary students from Suk Rue Thai School. The process of our experiment are described below:

Fig. 3. DifferSheet's Composing Diary Page.

1. We automatically generate all users in the DifferSheet System, including the class teachers and all students.
2. We train all students to create a scrap-book diary in 1-hour session.
3. We train the class teachers in a 2-hour session on how to use the teacher's shelf to grade the student's works.
4. We provide an assignment topic every week for the entire semester, including a detailed instruction for each topic.
5. We create all teacher's shelves for all homework submissions. At this point, if the teacher wants to create additional shelves, he can do so.
6. The teachers assign writing homework during their homeroom session every week.
7. At the end of the week, our grading team grades student's homework fundamentally. This will make sure that all homework is graded with the same standard for all students. This also facilitates the teachers who cannot use technology well. The grading team will grade the homework with badges.
8. The teachers approve badges, or edit the badges if needed.
9. Badges will be displayed on the student's wall. The students compete to collect badges.
10. We send each student's report card to the school every semester, and the school can send it to each student's guardian.

Because the system is aimed at primary school students, all diaries are graded with basic criteria and awarded with badges. There are 7 different badges, including Baby, Good, Funny, Beautiful, Knowledge, Creative and Perfect. Baby means this writing is in initial state, such as include only a few words. Good is any writing with more than a few words. Fun means

the writing is about a fun story. Beautiful means the diary is beautifully decorated. Knowledge means the writing is very informative. Creative means the writing and the decoration are in a creative way, and Perfect means the writing and the decoration of the diary are both excellent. These 7 badges can be grouped into 4 levels of student's competency, which are

1. Baby is the lowest level.
2. Good
3. Funny, Beautiful, and Knowledge
4. Creative and Perfect are on the top level.

The data we collect are the duration and number of words each student write in each assignment. The experimental results are in the next section.

IV. Experimental Results

We conducted an experiment with 30 primary school students during September 2016 to January 2017. The students were assigned to write a diary every week in their own spare time. Figure 4 shows the statistics for the average number of words in each writing assignment and the average duration the students spent for each writing session. We can see that the assignment numbers on x-axis are more than the number or weeks in our experiment. The reason is most students wrote more than once a week as they were assigned.
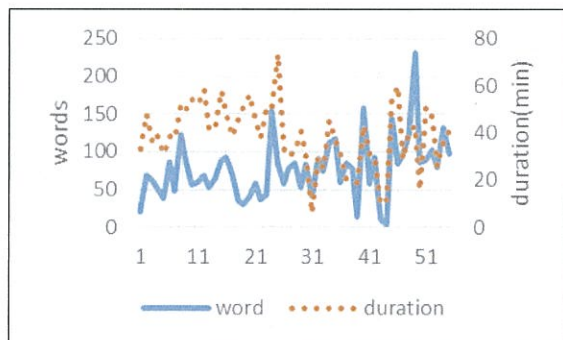

Fig. 4. Average Number of Words and Average Duration in Each Assignment.
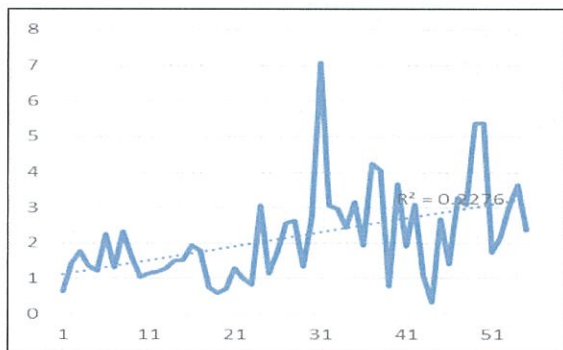

Fig. 5. Ratio between Number of Words and Duration.

We can see from Figure 4 that, on average, the students have a tendency to increase their number of words in each assignment, though they spend less time in each session. Therefore, we plot another graph in Figure 5, and we can see the trend line clearly that the students have a tendency to increase their number of words per minute they spent writing. From these figures, we can conclude that the students improve their writing skills by spending less time to compose the same amount of words per minute in an assignment.
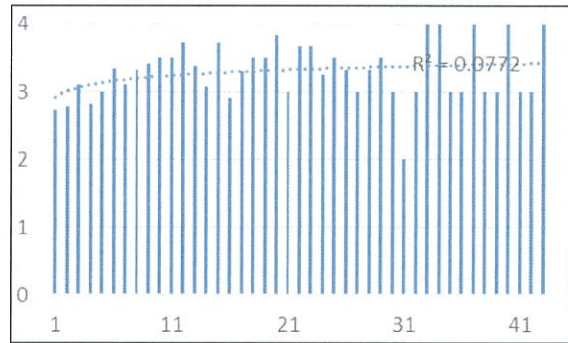

Fig. 6. Average Badges Scores.

Figure 6 shows Average Badges Scores. As we described badges and their levels in the previous section. We assigned score 1, 2, 3, and 4 to the lowest badge level to the highest badge level, respectively. Then, we calculate the average score for each assignment. As we can see from Figure 3, the students get scores between 2 and 3 in their early assignments, but the scores are rarely below score of 3 afterwards. So, we conclude that the student's writing quality is also increasing.
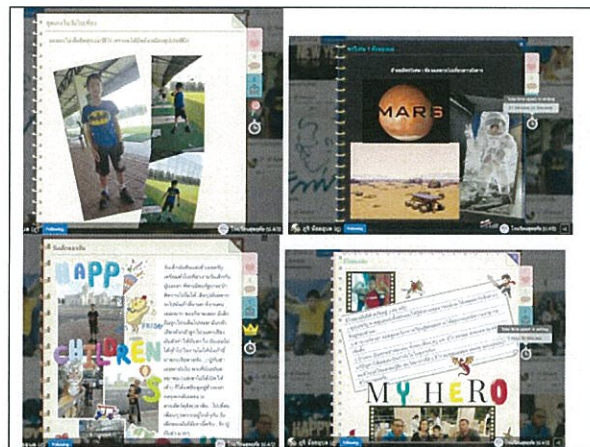

Fig. 7. A sample set of diaries of a student.

However, the number cannot tell all the stories. If we have a close look at an individual student's works,

we can see the improvement that can be measured with neither number of words nor the duration. For example, Figure 7 shows a set of diaries of a fourth-grade student. We can see that his first diary includes only a few words and a few images with only 20 minutes of composing duration. During the semester, from top-left to bottom-right, we can see the improvement. His last diary at the bottom includes a creative story, many well-thought images, and well-designed decoration with an hour and 30 minutes to compose. DifferSheet allows students to express their creativity while practicing their writing.

Noting that, in a successful classroom with DifferSheet, the teachers also play a crucial role. The teacher can select an excellent work to be a good example among students to learn from. If the teachers spend time in classroom to explain how good a diary of a student is, many students will be eager to learn and improve their writing even more. Badges are also another stimulus. Students usually compete with each other to collect as many badges as possible on their wall.

V. CONCLUSIONS

We developed DifferSheet, a web-based scrap-book diary, to help primary students improve their writing skills. A student can compose a diary with drag and drop action, and can submit to the teacher through the application. The teacher can grade and approve badges for students. Our experiment results with 30 primary students show that the number of words per diary and the duration spent in each session increase during the semester. In addition, the quality of the writing is also increased. Therefore, the students can improve their writing skills while writing on DifferSheet.

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