

**Elementary students' affective variables
in a networked learning environment supported by a blog: a case study¹**

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Abstract: This study documents to what extent writing on a blog in a networked learning environment could influence the affective variables of elementary-school students' writing. We grounded our framework more specifically in theory of self-determination (Deci & Ryan, 1985), relationship to writing (Chartrand & Prince, 2009) and the transactional theory of Rosenblatt (1991). Our research team used both pre and post-tests to measure affective variables and we conducted the analysis on the basis of inferential and correlational statistics using SPSS 17®. We also used qualitative analysis to identify writing intents and topics of blog posts. Results indicate, in particular, an increase in motivation to write in pupils who used the blog, whereas the number of comments made per post did not seem to have any definitive impact on this subject.

Keywords: motivation, ICT, relationship to writing, affective variables, networked learning environment

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1. Introduction

The learning sciences (Khine & Saleh, 2010; Sawyer, 2005) state the importance of affective, cognitive, and social dimensions in a learning environment that is learner-, knowledge-, assessment-, and community-centered (Bransford, Brown & Cocking, 1999). Learner-centered environments pay careful attention to the knowledge, skills, attitudes, affects, and beliefs that learners bring to the educational setting. Knowledge-centered environments help students become knowledgeable by learning in ways that lead to understanding and subsequent transfer. Moreover, assessment-centered environments provide opportunities for feedback and revision and what is assessed must be congruent with one's learning goals. Furthermore, community-centered environments seek to enhance social norms and interactions that value the search for common understanding and allow students the freedom to make mistakes in order to learn.

In such an environment, especially at the elementary level, learning to write is crucial not only for language acquisition, but also for academic success and development across life span (Cutley & Graham, 2008; Smets, 2010). For young writers, producing a text is a complex task that requires, on the part of the teacher, consideration for factors that contribute to the development and maintenance of motivation (Bruning & Horn, 2000). Notable among these are the importance of proposed task authenticity and taking into account the reader or addressee. Social media such as blogs are increasingly considered as being promising for their pedagogical potential (Downes, 2006; Pascopella & Richardson, 2009; Ward, 2004), particularly in regard to the community pole that offers an authentic communication context as well as a real addressee, which are important aspects of the writing process (Allington & Cunningham, 1998; Atwell, 1998; Graves, 2003). Furthermore, using tools such as these in an academic context seems to be a possible means for motivating students to write (Clark & Dugdale, 2009; De Craene, 2005; Luckin, Clark, Graber, Logan, Mee & Martin, 2009; MacBride & Luehmann, 2008; West, 2008).

However, a recent literature review has shown that few studies have systematically documented how networked learning environment (Laferrière, 1999) supported by Web 2.0 tools such as blogs can have an impact on the development of the writing processes over a full academic year at the elementary-school level (Allaire, Thériault & Lalancette, 2010).

Indeed, most studies conducted that we have taken inventory of gave an account of research carried out in the context of higher or continuing education. Moreover, many of these studies were completed over a short period of time (a few weeks), which may be a sign of a certain novelty factor coming into play. Finally, the results that we have seen pertaining to students' motivation essentially originate solely from the teacher's perception. By networked learning environment, we refer to classrooms that use computers linked to the Internet for asynchronous communication purpose. Such communication can keep written traces of interactions that pupils have between them, but also with people outside of their classroom. The networked computer is this a means to expand its boundaries. As Laferrière (1999) points out, « Si des idées et des expériences portées sur le réseau peuvent être comparées, des réactions et des réflexions peuvent alors être échangées, du soutien et de l'aide apportés. »

2. Goals of the study

Our general research goal addressed the learner-centered characteristic of the learning environment (especially the affective variables of pupils' writing), the knowledge-centered characteristic, understood here as being content written on the blog by pupils, and the community-centered characteristic, defined in the context of the blog as the possibility to obtain comments from people inside and outside of the classroom. We wanted to evaluate to what extent writing on a blog could have an impact on self-concept, motivation, and the relationship to writing. The following specific objectives were pursued:

1. To measure affective variables of students (self-concept, motivation, and relationship to writing).
2. To document blog use, in particular the amount and type of writing and interactions from the community's members.
3. To compare students' affective variables in the course of blog use.

3. Framework

To conceptualize the affective dimension of writing in this study, which is part of the student-centered characteristic of a learning environment, we used three variables: self-concept, motivation, and relationship to writing. Self-concept refers to esteem that an individual has for himself (Ross, 1973; Thomas, 1980). To document motivation, we used Deci and Ryan's (1985) theory of self-determination which states that self-actualization is influenced by three fundamental needs: competency, social belonging, and autonomy. This model conceptualizes motivation as being part of a continuum made up of six stages: intrinsic motivation, extrinsic motivation by integrated regulation, extrinsic motivation by identified

regulation, extrinsic motivation by introjected regulation, extrinsic motivation by external regulation, and amotivation (Vallerand, Fortier & Guay, 1997). The first type enumerated represents the highest level of motivation and the last is the weakest, or rather the total absence of motivation in an individual.

Relationship to writing is a well-known concept in the francophone academic world and refers to the way an individual positions himself towards writing as a social object and how this person uses this skill in his or her personal, cultural, and professional life (Barré-De Miniac, 2000). More specifically, this relationship is composed of feelings, emotions, passion, values, social representation and concrete actions which all have an effect on writing (Chartrand & Prince, 2009).

We analyzed blog posts' written content from the perspective of Rosenblatt's (1991) transactional model which supposes that the reader adopts a utilitarian or esthetic stance when reading a text. Table 1 shows indicators of each of these positions.

Table 1. Indicators for Each of the Stances in the Transactional Model (Rosenblatt, 1991)

Utilitarian Stance	Esthetic Stance
<ul style="list-style-type: none"> • Accent on information and factual descriptive content • Words have objective meaning • Vocabulary is neutral 	<ul style="list-style-type: none"> • Expression of emotion or sentiment • Reactive words • Recollection of attitudes, mental images, sentiment through the text • Vocabulary connotes, suggests • Strength, intensity are felt through the words used

4. Methods

4.1 Context of the study

We conducted our study in two elementary-school classrooms of sixth graders from the Province of Quebec (Canada), during the 2010-2011 academic year. Both teachers had the intent to expand their classroom's boundaries and to turn it into a networked learning environment. A blog was chosen to do so as it represented for them an easy way to give pupils authentic communication situations. In both classrooms, the blog used was designed by a group of pedagogical consultants experts in the use of ICTs for language acquisition (Service national du RÉCIT du domaine des langues). Tool's programming was based on SPIP² source code.

² <http://www.spip.net>

In the first classroom (Group 1), the teacher made the use of a blog mandatory, whereas in the other (Group 2) it was optional. There were 26 students in Group 1 (10 girls and 16 boys) and 28 pupils in Group 2, or 17 girls and 11 boys. Among the 28 pupils, 19 chose to write on the blog and yet of these, there were 13 girls and 6 boys.

Those who did not choose the blog had to write a personal journal. We have not analyzed content of this journal. In both classrooms, pupils had a choice of writing topics. In other words, personal journal and blog were used for free writing purpose. Pupils were encouraged by their teacher to catch readers' interest, although it wasn't made clear who were the potential readers, with the exception of the « whole world ». Each student had his or her own public blog, accessible via the school district website. All entries needed approval by the teacher before online publication. Both groups had access to computers in the classroom (Group 1 had 5 desktop computers and 1 laptop trolley that could be borrowed when requested; Group 2 had 16 desktop computers). Comments on blog posts could be made by internal and external participants but they also needed the teacher's approval, although it was impossible for him or her to change them. Pupils could write almost when they wished so as a lot of class time was devoted to individual work in both classrooms. They could also reached their blog from home although almost none did it, to our knowledge. Pupils had no quantitative constraint about blog or personal journal use. When writing a post on the blog, they were asked to choose a pre-defined category (writing intention) in order to identify whether the topic was related to passion, emotion (i.e. an esthetic stance) or reason (i.e. a utilitarian stance). This was the main different feature of the blog used, in comparison with the standard SPIP structure.

4.2 Data collection and analysis

The research team collected data throughout the 2010-2011 school year. Pupils completed pre- and post-tests about affective variables (written questionnaires filled out in the classroom) respectively in October 2010 and May 2011. We analyzed blog posts categorized in one or another of the two positions (esthetic or utilitarian), which corresponded to more than 95 % of all entries. Repeated measures analysis (using the general linear model) using SPSS 17® were computed for affective variables. Moreover, we correlated data between these factors and the number of posts written and comments received with the same software.

5. Results

Presentation of results is organized according to our three research objectives. We have highlighted results especially in cases in which differences were statistically significant.

5.1 Affective variables

5.1.1 Self-concept

Overall, students showed a rather positive self-concept and this was the case both at the beginning ($M=3.57$ on 5) and at the end of the academic year ($M=3.59$ on 5), whether they had used the blog or not. There was, however, no significant fluctuation between the pre- and post-tests, which indicates that self-concept remained unchanged for the group of students. This being said, girls showed a significantly higher level of self-concept than boys ($p=.035$) in the pre-test, but this difference is no longer significant in the post-test ($p=.211$). Furthermore, in Group 2 where utilization of the blog was optional, students who chose to use this tool showed a significantly higher self-concept at the pre-test level than those who did not ($p=.005$). Yet after the post-test, there was no longer any difference ($p=.158$).

5.1.2 Motivation

We will first present results concerning global motivation which constitutes the regrouping of all of the stages of motivation that we have measured in using our questionnaire. The students in Group 1, who all had to use the blog, experienced their motivation going up between the pre-test and the post-test ($F(1, 23)=5.243$, $p=.032$). We did not see such a difference in the students of Group 2 who used the blog. It is notable that there was no difference in global motivation in pre-test results whether the students used the blog or not. An explanation regarding the difference in results between Group 1 and Group 2 may lie in the particularly dynamic attitude that Group 1's teacher took on. For instance, he regularly made motivational speeches full of imagery about the relevance of expressing oneself on the blog.

As for the sub-scale of intrinsic motivation, this type went up between the pre-test and the post-test in Group 2 students who used the blog, but went down for those who did not choose this tool ($F(1, 24)=18.427$, $p<.001$). We believe that since the teacher's intervention was less about the public aspect of writing, this may have had some incidence on the development of a feeling of satisfaction toward writing on a personal level. We did not see this increase in Group 1 in which students all had the obligation to write on the blog.

Furthermore, regarding the whole group of participating students in the two classes, we found that the boys' intrinsic motivation was inferior to that of the girls' at both the pre-test and post-test level ($F(1, 46)=5.621, p=.022$). Motivation did not go down over the year however, contrary to a general tendency that Bouffard *et al.* (2005) have observed. Moreover, we noted no significant difference between the pre-test and the post-test in the extrinsic motivation categories of external and identified regulation.

5.1.3 Relationship to writing

We have drawn two main conclusions about the usefulness of writing from our analyses. Students who used the blog thought that their writing in this media helped them less to acquire knowledge as post-test results reveal, comparatively to what was believed when they were pre-tested. On the contrary, this perception increased in students who did not use the blog ($F(1, 45)=13.240, p=.001$). We submit two hypothetical explanations for these results. On one hand, could it be that the great latitude permitted and lack of systematic organization in blog use, which manifested itself by freestyle writing about essentially spontaneous opinions, has limited the challenge of the writing task and, in doing so, restricted the potential for student learning? Perhaps the increase in perception of non-blogging students could be attributable to the attention required when writing a journal destined for the teacher alone, which may necessitate that students get over a certain initial shyness in order to be able to tell their stories and, even, confide in someone else. There seems to be an important lesson to be learned in this case. Such explanations would also be akin to studies on motivation to learn who argue that the importance of tasks proposed to students must represent authentic challenges for them (Archambault & Chouinard, 2003).

On the other hand, the decrease in perception experienced on the part of the students who used the blog may also be attributable to the small number of comments received, as we will detail in section 5.2.3. Students may have noticed a discrepancy between the interaction potential that the teacher presented to them at the beginning of the year (which may have fueled strong initial expectations) and the reality of what actually happened (the expectations were more or less satisfied). Furthermore, to this effect, one of the teachers mentioned a few times during interviews that this was « selling a dream » to the students in the sense that, although he was highlighting the fact that the whole world could look at their texts, he remained fully aware that there would be few comments coming from outside of the classroom.

The post-test results then showed, more than those of the pre-test, that students who had not participated in the blog had more of an impression that it was writing that had helped them to retain what they had learned. This perception did not change in students who used the blog ($F(1, 45)=4.849, p=.033$). It is our opinion that this result concurs with the first tentative explanation that we gave in this section. Moreover, blog texts especially seemed to encourage an approach of knowledge telling (reciting what is already known and what comes up quickly to mind), in comparison with a more transformative approach which is based notably on the reorganization of ideas (Bereiter & Scardamalia, 1987).

5.2 Blog use

5.2.1 Amount of writing

From September to May, students in the two groups wrote 379 posts. The students in Group 1 wrote 131 texts, which constitutes an average of 5.24 posts per pupil ($SD=3.43$). Regarding Group 2 students, they authored 248 posts or an average of 13.05 per person ($SD=7.27$). Let us recall that not all students in Group 2 wrote on the blog since its use there was optional. Figure 1 illustrates the distribution of writing over the time period.

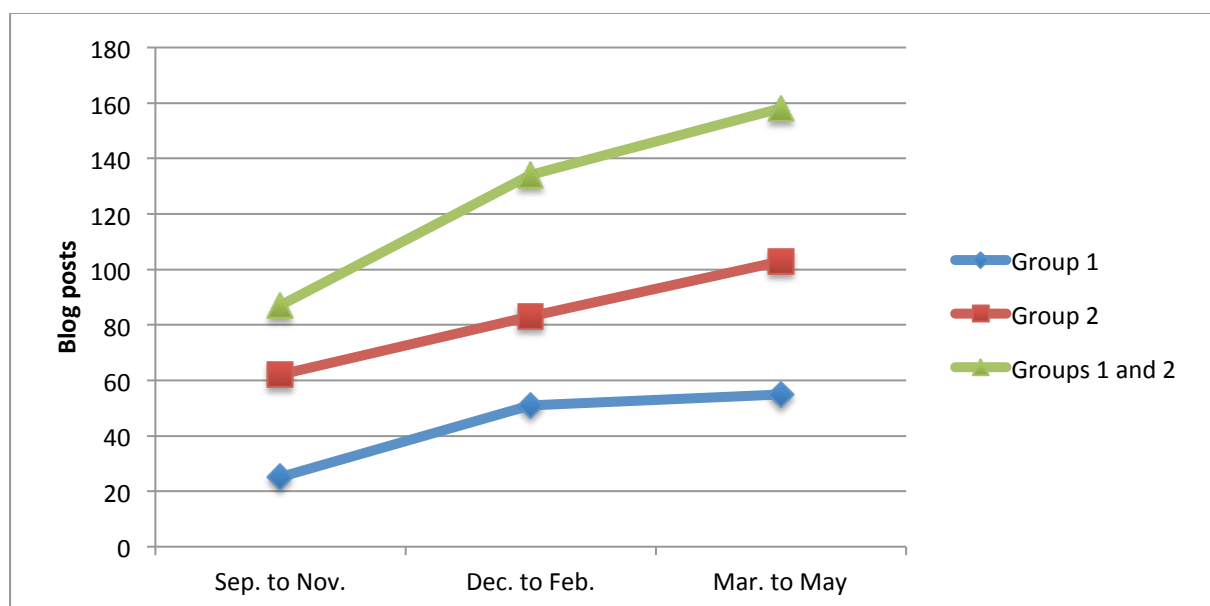


Figure 1. Number of Posts Written on the Blog throughout the School Year.

We did note an increase in writing intensity throughout the school year in both classes, especially in Group 2.

5.2.2 Type of writing

Figure 1 and Figure 2 illustrate the types of writing favored by students in the two groups.

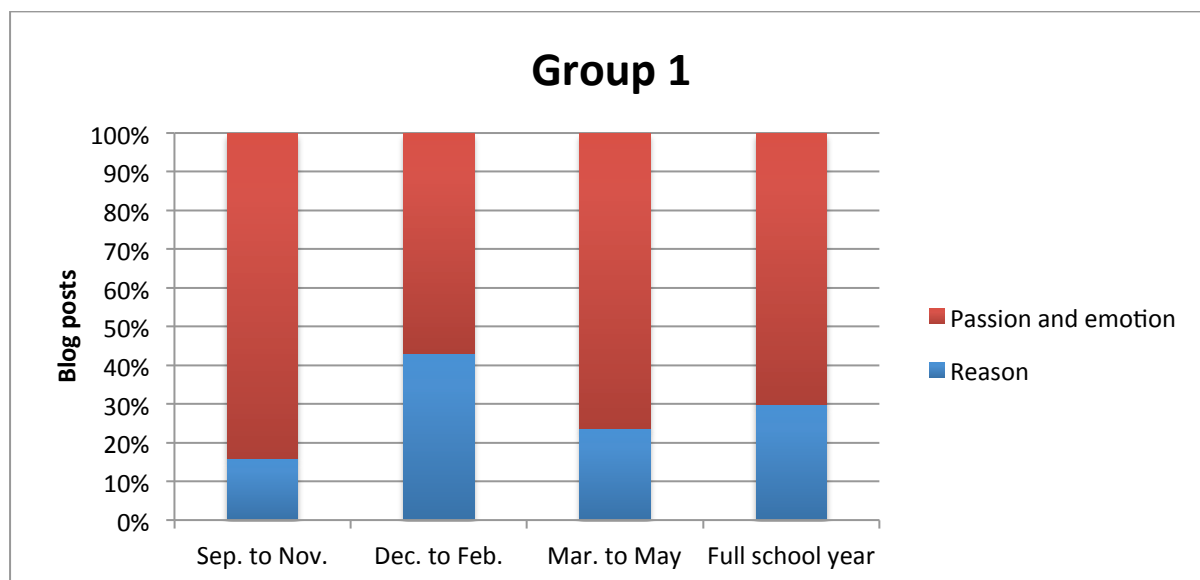


Figure 2. Choice of Writing Intent in Group 1 Students

The following examples come from different blog posts from group 1. It is translation from French.

- Passion and emotion stance

I like Twilight and as everybody can imagine, I like vampires. I find them charming, especially Edward. I really enjoyed the movie for its action. I know boys don't like very much this movie so my question is for girls: "who do you prefer: Jacob or Edward?" (Student G1-A)

Today, I will talk about my favourite hockey players [...].

1. Sydney Crosby: because I'm born in the same city and he does extraordinary passes.

2. Carey Price: because when he is in a great game, he is very good.

3. P.-K. Subban: because he always has lots of energy and a great shot.

[...] (Student G1-B)

- Reason stance

Today, I will talk about a gift I would like to have for my birthday. I'd like to have the iPod Touch 4th generation because with a router, we can have GPS access, we can use You Tube. Also, there is a camera and we can use Facetime [...]. Moreover, we can download many applications from the Internet, as "Tic Tac", "Blue Jump" and stuff like that. (Student G1-C)

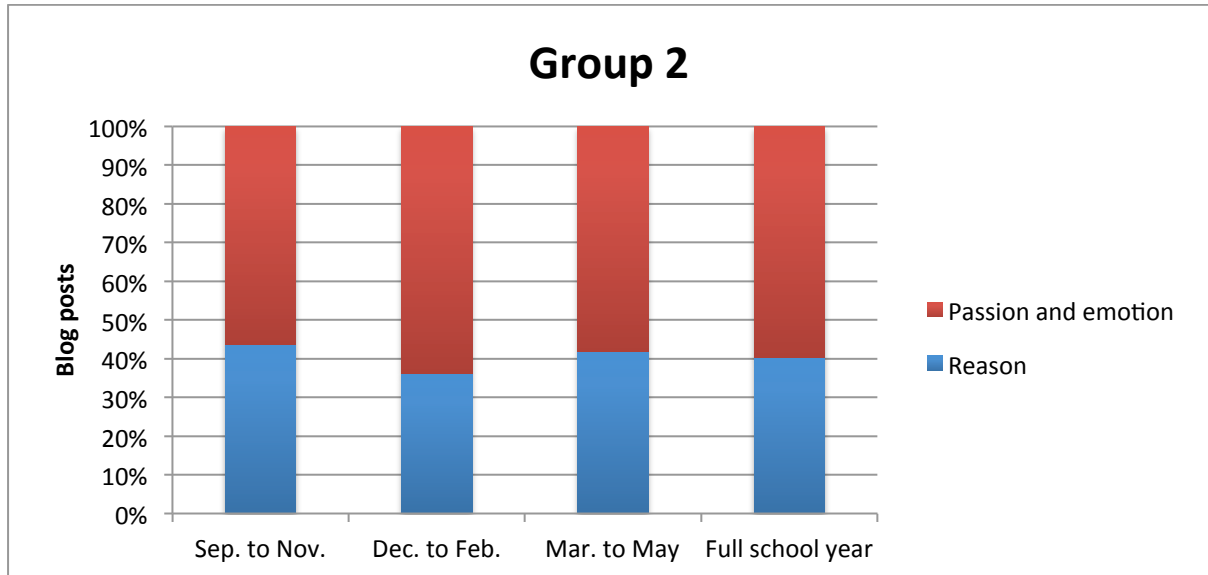


Figure 3. Choice of Writing Intent in Group 2 Students

The following examples come from different blog posts from group 2.

- Passion and emotion stance

[...] Dear readers, I'm going to talk about hockey. I can talk a lot about hockey. Recent trade (Halak for Eller and Boyd) is a bad trade for Montreal Canadians. Why? Because Halak is CH's savior and the two other players don't worth him. [...]
(Student G2-E)

- Reason stance

Middle Age period was not just. Only rich people could afford things. Poor people died from hunger and diseases such plague. But this period was heroic for knights. Middle Age period was time of war. Catapults and trebuchets were used. Also, people were much believers. [...] (Student G2-D)

Valentine's day is the day of love. Girls receive chocolate in a heart shaped box or flowers such as roses, tulips or daisies and boys receive love from their women. [...]
(Student G2-E)

Improvisation is amusing! It is an educational game. It develops imagination. You can play almost everywhere you want. You need at least four people. Six people is the maximum for a team. We often play improvisation in our classroom. It allows to know more about people with whom you play. (Student G2-F)

We remarked that the students in both groups had especially chosen to write with the intent of sharing emotions and passion, which is characteristic of an esthetic stance. However, the students in Group 2 tried to communicate in a greater proportion than those in Group 1 with the intention of reflecting on some questions, which is more in line with Rosenblatt's (1978) utilitarian stance. Predominance of esthetic writing such as the one of this study's context confirms cues of a knowledge telling approach.

This distinction between the two groups does not seem extraneous to some pedagogical intervention which could have contributed to bringing a specific "color" to each one of the documented contexts. From the interviews and observations conducted in class, we have noted that the teacher in Group 1 would bring his students to consider writing as an instrument permitting them to express what is important to them and what makes them react. To quote the teacher in question, he would tell pupils to "speak with their guts." The teacher in Group 2 would also encourage his pupils to explain and to justify in detail the content communicated on the blog.

Furthermore, we have remarked that the distribution of the types of writing chosen were similar throughout the academic year in Group 2. In Group 1, blog posts of the "Passion" or "Emotion" category were particularly popular in the first third of the year (84% of posts written). The way that the teacher presented the blog to students also seems to have a bearing here. It was clear that he wanted to convince students by his words, but also his particularly enthusiastic non-verbal language, that the blog is a means to express to others who one is and what one is about. We might say that he himself showed much passion, comparatively to the teacher in Group 2 whose intervention on the meaning of the blog was more neutral and calm.

Figure 4 shows favourite writing topics of pupils.

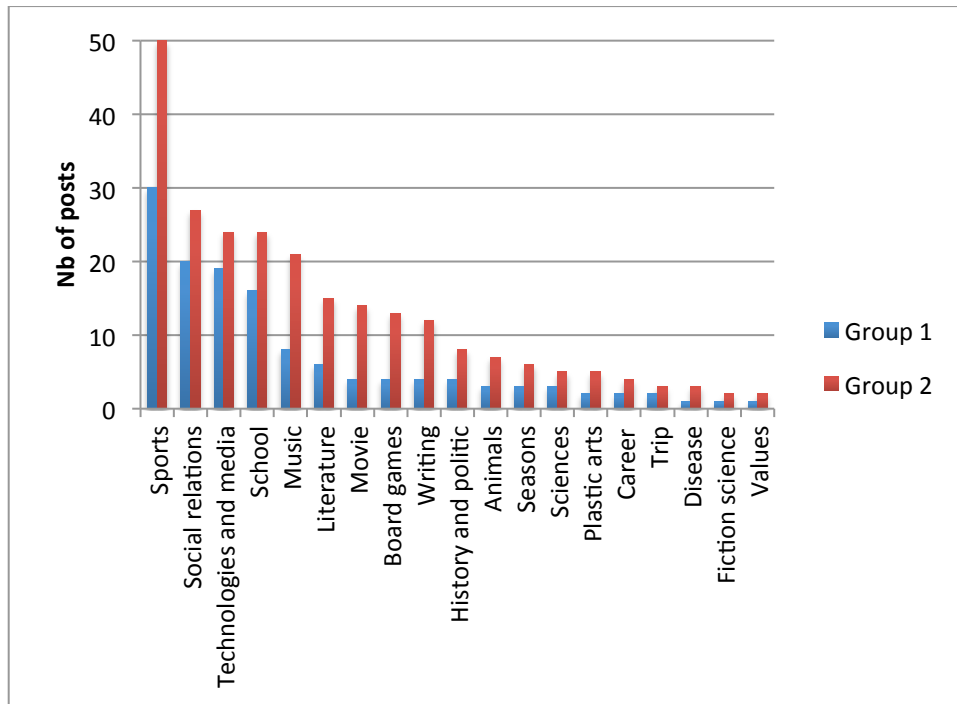


Figure 4. Topics of writing

We can remark pupils of both groups preferred to write about four main topics: sports, social relations, technologies and media, and school.

5.2.3 Interactions with the community's people

Figure 3 is illustrative of the comments received on the blog in both groups.

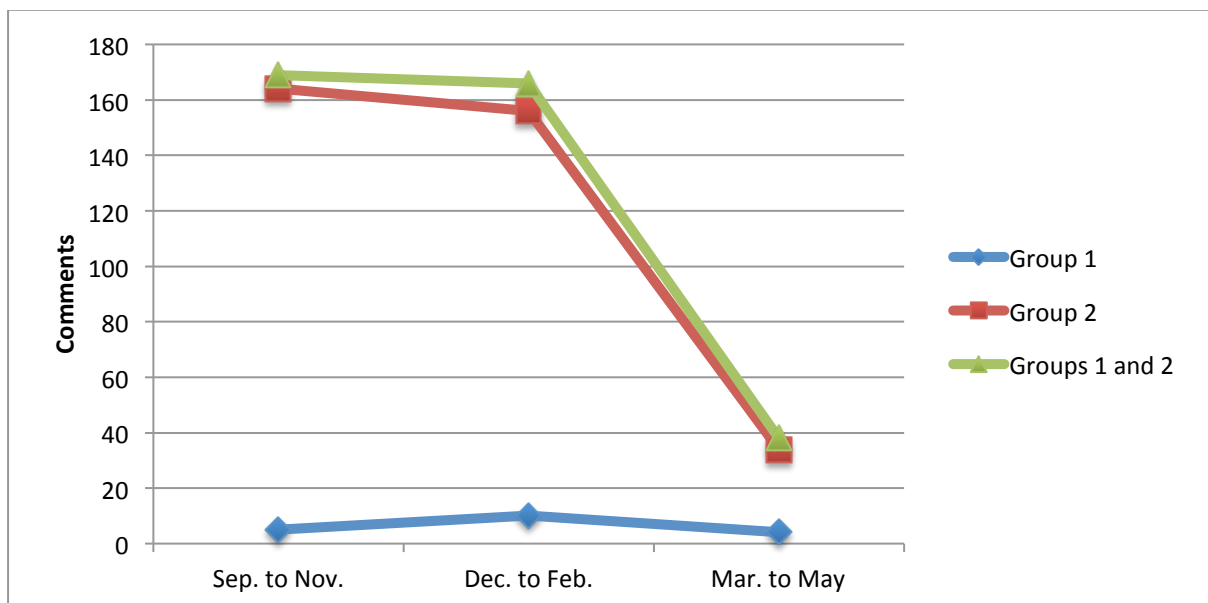


Figure 5. Comments received

We have noted that there were few comments on Class 1's blogs, whereas we saw the opposite in Group 2, particularly in the period extending from September to February. The

fact that the teacher in Group 1 only discovered at the end of the academic year how to put posts online explains this situation; thus, comments were pending for publication. Also, even though about half of the comments in Group 2 came from the research team, the other half originated from classmates, a few parents, and exceptionally, an outside reader.

Posts generating many comments were rare. On the technical front, we must mention that to be made aware of the presence of a new comment on the blog that participating classes used, one had to go back inside the individual written post. This procedure certainly complicated the consultation of comments and could explain, at least in part, the small average number of these per post.

Figure 4 illustrates the nature of the comments that the pupils wrote on their blogs in Group 2. We concentrated on this class rather than both groups because of the small number of comments on Group 1's blogs.

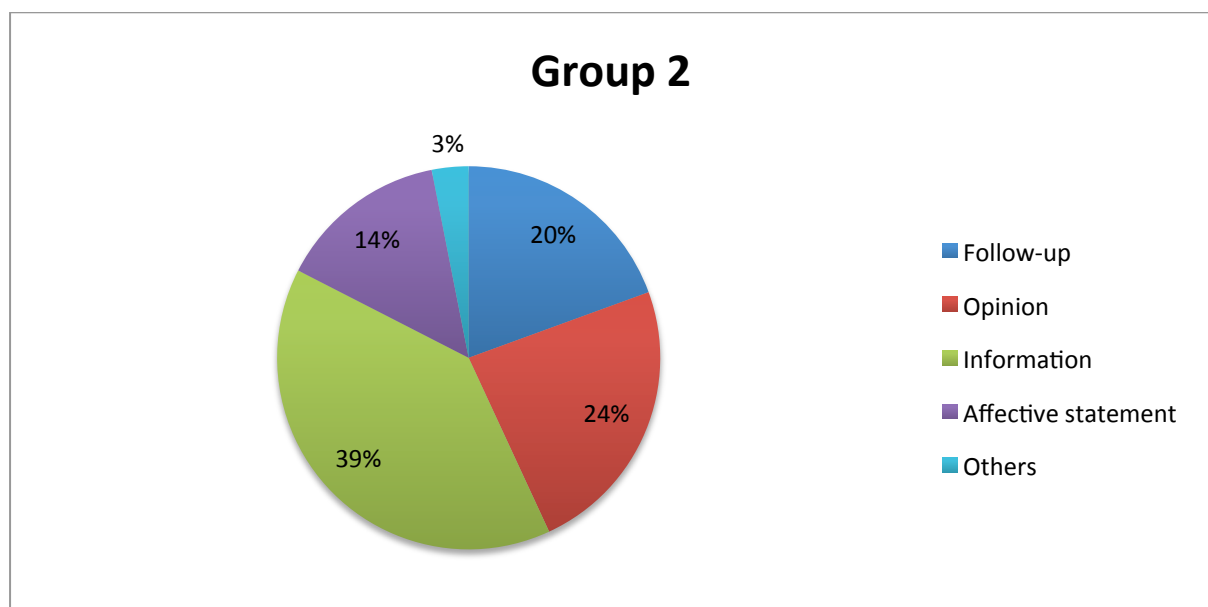


Figure 6. Types of Comments Made

Four main types of comments emerged from the analysis that we conducted. These were of a follow-up nature (20%), formulated especially around questions and seeking to obtain more detailed information from the post's author or the author of a comment. Opinions (24%) shared a personal point of view, whereas informative comments (39%) gave out more facts on a subject. Finally, comments of an affective or emotional nature mainly encouraged authors to continue their work or congratulate them on work done. Here are a few examples of each type:

Follow-up

"That's not what I what I wanted to say, but do you think that it's a good thing in your schooling to participate in war games?"

Opinion

"I agree with you. I think it's more the Chinese who do that. The Chinese kill whales, tigers, cats, etc. I don't like that. I would like for it to stop all of this animal killing."

Information

"I think you are absolutely right but if a robot is reduced to artificial life it couldn't be as intelligent as man but in Isaac's book the robot doesn't have any emotions."

Affective statement

"[...] When you were little, you adored it when I read stories to you; we had hours upon hours of fun. Then, you began to read and this passion ensued. Now, I no longer read you stories, but our great moments spent side to side each reading our books are very precious to me!"³

5.3 Relations between affective variables and blog use

When we linked the number of posts written to the overall motivation to write, we noticed a positive correlation in both the pre-test ($r=.367$, $p<.05$) and the post-test ($r=.463$, $p<.05$). It appears that the students who enjoyed writing the most at the beginning of the year were those who wrote the most posts and who still appreciated writing the most at the end of the year.

Positive correlations emerged between the number of posts written and the pretest's ($r=.320$, $p<.05$) and post-test's ($r=.490$, $p<.01$) results in the sub-scale of intrinsic motivation related to writing, as well as those of the pre-test ($r=.395$, $p<.01$) and the post-test ($r=.566$, $p<.01$) concerning self-concept related to writing. Furthermore, a negative correlation was observed between the number of posts written and the post-test results for the sub-scale of extrinsic motivation by external regulation ($r=-.331$, $p<.01$). This suggests that students who wrote more often became more aware of the importance of not writing to answer to external demands. This can be seen as positive.

Moreover, the research team proceeded with correlational statistic analyses from data on comments. On the whole, we noted positive links between comments received and the affective aspect of writing. More specifically, comments that readers made to bloggers of an informational nature ($r=.464$, $p<.05$) had a positive relation to self-concept in the post-test. There also is a positive connection between comments that the pupils received to intrinsic motivation at the post-test level ($r=.473$, $p<.05$). We made yet another positive conclusion connecting extrinsic motivation by external regulation. The post-test results linked it in a

³ This comment was written by a parent to his child.

negative manner to written comments ($r=.525$, $p<.05$). These two last conclusions are somewhat surprising as they tend to suggest external influences (i.e. blog comments) could reinforce autodetermination.

Such results, although they are not causal, suggest that writing or receiving comments about blog posts may contribute to motivation and self-concept in students. However, considering that Group 1 students received few of these, but still showed high motivation, we feel that we must remain prudent on the question of the importance attributed to comments.

Discussion

The results presented in this study highlight a certain number of elements that contribute to enriching the understanding of the affective aspect of learning in the context of writing supported through blog use while in school. In the first place, results suggest that the choice to write or not with a blog may be linked to self-concept before the fact of the actual writing with this media. It is possible that the public aspect of the blog could contribute to this conclusion. Thus, some students may perceive it as being intimidating. In this regards, teachers who plan to use a blog with their pupils should carefully reassure kids before they start writing with this media. This is mostly important with kids who may lack confidence in their writing. It appears large audience could intimidate them as they don't exactly know what to expect from readers.

Secondly, results of this study lead us to put into perspective a conclusion made through an inventory of the writing of Authors (2010) about blog use which said that it could have a negative effect on motivation to write. The results of the current study lead us to qualify this statement. Obliging students to write on a blog does not seem to have a negative effect on their overall motivation. In fact, students in Group 1 whom the teacher had required the use of this tool had an increase in motivation. As implication for teachers, it seems it is more important to let the student have a choice on the subject that he or she will write about. Moreover, giving students the choice to blog or not seems to specifically have an effect on intrinsic motivation.

Next, there seems to be a Matthew Effect in blog use. Such effect refers to the phenomenon we can generally state as follow: by ways of doing things, the rich get richer and the poor get poorer. In the context we studied, pupils who are most motivated to write are those who tend to choose writing on a blog, e.g., experience new ways to write. Moreover, they are also those who remain the most motivated at the end of the academic year in this respect. From an intervention perspective, this raises important questions about how to get

students involved who are less naturally inclined towards writing. Boys' intrinsic motivation is inferior to girls' in both pre-tests and post-tests. It does not, however, diminish contrary to what usually happens. This might illustrate in some way the potential of writing activities supported by ICTs and especially those that offer students the possibility of making certain choices as they write.

Another aspect of our discussion concerns freestyle writing. Caution may be warranted on this subject. For instance, does it lead students to surpass themselves in terms of what they are able to do? The results of the pupils' relationship to writing in students who used the blog are questioning in this sense, as they had less the impression than their classmates who used a personal journal that the act of writing permitted them to appropriate new knowledge and remember what they had written. More than a question of motivation, it is the school's role that we summon here. This being said, we do see the increase in writing throughout the school year as a positive element. Indeed, the blog is a tool whose potential, in terms of scholastic commitment, does not seem to fleet. We perceive it as an interesting starting point from which to work more complex and advanced forms of writing with pupils. Complementarily to this, the fact that teachers' intervention seemed to have oriented pupils' writing provides an additional argument in favour of having them experience more transformative writing practices. For teachers, this calls the important question of explicit intervention about such writing practices. Indeed, ICTs are not sufficient in themselves to scaffold such advanced practices (Hattie, 2009). Specific support from teacher about specific textual elements is also required.

In the end, even though technically there is massive digital broadcasting potential in blog posts, we must conclude that this potential is not easily materialized. This notably begs the question of the relevance of what students write on school blogs in the eyes of the outside reader. The effect of an external readership on student motivation is far from being as obvious as certain authors would suggest. As pedagogical implication, this raises the question of the writing intent and the audience to whom pupils write. Well-known bloggers usually target a specific audience about few particular topics, instead of trying to write to the « whole world » and about « anything ». We think teachers should reflect about it with pupils.

In conclusion, even though this research has been conducted with rigor, we would like to point out some of its limitations. The first one pertains to our groups of subjects which is not representative. Thus, we cannot generalize results about the groups which participated in the study. However, this has allowed us to consider some specific aspects of the contexts inasmuch as they explain certain quantitative results. The second limitation applies to results

that specifically originate from correlations made through the course of our analysis. One should interpret them with great care. In this sense, we consider our study as a step for others who could try to identify clearer effects at some future point. That being said, this fact does not diminish, in our opinion, the strength and element of originality our research has shown about the study of affective variables shown in blog writing throughout the school year.

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