Vocabulary use and other factors of proficient readers and writers in the Remote Networked School initiative

Stéphane Allaire
Vincent Gagnon
Université du Québec à Chicoutimi

Introduction

Discourse being an important part of the knowledge creation process, pupils involved in it not only have the opportunity to progressively get acquainted with the knowledge building principles; they also use and refine their reading and writing skills (Scardamalia, 2003) – including vocabulary – as they work in collaboration to understand authentic problems from sciences, social studies and other domains.

Our study builds on previous research work in the context of the Remote Networked School (RNS) initiative about basic vocabulary measurements (Allaire, 2007; Allaire & Gagné, 2008). RNS is a Ministry of Education initiative that aims to diversify social interactions for learning and knowledge building purposes in rural schools of the Province of Quebec by using collaborative ICTs, of which Knowledge Forum (KF).

Statement of the problem

There is a consensus in literacy that vocabulary knowledge and text comprehension are inextricably linked (Wood, 2001). Indeed, studies state that depth and breadth of vocabulary are important factors of an efficient capacity to understand various texts (Anderson & Freebody, 1981; Coady, 1993; Stoller & Grabe, 1993; Thorndike, 1973). Reading frequency is also often stressed as an important factor. In regards of writing, a large body of researches (MacArthur, 2006; Graham & Harris, 2005; Faigley, Cherry, Jolliffe, & Skinner, 1985) show proficient writers are those who invest in developing ideas based on specific goals, e.g. advancing their comprehension of authentic problems. They also do clear word choice, self-regulate their writing process and revise their ideas. KF affordances support such skills.

We investigated relations between vocabulary use and other indicators of proficient readers and writers in regards of the frequency of reading and writing contexts that pupils took part on KF. Our main research question was the following : Which are the differences in the presence of such indicators depending on the number of reading and writing contexts? Our hypothesis was that indicator measurements of proficient readers and writers would be more present where there would be more reading and writing contexts.

Methods

Participants

Participants were elementary level classrooms from four school boards (SB A, E, F, M) that are partners in the fourth phase (2008-2010) of the RNS initiative. These SB were chosen as they are the ones implicated in the research part of this phase. Classrooms used KF based on teachers' pedagogical intentions and local context. Inquiry and authentic problems were key aspects of their network practice. All SB had access to just-in time support (Hamel, Allaire & Turcotte, 2009) provided by a research-intervention team. As a whole, 47 classrooms were considered in our study. This represented 693 contributors, a contributor being someone who wrote at least one note on KF during the data collection period. We collected data for each one of these contributors.

Data collection

Data were gathered throughout the 2008-2009 school year using the Analytic ToolKit (ATK) and analysis applets (Contribution, Social Network Analysis and Lexical Analysis) included in KF. An important assumption of this study being about the importance of frequent reading and writing contexts, we thus used the number of inquiry activities (number of views created) and the number of written notes as indicator measurements of it. As a whole, 324 views were developped and our analyses included 9070 written notes.

Regarding proficient reader and writer factors, we suggest the following basic indicator measurements to represent them.

Proficient reader factors	ATK / applets indicator measurements
Reading frequency	- Reading rate - Length of inquiry activities
Reading diversity	- Density read - Network edges read
Proficient writer factors	**ATK / applets indicator measurements**
Developing ideas	- Word count per note - Written words - Build-on rate - Density build-on - Network edges build-on
Self-regulation	- Scaffolds use - Coherent use of scaffolds
Revision of ideas	- Number of revisions
Clear word choice	- Different words use - Keywords use rate

Indicator measurements were gathered for each pupil or view and were formatted for Excel and SPSS in prevision of analyses.

Data analysis

We did SB and classrooms comparisons. We used descriptive statistics (Excel 2008) and analyses of variance with post hoc tests when needed (Games-Howell) (SPSS 16). A significance level of .01 was used for all ANOVAs. Content analysis was also conducted to determine coherent use of scaffolds (Allaire, 2006; Turcotte, 2008).

Results

The following table shows descriptive statistics for each SB of the current study. Time period is school year 2008-2009.

School boards	Classrooms	Views	Written notes	Contributors	Developing ideas		Self-regulation		Revision of ideas	Clear word choice	
					Build-on rate	Word count per note	Scaffolds use	Coherent use of scaffolds	Revisions	Different words use	Keywords use rate
A	17	97	1671	203	0.76	22.83	1170	0.52	289	101.02	0.00
E	9	23	762	101	0.99	31.00	456	0.63	162	126.34	0.00
F	8	174	5081	160	0.92	26.12	3794	0.68	3231	344.86	0.11
M	13	30	1556	229	0.98	27.91	915	0.75	228	101.93	0.02

We can note students from SB F were implicated in a greater number of reading and writing contexts on KF than other SB, with a total number of 174 developed views and 5081 written notes. This difference is significant for both, number of views (p=.000) and written notes (p=.000). However, there is no significant difference between SB A, E and M for the number of developed views and written notes.

Analyses of variance – School boards

Descriptive statistics brought us to do comparisons from suggested proficient reader and writer indicator measurements between SB F and the three others. Results are presented in the next table.

	Other school boards			ATK / applets indicator measurements	Proficient reader/writer factors
	A	**E**	**M**		
School board F	p=.532	.000 (-)	.985	Reading rate	Reading frequency
	.002*	1.000	.316	Length of inquiry activities	
	.000*	.043 (-)	.659	Density read	Reading diversity
	.000*	.000*	.956	Network edges read	
	.052	.040*	.664	Word count per note	Developing ideas
	.000*	.000*	.000*	Written words	
	.000*	.000* (-)	.000* (-)	Build-on rate	
	1.000	1.000	.332	Density build-on	
	.000*	.000*	.579	Network edges build-on	
	.000*	.000*	.000*	Scaffolds use	Self-regulation
	.000*	.543	.139	Coherent use of scaffolds	
	.000*	.000*	.000*	Number of revisions	Revision of ideas
	.000*	.000*	.000*	Different words use	Clear word choice
	.000*	.000*	.000*	Keywords use rate	

* means that the results of the SB F are significantly different (positively) of the results of other SB.
(-) means that the results of other SB are significantly different (positively) of the results of the SB F.

Analyses of variance – Classrooms

Among the 47 classrooms of the study, 2 (classrooms 5 and 8) participated in more reading and writing contexts using KF than all other classrooms. That was significantly different for developped views (p=.000) and for written notes (p=.000). However, no difference was found between classrooms 5 and 8 (p=1.000; p=.938). These results brought us to do comparisons from suggested proficient reader and writer indicator measurements between these two classrooms (who shared a similar reading and writing context on KF) and other classrooms. Results are presented in the following table.

	Other classrooms	ATK / applets indicator measurements	Proficient reader/writer factors
Classrooms 5 and 8	p=.000*	Reading rate	Reading frequency
	.055	Length of inquiry activities	
	.003*	Density read	Reading diversity
	.000*	Network edges read	
	.410	Word count per note	Developing ideas
	.000*	Written words	
	.642	Build-on rate	
	1.000	Density build-on	
	.000*	Network edges build-on	
	.000*	Scaffolds use	Self-regulation
	.085	Coherent use of scaffolds	
	.000*	Number of revisions	Revision of ideas
	.000*	Different words use	Clear word choice
	.000*	Keywords use rate	

* means that the results of classrooms 5 and 8 are significantly different (positively) of the results of other SB.

Discussion

The frequency of reading and writing contexts offered to students on KF seemed to impact positively the following factors of proficient readers and writers :

- Self-regulation
- Revision if ideas
- Clear word choice

Regarding this last factor, results about different words use tend to confirm last years correlations (Allaire, 2007; Allaire & Gagné, 2008): the more students write, the more their vocabulary diversifies.

Less differences for the factor "developing ideas" could be explained by the fact that indicator measurements correspond to basic principles and affordances of knowledge building and KF, who are well-known by SB; all of them being in RNS since 5 years.

Although significant differences were noticed in build-on rate, we have to keep in mind this rate remains high for all SB (>75%)

Our results about coherent use of scaffolds confirm Turcotte's findings (2008) who observed this use doesn't improve necessarily with KF experience.

Limits, considerations and next steps

- For some reasons, we were not able to considere all written notes for the time period covered by our study. We estimate our sample (9070 notes) represented 85% of all written notes by the four SB for the 2008-2009 school year.
- No inter-rater reliability test was conducted to determine coherent use of scaffolds (only intra-rater reliability test). Also, when a note with scaffold was coauthored, its coherence status was coded only for the first author of the note.
- We expect to cross our results with reading comprehension test results (PIRLS pre-test and post-test for school year 2008-2009).
- To refine suggested indicator measurements with more qualitative aspects of what's going on KF.

References

Anderson, R. C., & Freebody, P. (1981). Vocabulary knowledge. In J. T. Guthrie (Ed.), *Comprehension and teaching: Research perspectives* (pp. 71-117). Newark, DE: International Reading Association.

Coady, J. (1993). Research on ESL/EFL vocabulary acquisition: Putting it in context. In T. Faigley, L., Cherry, R. D., Jolliffe, D. A., Skinner, A. M. (1985). *Assessing writer's knowledge and processes of composing*. Norwood, New Jersey: Ablex Publishing Corporation.

Graham, S., & Harris, K. (2005). Improving the writing performance or Young struggling writers. *The Journal of Special Education, 39*(1), 19-33.

Hamel, C., Allaire, S., & Turcotte, S. (2009). Just-in time on-line support to enhance teachers' professional development in an innovative context. *European Association for Research on Learning and Instruction (EARLI)*, Amsterdam.

Huckin, M. Haynes, & J. Coady (Eds.), *Second language reading and vocabulary learning* (pp. 3-23). Norwood, NJ: Ablex Publishing.

MacArthur, C. A. (2006). The effects of new technologies on writing and writing processes. In C. A. MacArthur, S. Graham, & J. Fitzgerald (Eds.), *Handbook of writing research* (pp. 248-262). New York : Guilford.

Stoller, F. L., & Grabe, W. (1993). Implications for L2 vocabulary acquisition and instruction from L1 vocabulary research. In T. Huckin, M. Haynes, & J. Coady (Eds.), *Second language reading and vocabulary learning* (pp. 24-45). Norwood, NJ: Ablex Publishing.

Thorndike, R. (1973). Reading as reasoning. *Reading Research Quarterly, 9,* 135-147.

Turcotte, S. (2008). *Computer-supported collaborative inquiry in Remote Networked Schools*. Thèse de doctorat, Université McGill.

Wood, J. (2001). Can software support children's vocabulary development ? *Language Learning & Technology, 5*(1), 166-201.