DEVELOPING A COLLABORATIVE USE OF THE INTERACTIVE WHITEBOARD BY K-2 STUDENTS: AN ACTION RESEARCH

Carole Raby, professor, University of Quebec in Montreal, Quebec, Canada
Annie Charron, professor, University of Quebec in Montreal, Quebec, Canada
Martine Peters, professor, University of Quebec in Outaouais, Quebec, Canada

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Research Context
Massive arrival of interactive whiteboards

1996
Equip Quebec schools with computers and peripherals (318 millions $ over 5 years)

2011
Provide each classroom with an IWB (40 000 IWB, 240 millions $, over 5 years)

2014
The number of IWB is growing in the elementary schools of Quebec
Using the IWB in the classroom

- Teachers have a tendency to:
  - Integrate the IWB into their existing practices (Cogill, 2002);
  - Use the IWB when teaching as a whole class (Winzenried, Dalgarno and Tinkler, 2010);
  - Keep control of the IWB (Winzenried, Dalgarno and Tinkler, 2010);
  - Call the students one by one to punctually have them interact with the IWB (Bennett and Lockyer, 2008)
“Traditional” use of the IWB

- Especially when teachers:
  - start using it;
  - never had training.

(Hodge and Anderson, 2007; quoted in Winzenried, Dalgarno and Tinkler, 2010)
Caution

- The IWB, when placed in front of the class, could even reinforce a traditional teaching style.

(Hall and Higgins, 2005; quoted in Gillen, Staarman, Littleton, Mercer and Twiner, 2007)
What are the advantages of using the IWB when teaching?

- **Create and present attractive resources** (Ball, 2003; Kennewell, 2004);

- **Can accelerate the rhythm** (Glover and Miller, 2001b; Ball, 2003; Miller, 2003) and facilitate the synthesis of the lessons (Glover and Miller, 2002; Walker, 2002);

- **Facilitate the incorporation of diverse multimedia resources** (Ekhami, 2002; Johnson, 2002; Levy, 2002)
  - Texts, photos, videos, sounds, diagrams, websites, etc.

Quoted in Higgins, Beauchamp and Miller (2007) and Duroisin and al. (2011)
The learning benefits of the IWB are largely dependent of the way it is used in the classroom.

(Winzenried, Dalgarno and Tinkler, 2010)
Teachers need training and support to use the IWB to its full potential and to facilitate students’ learning.
Objectives
Objectives of the project

1) To develop and put in place a continuous training model based on a professional learning community (PLC) composed of kindergarten and first cycle teachers, educational consultants, and researchers, in an action research process;

2) Experiment, document and analyse techno-educational practices that foster the collaborative use of the IWB by the students, for their learning in languages and other domains;

3) Study the impact of the collaborative use of the IWB by the students on their engagement and their learning in languages.
Frame of reference
Impacts of the collaborative use of the IWB in the classroom

- Generate and maintain a dialogic space (Warwick, Kershner and Staarman, 2010)
- Allow the confrontation and the co-construction of ideas (Mercer, 2000; quoted in Mercer, Warwick, Kershner and Staarman, 2010)
- Make visible the reflexion process (Kershner and al., 2010) and strategies used by peers (Haldane, 2007)
Conditions needed to “think and build together” with the IWB

- Enough time;
- Complex task;
- Scaffolding strategies from teachers and peers;
- Availability of resources and tools;
- Social abilities to work together/“talk-rules” (turn taking on the IWB & in discussion, not to interrupt, etc.).

(Mercer, Warwick, Kershner, Staarman, 2010)
TECHNOLOGICAL, PEDAGOGICAL AND CONTENT KNOWLEDGE (TPACK)

Efficient use of ICT

Technological knowledge

Educational knowledge

Content-related knowledge

The teacher uses the IWB to write and draw as if it was a blackboard.

The teacher uses activities that he/she prepared in basic subjects and in a linear manner.

The students write, encircle, highlight and ‘drag’ content.

The teacher uses many functions and programs at the same time.

The students use different tools available in the IWB software.

The teacher uses hyperlinks, different types of files (pictures, sounds, videos) and peripherals.

The students frequently and confidently use the IWB, often in a spontaneous manner.

The teacher and the students use the IWB to its full potential and in an equal manner to co-construct knowledge and learning.

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(Beauchamp, 2004)
Action Research

« A methodological practice centered on the resolution of a concrete problem experienced in a real educational situation with the goal to make beneficial changes, to contribute to the professional development of those who took part in it and to improve the knowledge on this situation. »

(Guay and Prud’homme, 2011, p.188)

The three goals of the action research (Dolbec and Clément, 2004)
Professional Learning Community on the IWB

- 5 dyads
  - K-2 Teachers
- 4 pedagogical consultants
- 3 researchers
## Methodology / Data collecting

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Results
Year 1 and year 2 preliminary results

- How do teachers’ educational practices develop regarding the student’s collaborative use of the IWB?
Technological knowledge

Educational knowledge

Content-related knowledge

Notebook
Basic functions
Tools (vortex, dices, alphabetical lists, etc.)

YEAR 1

“Traditional” Teaching
(punctual activities, closed questions and unique answers)

Progressive Preoccupation: Brain, Desk, Board, Network

Essential knowledge

(Mishra, P. & Koehler, M. J., 2006)
YEAR 2

Technological knowledge

Educational knowledge

Content-related knowledge

Cooperative learning
Center approach

Open canvas and more software and tools

Disciplinary competencies

(Mishra, P. & Koehler, M. J., 2006)
Maximal use of the IWB and all of its functions: pictures, sounds, hyperlinks, etc. Use of peripherals.

Disciplinary and cross-curricular competencies

Essential knowledge

(Mishra, P. & Koehler, M. J., 2006)
Progression of interactions with the IWB

(Birmingham and al., 2002; quoted in Higgins, Beauchamp and Miller, 2007)

(graphics: André Roux)
The teacher and the students use the IWB to its full potential and in an equal manner to co-construct knowledge and learning.

- The teacher uses hyperlinks, different types of files (pictures, sounds, videos) and peripheral.
- The students frequently and confidently use the IWB, often in a spontaneous manner.
- The teacher uses many functions and programs at the same time.
- The students use different tools available in the IWB software.
- The teacher uses activities that he/she prepared in basic subjects and in a linear manner.
- The students write, encircle, highlight and ‘drag’ contents.
- The teacher uses the IWB to write and draw as if it was a blackboard.

(Beauchamp, 2004)
Year 1 and year 2 preliminary results

What is the impact of the use of the IWB on the students’ learning?

What were the students’ learning when using the IWB, as noted by the teachers and reported by the students themselves?
Students’ learning

- Disciplinary competencies
  - Learning of vocabulary
    - “I think that for anagrams, it helps the children to memorize vocabulary words. I saw, even in spelling quizzes, improvements since we started to play that game in class. It is an activity that we do on a regular basis during the week…” [Grade 1 teacher]
Students’ learning

- Disciplinary competencies
  - Reading
    - “(...) I noted a great improvement in reading in the majority of my students, even in those that were in difficulty” [Grade 1 teacher]
    - Reading strategies [reported by students themselves]
      - Using of the first letter of the word
      - Decoding
      - Global recognition of the word
Students’ learning

- Disciplinary competencies
  - Writing
    - Handwriting
    - Writing words and sentences
    - Spatial organization
    - Story structure
      - “Inventing stories made my students work on structure and ideas to build stories” [Kindergarten teacher]
Students’ learning

- **In summary,**
  - “They [students] discuss, exchange, have to make compromises, give ideas, find solutions, ask for help… (oral)
  - There are activities [with the IWB] to develop reading: word finding, word/picture associations, message of the day, wordplays, (...) phonological awareness,
  - and also in writing (invented spelling, handwriting).
  - There is also when I [teacher] type at the keyboard (…), my students see the words that I say written in front of them.

It is a very interesting tool for language development.”

[Kindergarten teacher]
Students’ learning

“Cross-curricular” Competencies

- ICT Competency (8/10)
  - Notebook Tools
    - “The students have more autonomy using certain tools like pencils, highlighters, colors…” [Grade 1 teacher]

- Autonomy (8/10)
  - “During a complex task with constraints and working in teams, I see that students try things, functions, discuss with each other and find solutions to smaller challenges and ask for help for greater ones.” [Kindergarten teacher]

- Fine Motor & Gross Motor Learning (5/10)
Even though studies show advantages to the use of the IWB in class, its impact on the students’ learning remain to be clearly demonstrated.
Conclusion

- Teachers need:
  - training and
  - long-term support (TPACK)

So that the IWB really becomes a tool for:
- the co-construction of knowledge and competency development of the students
Contact

Carole Raby  
Professor  
Researcher at the CRIFPE Department of didactics  
University of Quebec in Montreal, Quebec, Canada  
raby.carole@uqam.ca

Twitter: carole_raby

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