

REDUCE INEQUALITIES IN WRITING USING SPEECH SYNTHESIS (TTS) AND COMBINED TECHNOLOGIES

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INTRODUCTION & RESEARCH QUESTION

The aim of the contribution is to present a tool dedicated to primary school students (aged 7 or 8 years) and using speech synthesis. It should help students :

- master grapho-phonological conversion,
- strengthen their writing skills under dictation
- Improve their ability to segment in orthographical words.

Speech synthesis provides an audio feedback that could help students proof-read their texts. Since they usually lack the skills to revise a text at this age, it can reduce inequalities in the use of writing.

Specific question:

What are the contributions and limitations of voice synthesis to reduce inequalities in reading and writing skills?

Theoretical Framework

Mastering the phonem and graphem code is necessary but not enough to enter the written world (Maisonneuve, 2002). So it may be relevant for 1st and 2nd graders to keep a bond between what is about to be written and oral aspects. Nowadays few supports provide proofreading so that pupils can hear differences between what they intended to write and what they really wrote. TTS is interesting when it is used simultaneously with what is being written for feeding phonetic, spelling and syntactic doubt (Marty, 2005). TTS potentialities are often underused (Handley, 2009, Gelan, 2011).

Research perspectives

Effects of the speech synthesis on learning (Cohen, 1992; Lété, 2008)

Proposal of appropriate individual course (differentiation)

Hypotheses

H1: Development of reflexivity (phonetic, spelling or even syntactic doubt, Martin, 2005), of analysis and research of language errors (Cohen & Egle, 1992) and of metacognitive skills (Lété, 2008).

H2: Acquisition of language and typographic skills, especially through the development of physical, cognitive and linguistic autonomy (Mangenot, 1996).

Material and methods: 2 experimental phases

Phase 1

→ Platform ergonomics, 2 different voices, 3 types of exercices

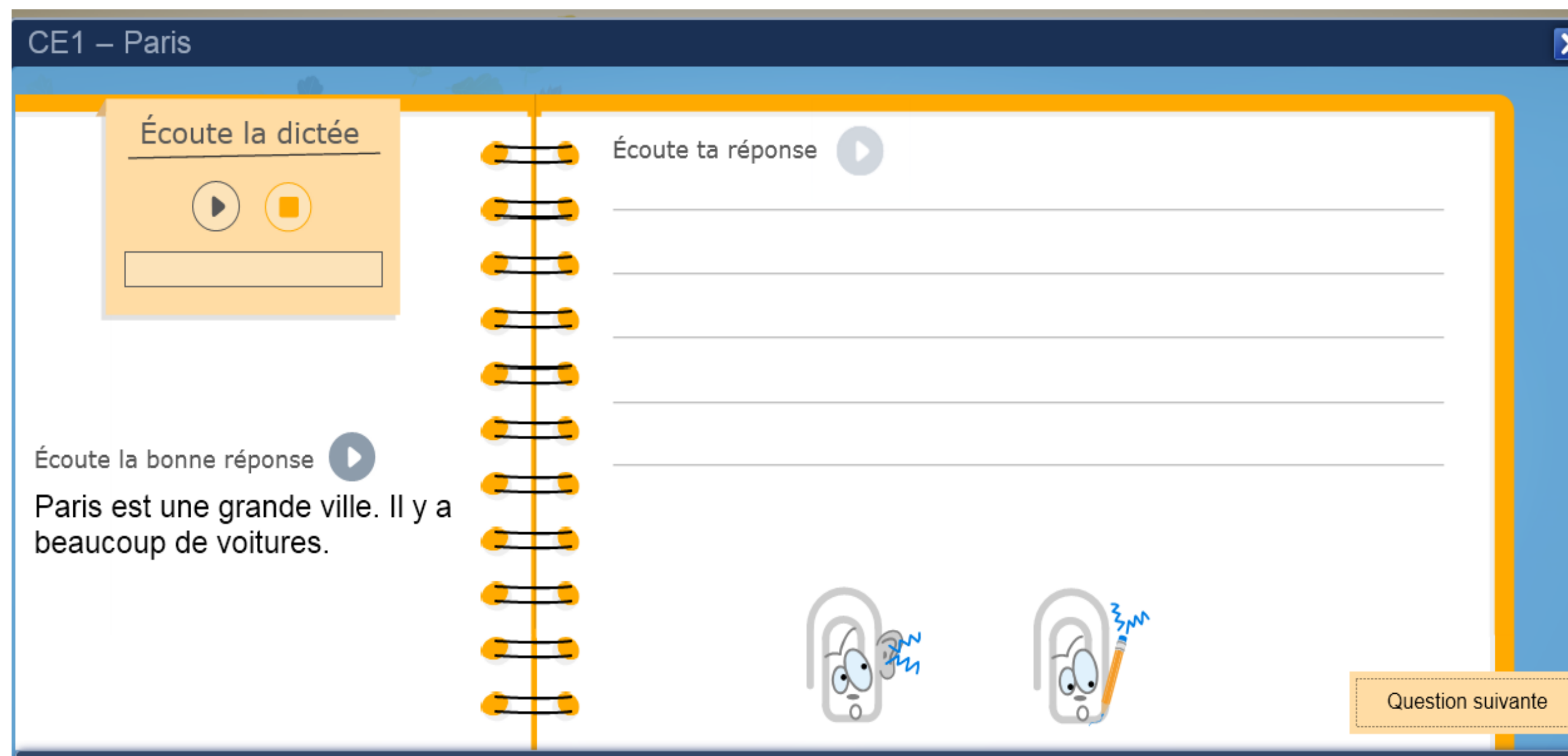
→ Students and teachers have been filmed and interviewed

Phase 2

→ Effects of audio feedback, study of the exercices' content

Specificity of the tool

- Feedback is provided by Text-to-Speech (TTS)
- It presents exercices for word segmentation, phonological associations, or discrimination and dictations in order to produce semi-guided or free text-writing (with only logorallies in the suggested vocabulary).
- A content generator will soon be included. It will allow teachers to create new exercices and students to correct sentences syntactically generated at random.
- Presence of a predictive text T9 standard program, a spelling and syntax checker.



Conclusion: Using speech synthesis is not enough to improve all written productions: « *Je fais l'escalade. je suis montée jusqu'en haut. cest can on grimpe* ». Listening with speech synthesis 4 times permitted to add « de »: « *Je fais de l'escalade .* ».

Thanks to an electronic dictionary, it becomes:

Je fais de l'escalade. Then « *Je fais de l'escalade* »/ *C'est can on grimpe* The pupil realizes that it is not well written by listening to the speech synthesis. The speech synthesis does not help to detect other errors. The electronic dictionary allows correcting:

C'est can on grimpe (electronic dictionary)

Adult says: « *It's good ?* »

Pupil answers: *No, because « de » is missing. How can I add « de » ? »*

- Capital letter. « *L'escalade* ». Space before the point: the word is shown as a problem also for this reason.

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