Computer tracking: collecting and analysing data on the learner behaviour

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What do learners do when working with web-based technology? How do they interact with such systems?
Objectives

• To present tools and techniques that we use to collect and analyse data on:
  - the learner behaviour
  - the task outcomes specific to the context of CALL design and development

• To discuss the relevance of these instruments in wider CALL contexts.
Mediated activity theory

- Mediated activities as socially and culturally constructed (Vygotsky, 1978)
- Educational ergonomics (Raby 2005)
- Role of the instrument (Verillon & Raberdel 1995)
A learner-centered approach

• Focusing on learners’ needs and collecting objective multiple data (Hubbard, 1992; Hémard, 1999; Levy, 2002; Colpaert, 2006; Park & Kinginger, 2010)

• Understand the changes that may/may not occur while a learner is actively engaged (Chapelle, 2003)

• Focusing on the processes of learning rather than outcomes alone (Felix, 2005)
A learner-centered approach

- Computer tracking, as a method of obtaining direct, objective feedback on the learner behaviour (Hubbard 2005; Fisher, 2007)
- Measuring the efficiency and effectiveness (Hamel & Caws, 2010)
- Calling on learners and teachers participation (Colpaert 2004; Hémard, 2003) throughout the development cycle of CALL applications
A learner-centered approach

tool

learner

analysis

data

intervention
Techniques

• Task design
  o Task conditions
    • Language learning potential; Learner fit; Meaning focus; Authenticity; Impact; Practicality (Chapelle, 2001)
  o Task context, focus and characteristics
    • Create task conditions providing opportunities for interaction with the tool (Laufer & Hill, 2000); convergent and challenging task (Ellis, 2003)
Tools

• Data collection
  o Camtasia, Jing, iShowU, Silverback, etc.
  o Video-capturing the learner-task-tool interaction at the computer
    • learner behaviour in real-time (process)
    • task outcome (product)

• Data analysis
  o Morae, etc.
  o Annotating and compiling markers inserted into video clips
    • process and product oriented parameters
    • quantitative and qualitative measures
Techniques

• Task analysis
  o Deconstructing the process
    • Empirical observations; steps involved
      o Expert users (teachers and learners) as models
        • Optimal task scenarios; goals
  o Defining process-oriented parameters
    • Data-driven, context specific; discrete markers
    • Visible (inter-)actions; meaningful
      o Time on task and efforts at task
Sample of data collected
Sample of data collected (+ talk-after protocol)

T1. Mots à traduire.

- Complétez (par un mot ou une expression) pour obtenir une expression équivalente en français.

1. a mild reproach: un ______ reproche
2. a fierce anger: une colère ______
3. an unquenchable thirst: une soif ______
4. to utterly forbid: dire totalement ______
5. to pay a compliment: ______ un compliment
Talk-after transcript (translated)

Researcher: Alright, we’re going to see again. Explain to me. Try and tell me what you’re doing again. You retyped, you typed «compliment».

Participant: Yes.

Researcher: What made you choose «A» or «B»? [between meaning A and B]

Participant: Hmm... it was just the first one.

Researcher: Yes?

Participant: I don’t know.

Researcher: At random.

Participant: Then, I was searching [it]. [in the collocates list bottom left]

Researcher: Mhmm

Participant: I didn’t find it.

Researcher: Mhmm

Participant: I didn’t know that the verbs were below... [in that list]

Researcher: You didn’t know that the verbs were below in the list of collocates? You didn’t select that dropdown list.

Participant: Correct.

Researcher: Ok.

Participant: So I saw... I was looking for the definition and...

Researcher: Yes. The definition that was « to say a compliment », is that right?

Participant: I chose «offrir» because, um, before searching the dictionary I thought «Oh! I had to give → offer a compliment»... and I saw it so...

Researcher: So you had already thought of that one. But you didn’t write it. You preferred to check it first.

Participant: Yes.
Sample of analyzed data
Data annotation

[Image of a computer screen showing a data annotation interface with a French text example and a marker tool interface]
Data compilation
Data exported in Excel

![Excel spreadsheet](image-url)
Conclusion

• Computer tracking tools and technologies in CALL
  
  o Opportunities
    • To collect rich, multimodal empirical data
      o centered on the learner (behaviour)
    • To produce a multiple purpose analysis
      o that can inform CALL (design) and SLA
  
  o Challenges
    • Being swamped by data!; costly analysis…
    • Triangulating data: consolidate methods to analyse multi-layered data
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