

Towards App-based Formative Feedback to Support Summarizing Skills

Citation for published version (APA):

Van Rosmalen, P., Kester, L., & Boshuizen, E. (2013). *Towards App-based Formative Feedback to Support Summarizing Skills*.

Document status and date:

Published: 10/12/2013

Document Version:

Peer reviewed version

Document license:

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- A submitted manuscript is the version of the article upon submission and before peer-review. There can be important differences between the submitted version and the official published version of record. People interested in the research are advised to contact the author for the final version of the publication, or visit the DOI to the publisher's website.
- The final author version and the galley proof are versions of the publication after peer review.
- The final published version features the final layout of the paper including the volume, issue and page numbers.

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Towards App-based Formative Feedback to Support Summarizing Skills

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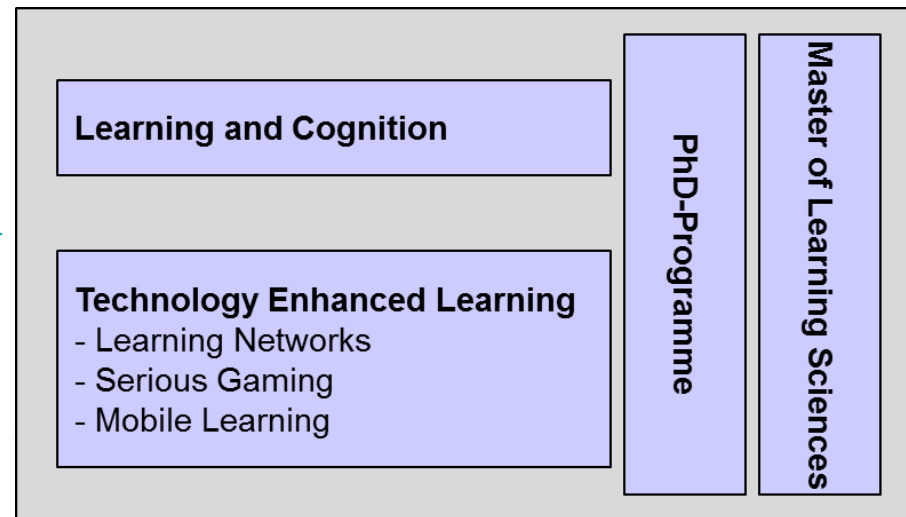
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Open University of the Netherlands

Centre for Learning Sciences and Technologies (CELSTEC)

1. Distance education (academic):
 - 6 bachelor; 13 master programmes
 - approx. 20000 students (part time: 60% working)
2. CELSTEC: 
 - Research & Innovation (100 fte) (learning sciences & technology-enhanced learning)



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Overview

- Summary Writing
- Visualisations & Language Technology
- WritLe
- Discussion



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Summary Writing

Summary Writing is a highly effective strategy to improve text comprehension, it:

- enables a student to link the text contents to existing prior knowledge.
- promotes self-testing which may help students to identify their comprehension gaps and fix them
- directs students' attention to important content parts

However, for the same reasons:

- It is complex and takes skill to write a summary
- It requires exercise and guidance



Summary Writing

- Formative assessment and guidance of student work is crucial but heavily constrained by the available staff time
- Technology can enable just in time support & (partly) automate the training and guidance
- More and more summary writing is about hypertext: locating, evaluating and using multiple (on-line) text sources



Summary Writing

Rule based training has been successfully applied (e.g.,
Bean & Steenwijk, 1984):

- 1) delete unnecessary or trivial material,
- 2) delete material that is important but redundant,
- 3) substitute a super-ordinate term for a list of items,
- 4) substitute a super-ordinate term for components of an action
- 5) select a topic sentence (focus sentence) or invent one

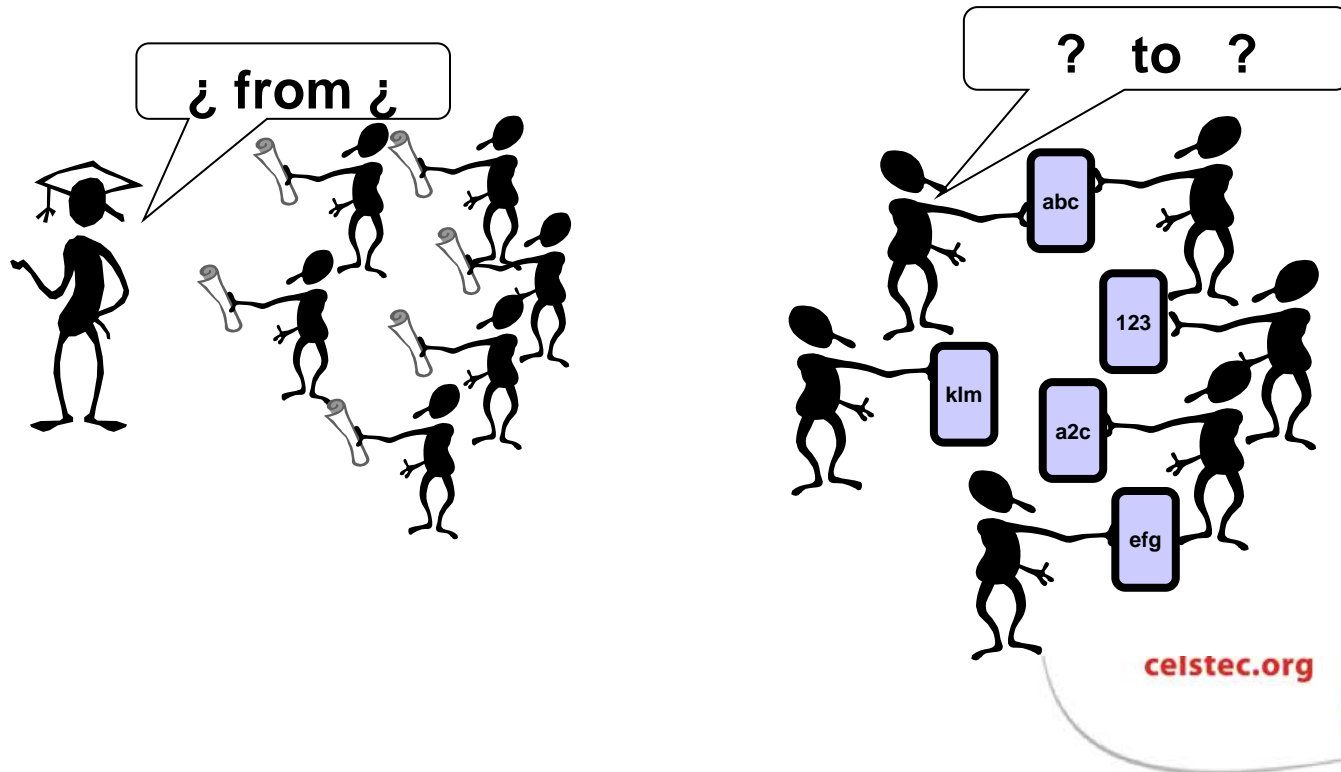
It works best in combination with other interventions e.g.
visualisations (Beesly & Apthorpe, 2010)



Summary Writing

Writing is an important part of school, academic life and social life (social media).

... Feedback on writing is important but labour intensive ...



Visualisation - Language Technologies

(1) a study using word clouds and concept maps to semi-automatically generate graphical visual representations of articles (Berlanga et al, 2012)

The authors were asked about:

- The quality of their text visualisation
- The value of a visualisation to compare and contrast

(2) A set of existing texts of students in medicine (discussion on symptoms, diagnosis and treatments for cholestasis). Size text: 150-200 words.

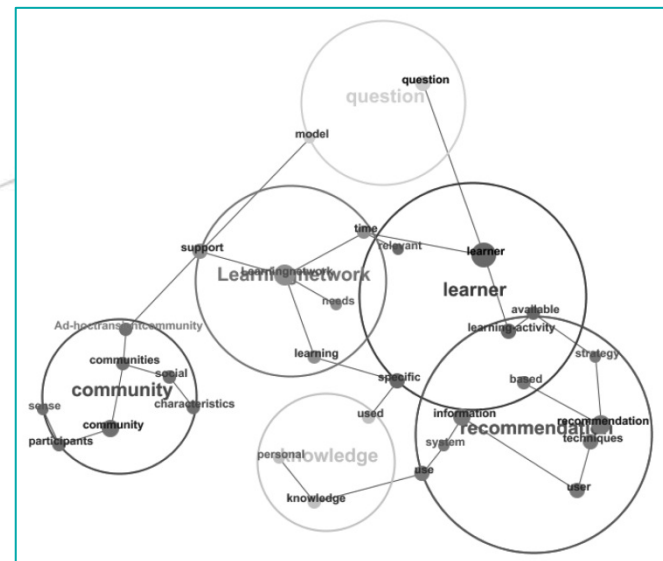
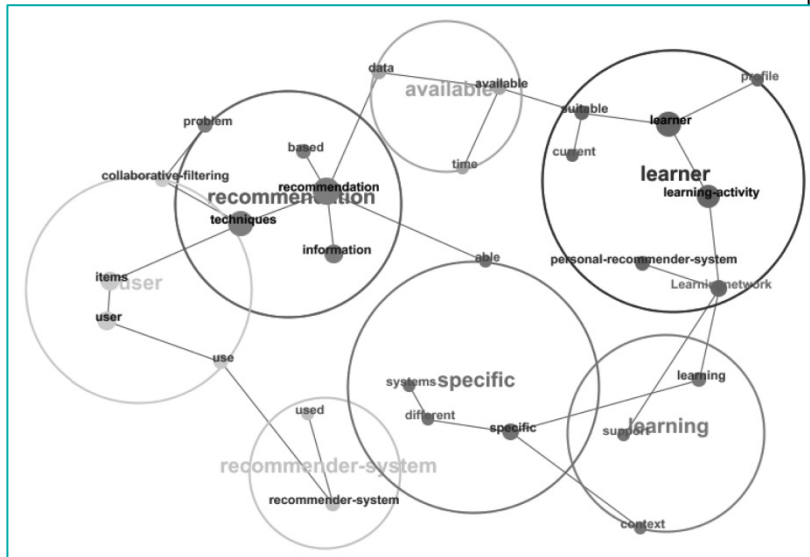
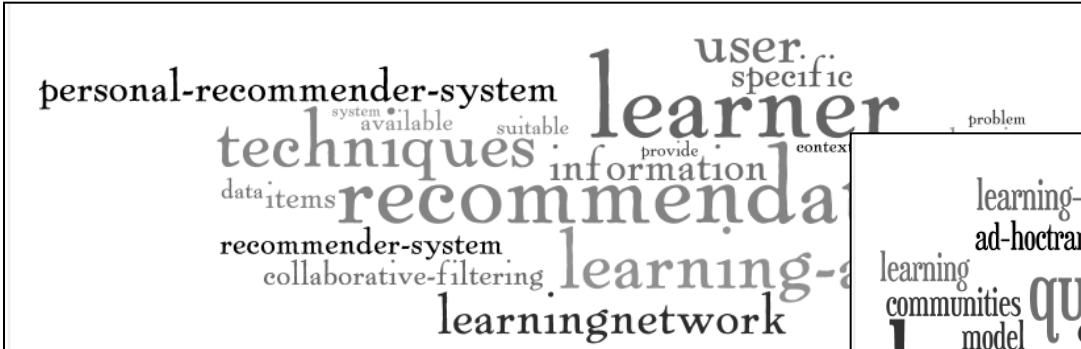
Objective:

- To get a first idea on text size requirements



Visualisation - Language Technologies (1)

Wordle



Leximancer

Visualisation - Language Technologies

Word clouds:

- adequately cover a text
- can be prepared without computationally demanding applications and without 'training' (e.g. large corpora, 'golden text')
- are for user relatively easy (single focus on content as opposed to e.g. concept maps which also include relations)
- are widely used, however, research in an educational context is limited

Word clouds as such are 'general purpose' so we do need improvements/extensions:

- Improved parsing (e.g. plurals: book-books, n-grams: secondary school, second world war)
- Integrated counting & visualisation (one cloud instead of two)
- Instructions & facilities aligned with summary writing



Read & Write - Analyse & Visualise - Discuss

I

The first two goals primarily focused on the Participatory effort, i.e. to what extent the platform did adhere to objectives to support activity within a system over a period of time. The extent these goals were considered is usability aspects and user experience, given the widely accepted view that technology acceptance is determined by the combination of perceived usefulness and perceived ease of use of the technology (DeLone and Tucci, 1999; To et al., 2008; 2010). Given the range of purposes and the wide varied design approaches followed, the target set out may result in to design and perform an expert based evaluation (Chaffin, 2003; Orlikowski, 2000). However, given the pragmatic nature of giving the project its own place it is worth to also considering to add separate expert evaluation and, even importantly, as how with the project's status on usability, we need to apply an expert based user evaluation accordingly. In this way, we could study the possible different frequency of the usability, to be prepared for the advantage of creating a complex process of strengths and weaknesses of the platform was more significant than the task to involve the users with necessary experience. It would also be a useful and qualitative design based on an interpretational or a variable able perspective. The expert evaluation was split in two parts: a usability evaluation concentrating on usability aspects, both general and usability aspects related to people, and user data validation concerning on the Participatory effort. The user related evaluation focused on both aspects. In summary the evaluation activities conducted were as follows:

- A usability evaluation comparing the platform with usability regarding usability features.
- A set of data validation comparing the platform with its original design.
- A set of user data to study the user's perspective both on perceived usefulness and user of it.

3.2 Method and data

As can be understood from the description on evaluation in the previous paragraphs, the idea about the design of the evaluation framework developed during the project. Also important was the fact that the combination of technical aspects and constraints for the nature of the user related design leads to a specific of these an individual evaluation method. This resulted in a large number of participants in both the evaluation method and the results on the one hand. On the other hand, it resulted in a large number of resources about the nature of the project. The nature of the analysis such as the design the method suggested a certain view about the nature of the project. However, at the time of the design of the project the resources were limited to what is the best choice or might to use. Further evaluation perspective that leads to the evaluation on a combined method, such as expert based, i.e. a usability evaluation and user data validation, and a user evaluation of the user time, to gather



I	shared	II
Ad-hoc transient community		Personal recommender system
Communities		System
Model	Learning activity	Suitable
Question	Learning	Specific
Time	Learning network	Problem
Specific	Recommendation	Provide
Knowledge	Available	Information
Social	User	Data
Support	Learner	Items
Information	Technique	Recommender system
Participants		Collaborative filtering
Community		Strategy
		context

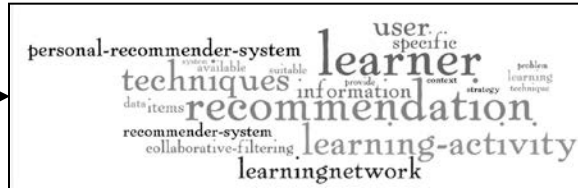
II

measures of effectiveness, efficiency, usability, flexibility and user satisfaction were used in the evaluation. To prepare the necessary system, we used an approach inspired by the "The Best Questionnaire Method" of Baski, Gálvez, and Estabill (1995) which offers systematically transformation of evaluation goals in a regular manner into metrics. This method allows questions with its total five metrics for the five evaluation goals (Table 2). The following data were collected:

- A background questionnaire. This questionnaire included general questions about e.g. study, work, and problem and usability specific questions, e.g. systems with usability comparison outside.
- A post questionnaire. It was designed around three items, i.e. user identifier (i.e. "I always have time to use the usability technique"), flexibility (i.e. "The content motivates support - i.e. recommendations - or remind the situation"), and perceived manager (i.e. "Over time, my partner will learn to share more and more their" and manager (i.e. "I always have time to use the usability technique").
- Observation notes. Each session was followed by a debriefing discussion to take notes on the progress made with the extension and the way the participants accomplished their tasks.
- System (usability) data. The results of the sessions were available for inspection and analysis. The session data given access to measurements such as: time spent and (time spent) which are used as the evaluation of related systems such as the following table (Chang, 2010).

Each of the user studies followed a similar, fixed setup:

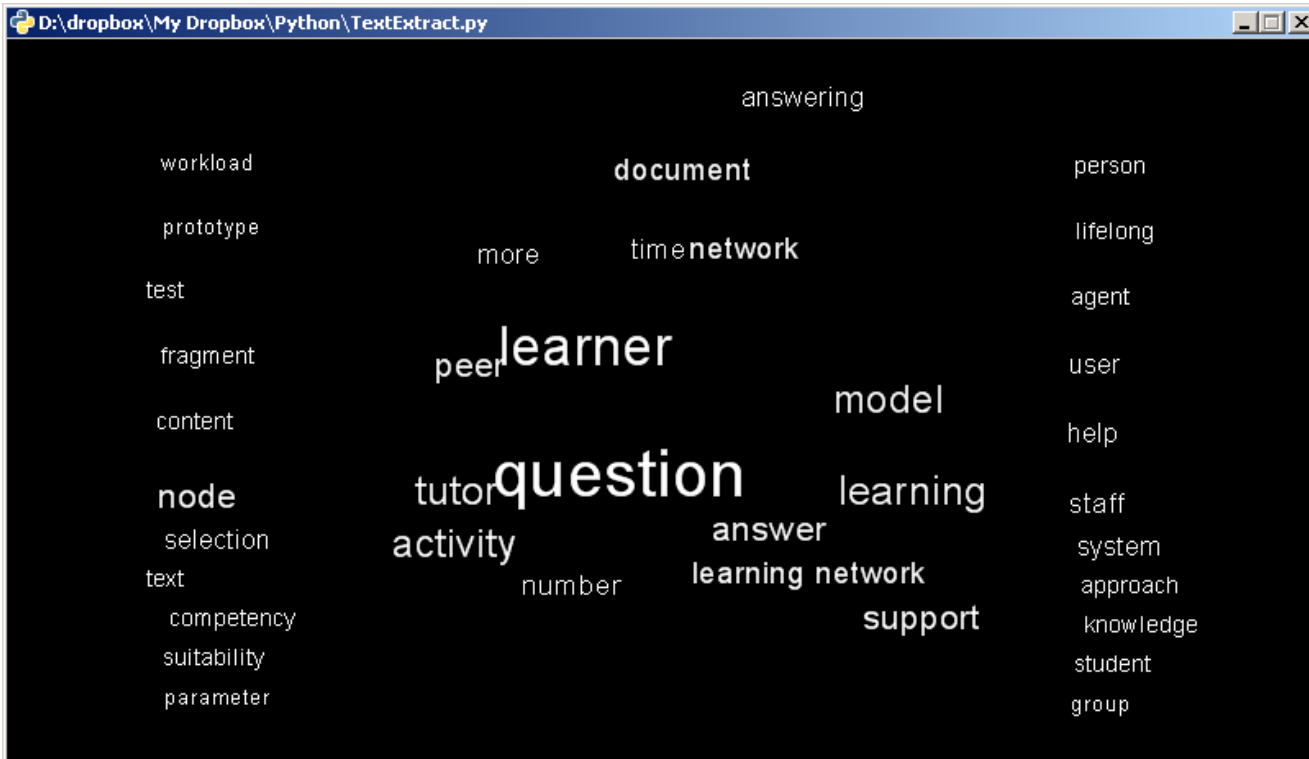
- User consented, an interview, a briefing package with background information on all aspects, the evaluation, and the background questionnaire.
- User received, as part of the evaluation, an introduction to all aspects and the system.
- User followed a scenario with 6 pre-designed tasks covering the main Participatory of the system in a realistic use environment on a given specific problem scenario. The tasks consisted of: (1) creating a User Profile; (2) creating a Project; (3) creating a Content Channel; (4) setting Goals; (5) Performing an Iterative Process and (6) finding a Solution. They included all relevant activities that are part of all aspects, i.e. setting up and implementing an iterative process, creating user data, managing data and design knowledge, collection of data (among ideas, meeting and involving them) and finally, evaluating and reflecting their



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WritLe Integrated Visualisation



WritLe:

Step 1 Input

Step 2 Parsing

Step 3 Comparing

Step 4 Visualisation

< student 1

shared

student 2 >

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Write interactions

(note: to be developed)

The screenshot shows a window titled "D:\dropbox\My Dropbox\Python\TextExtract.py". The main area contains a word cloud with terms such as "question", "learning", "network", "document", "learner", "activity", "answer", "support", "model", "learning network", "peer", "tutor", "number", "learning network", "support", "workload", "prototype", "test", "fragment", "content", "node", "selection", "text", "competency", "suitability", "parameter", "answering", "person", "lifelong", "agent", "user", "help", "staff", "system", "approach", "knowledge", "student", "group".

Add	Remove
	More time

Drag, drop & motivate



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WritLe Next steps

WritLe is still in its infancy. First, a “pencil & paper” evaluation will be done to gain qualitative feedback, with:

- a first set of interactions: identify synonyms; (ir)relevant concepts, superordinate, mark & annotation
- initial instructions
- in Dutch (to ease experimentation)

Next based on the results:

- Selection of format: game, collaborative or individual task
 - Choice of text to compare with (original, peer or teacher)



Questions & Discussion

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