

## Research Traineeships proposal

### 1. Project title

Diggit Paper Assist: Developing a digital writing tool for students

### 2. Coordinators

Tom van Nuenen, Department of Culture Studies

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### 3. Project Summary

Writing papers is one of the most important parts of the curriculum of any academic program. It is also one of the tasks that students complain about the most: many experience difficulties with the many aspects of a writing process, such as composition, data presentation, and referencing. Teachers, meanwhile, regularly express their dissatisfaction with the declining writing skills of students in the digital age, in which long-form writing has been replaced with fast-paced communication. Further, providing feedback to each individual student is considered a repetitive task by teachers, especially when the writing problems encountered are similar. This project aims to offer an interactive and smart solution to these issues, by developing a research-led tool to assist students with their writing tasks in academic genres and reduce the time teachers spend on providing feedback.

The development of a writing assistance tool has a myriad of pedagogic advantages. Writing instructions often consist of providing practical tips, as well as showing 'worst and best practices' from papers or theses from other students. A recurrent issue of such methods is that students are not always capable of transferring their knowledge of problems and solutions to their own writing. This tool assists in bridging the gap between understanding and implementation, without automatically correcting mistakes. In doing so, it supports students in an individual, process-oriented and pedagogically constructivist manner, by allowing students to take responsibility for their writing.

It should be noted that the field of electronic writing assistant software is not new: The KU Leuven offers a *Schrijfhulp*, which helps students and staff with matters of structure, style and spelling. Belgian newspaper De Standaard maintains a similar program called *Schrijfassistent* (De Standaard). The proposed tool, here, differs in that it applies different methods to respond to and learn from student writing: specifically, it applies keystroke analyses to learn about students' writing behavior and the problems they run into. With keystroke analysis, data can be collected automatically and real-time,

allowing for immediate feedback during writing. This can help the students to improve their writing without having to wait for teacher input.

The current project will revolve around the following research question:

**RQ:** How can honing writing skills be operationalized by a writing assistant tool?

SRQ1: What problems about writing papers are students and teachers experiencing?

SRQ2: How can problems in writing papers be automatically identified using techniques from Digital Humanities, such as keystroke analysis or computational linguistics?

SRQ3: What is the effect of feedback on these problems on students' writing?

The project fosters cooperation between the School of Humanities' Department of Culture Studies and the Department of Communication and Information Sciences. The collaborative aspects of the development in creation of the tool are manifold: most notably, it introduces recent developments in AI (specifically, keystroke analysis) to aid in solving pedagogical concerns about literary and journalistic skills that are important to the humanities at large.

The prospective tool will be integrated into DiggIt (<https://www.diggitmazine.com/>), the teaching platform of the Department of Culture Studies. As an academic news and information platform, DiggIt is aimed at offering quality information in times of digitalization, globalization, and superdiversity. It is a learning and publication instrument allowing students and teachers of Online Culture and Culture Studies to publish their content. They learn to promote their content through social media, and generate traffic for it. DiggIt functions as a pedagogical instrument and operates at the intersections of the university (with values like knowledge and standards of quality) and contemporary journalism (thematically: what is currently happening in society, but also stylistically: eye-catching titles, shorter paragraphs, readability). DiggIt has won an award for Best Teaching Innovation in October 2017. One of the project leaders works as an editor for DiggIt, and during the project we will have frequent consults with chief editor Ico Maly to discuss the kinds of opportunities that a digital writing assistance tool would be able to provide.

In its first phase, the project will develop and gather data using a writing response tool, implemented on the DiggIt Magazine website. This tool will collect the keystrokes during writing of articles for this platform. In addition, interview data will be collected on common problems in students' writing. In the second phase, the project will develop the proof of concept of a web app, provisionally titled *DiggIt Paper Assist*, which incorporates the findings of the research into an application that can be used by

students to improve their paper and essay writing. This software will incorporate different functionalities, based on the research performed in Phase 1. A few features that could potentially be implemented are:

- Feedback on writing strategies, such as planning and revision behaviour, stylistics, composition etc.
- A check for the entry of data used in papers: users have to tag the resources they are using to make an argument, which can then be used for a check when writing the main body (e.g. with a popup while writing that asks “how does this paragraph or sentence make use of data?”)
- Different parameters and settings corresponding to different academic genres: papers, essays, articles, etc.

Additionally, the final application will be available to use as a data gathering tool, and will be integrated to DiggIt’s analytics software. This will allow researchers and editors to continue to learn about the writing behavior of students.

The project will allow research assistants from both a qualitative research background and a programming / web design background to contribute to social innovation in the form of interdisciplinary and product-driven research.

#### 4. Project timeline

##### Phase 1 (months 1-3):

	Team A	Team B
Week 1-4	Literature review; interviewing teachers in academic writing; analyzing interviews	Development of writing response tool (see 3)
Week 5-8	SWOT analysis of comparable writing tools (e.g. KU Leuven’s Academic Writing Assistant)	Data gathering using writing response tool
Week 9-12	Data analysis & implementation into final app ( <i>deliverable #1</i> )	

**Phase 2 (months 4-6):**

	Team A	Team B
Week 1-4	Writing article on findings of writing response tool ( <i>deliverable #2</i> )	Development of the final tool, based on findings in Phase 1
Week 5-8	Finishing & submitting article to peer-reviewed journal and/or conference ( <i>deliverable #3</i> )	
Week 9-12	Evaluation of development; close co-operation in preparing tool for usability testing	

**Phase 3 (months 7-9):**

	Team A	Team B
Week 1-4	Usability testing of the different components of the software, including effect of feedback on writing	
Week 5-8		
Week 9-12	Evaluation of usability testing; planning of implementation of revised features	

**Phase 4 (months 10-12):** Final development of a proof-of-concept for the tool.

	Team A	Team B
Week 1-4	Writing article on development of final tool ( <i>deliverable #4</i> )	Final development of a proof-of-concept for the final tool ( <i>deliverable #6</i> )
Week 5-8	Finishing & submitting article to peer-reviewed journal and/or conference ( <i>deliverable #5</i> )	
Week 9-12	Assistance in development of final tool	

## **5. Research Trainee Profile**

### **Trainee 1**

Profile: MSc / ReMa

Tasks: Development of the software

Skills/knowledge: Computational linguistics, web-based programming and scripting languages (JavaScript, Python/R), web-based software development and design (HTML/CSS)

### **Trainee 2**

Profile: BA/MA/ReMa

Tasks: Research and performing usability feedback of the software

Skills/knowledge: interview design and analysis, ideally also web-based software development and design (HTML/CSS)

Importantly, both trainees will have to show creative thinking in order to operationalize commonly found problems pertaining to academic writing in terms of software-based solutions. Since we will be developing a web tool, we would prefer both trainees to have experience in web / UI design.

## **6. Required documents for application**

Applicants will be asked to send in a CV as well as a brief letter of interest to [tomvannuenen@gmail.com](mailto:tomvannuenen@gmail.com) or [m.a.conijn@uvvt.nl](mailto:m.a.conijn@uvvt.nl)