

# How to Enjoy Writing Papers: Supporting Literature-Based Inquiry Learning to Reduce Procrastination and Foster Ownership and Positive Emotions

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**Abstract:** Literature-based inquiry learning is a common form of instruction in the Humanities and Social Sciences but usually lacks the necessary support. In this paper, the effects of an online environment to support the literature-based inquiry process with scaffolds and prompted learning diaries are compared to unguided learning processes. We find a significant decrease in procrastination and a significant increase in perceived psychological ownership and positive emotions. In-depths interviews give insights into the learning process and epistemic emotions during the process when the supportive environment is used. Further data collection is currently in progress and will add to these findings.

## Introduction and theoretical background

A specific problem of literature-based inquiry learning is *procrastination* as research on academic writing has shown (Klingsieck & Golombek, 2016) resulting in lack of time to plan the process, apply effective strategies to accomplish relevant tasks, and reflect about the process – the three central components for successful self-regulated learning (Zimmerman, 2001). Unsuccessful self-regulation processes, in turn, lead to unpleasant emotions and aversive attitudes towards literature-based inquiry. Aversive attitudes towards a learning task have been shown to be major causes of further procrastination behavior (Steel, 2007). A sense of *psychological ownership*, i.e. the feeling that the written text is ‘mine’ or an ‘extended part of me’, has been found to be linked to perceived control, increased self-efficacy, and motivation (Pierce, Kostova, & Dirks, 2003), thus being conducive to pleasant emotions. Additionally, during learning processes, many different epistemic emotions of rather pleasant or unpleasant nature can occur that influence information processing and learning behavior.

In order to enable learners to efficiently self-regulate during literature-based inquiry learning and gain a sense of psychological ownership that can lead to pleasant epistemic emotions, guidance, structure, and information in moments of insecurity are necessary. A virtual environment can provide such support by making the activities of a literature-based inquiry process visible and by supporting the externalization of learners’ internal inquiry processes. In STEM areas, positive effects of *scaffolds* that provide an externalized schema of the steps of the inquiry-learning process and guide the learners through this process have extensively been found (e.g. de Jong, 2006). Additionally, learning diaries that include cognitive and metacognitive prompts have shown to be a good means of support for long-term learning processes such as the literature-based inquiry process, which usually takes several weeks of self-regulated work. (Berthold, Nückles & Renkl, 2007). These assumptions lead to the following research questions:

RQ 1: To what extent does a virtual environment that combines scaffolds and prompted learning diaries foster beneficial *learning processes* (reflection and decreased procrastination) during literature-based inquiry?

RQ 2: To what extent does a virtual environment that combines scaffolds and prompted learning diaries foster *learning outcomes* (positive emotions towards literature-based inquiry and psychological ownership for a term-paper) during literature-based inquiry?

## Methods

We used a design-based research approach that included data collection in the form of an experimental field study on different cohorts of students in a German Educational Science B.A. program as well as in-depths observation of the learning process of three individual students. The three cohorts consisted of a *baseline group* (N = 27), which did not receive specific support. We followed three of them while they tested the first version of the support instrument. The *experimental group of cycle 1* (N = 16) received access to the first version of the support instrument as part of an introductory course in Educational Science and scientific writing. The *experimental group of cycle 2* (data collection is still in progress) receives access to an improved version of the support instrument.

As a support instrument for the inquiry process of a literature-based term-paper, we designed the “Online-Research Log” which is set up in a moodle course as a work-flow-management-system. It visualizes the main necessary steps in a literature-based inquiry process by structuring each step according to three core elements: (a)

Setting concrete and terminated goals for the step, (b) conducting the whole step and uploading the result, (c) reflecting about the process, focusing especially on what has been learnt, problems that have been solved, and achieved goals. The support instrument was improved between cycle 1 and 2 regarding its overall outline (one step was broken down into two smaller steps), in the information available (an introduction video was added), and in the reflection prompts (a rating scale for current epistemic emotions was added).

All three groups were asked to fill in online-questionnaires, the experimental groups received a pre- and a post-test before they started and after they finished the inquiry process. The questionnaires include instruments to measure procrastination behavior during each step of the inquiry process, psychological ownership towards the term-paper, and state emotions towards future literature-based inquiry. Differences between the groups were analyzed using t-tests and Man-Whitney-U-tests. Additionally, we will analyze the reflection data. For the in-depths observation of the three individuals in the baseline group, who tested the first version of the support instrument, we conducted a series of interviews over a period of two months.

## Findings

When comparing the reported procrastination behavior during the seven steps of the inquiry process between the baseline group and the experimental group in cycle 1 (RQ 1), we found that the experimental group in cycle 1 reported significantly reduced procrastination behavior for most of the steps. During the in-depths observations, participants pointed out that the identifying and understanding appropriate literature was especially challenging for them. Furthermore, the in-depths analyses revealed that participants had problems in setting appropriate goals as well as reflecting efficiently. Looking at the outcomes of the literature-based inquiry process (RQ 2), we see a significant improvement in psychological ownership towards the term-paper and in positive emotions towards future literature-based inquiry for the experimental group in cycle 1 compared to the baseline group. In-depths analyses show a huge fluctuation of epistemic emotions during the process but for all participants a rapid decrease of fear when working with the Online-Research Log. The support instrument was improved accordingly, and we expect to reduce procrastination behavior in cycle 2.

## Conclusion and further plans for research

The preliminary results indicate that it seems possible to support learners during literature-based inquiry not only in cognitive aspects – which was the focus of previous research – but also in emotional and motivational aspects. Providing structure and guiding learners' reflections in an online environment seem to be a way to support complex inquiry processes that can otherwise hardly be supported sufficiently in a regular educational context. Furthermore, setting the focus on emotional aspects of inquiry learning could be important to better understand why learners are able and willing (or not) to use efficient learning strategies and show relevant learning activities related to tasks with which they have previous experiences.

However, the sample in this study is currently quite small and additional data is needed to validate these findings. Additionally, further analyses will show how learners' emotions change on a long-term basis, as well as on a short-term basis within the literature-based inquiry process when additional data of cycle 2 is available. Data about how aspects students reflect will give further insights into the learning and self-regulation process.

## References

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