

Exploring the Use of Mobile Technologies and Process Logs in Writing Research

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Abstract

The present article explores and evaluates a method that makes use of mobile technologies as tools in combination with process logs to study writing (the Mobile Technologies combined with Process Logs (MTPL) method). New and changing ways for doing writing as well as limitations with the methods already in use in writing research grounds for new approaches for studying this practice. This article evaluates how the MTPL method can contribute to writing research as well as what process-oriented knowledge could be gained. Possible risks with using the approach are also outlined. The MTPL method is evaluated in relation to some challenges set up for writing research. The method should be able to capture the in situ participants' view on improvisational times, locations, and activities as well as their view on other people as resources or disturbance. It should also be able to address longitudinal aspects of writing and the material as well as the digital artifact use. The MTPL method is mostly shown to address all of the challenges set up for evaluation. One of the main contributions shown with the method is that it opens up for multimodal reporting in situ, where photos of workplaces in an actual writing process are one such example. There are however some risks, the main one being the uncertain ethical implications of new digital technology. In spite of such risk, the MTPL method is seen as a promising tool that should be used and developed further to gain new insights into writing research.

Keywords

mobile technologies, process logs, writing research, MTPL method, writing studies, writing process

What Is Already Known?

Many studies have addressed issues relating to writing processes. However, writing studies with a new materialism view (Rule 2013) are not that common. Methods that are already used in writing research don't seem to highlight specific issues that is forwarded by such theoretical approach. In relation to this, the present study sets out to evaluate a method that could address such issues.

What This Paper Adds?

A method to grasp over writing processes specifically when seeing them as material, embodied, and dispersed.

Introduction

This article explores how mobile technologies combined with the reporting mode of process logs, here labeled the MTPL method, can be used to create and collect data on writing processes. In the light of new evolving techniques and the globalization and digitalization of the world, the activity of writing has certainly changed. Writing can today be performed with

various digital technologies. There are few people, if any, who now write only with pen and paper. Even if such artifacts are still used, digital writing devices can be seen as the main writing tool. As McKee and DeVoss (2007) state, writing is becoming more and more *digital* and that development should therefore also shape writing research: the questions asked; the sites studied; the methodologies put to use; the ethical issues taken into consideration; the conclusions drawn; and the action taken by scholars, researchers, and teachers (p. 3). Digital technologies add up even more ways in which and places where people can write. As a consequence, research also has to find new ways to capture this process. Digital technologies may have to be used more frequently also by researchers focused on writing. With the MTPL method, mobile technologies are used by writers themselves to report on their writing processes. In this article, the method is explored and evaluated for writing

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process research aims. The theoretical foundations that underpin this study see writing as an activity that is mediated, with a focus on material artifacts, embodiment, and place. With such a view, writing processes pose challenges when researched. The researcher is faced with the question of how to capture a writing activity that is, according to Hart-Davidson (2007), socially and culturally rich, technologically mediated, and temporarily and spatially distributed. In relation to such complexity, the benefits of using mobile technologies could be many.

Mobile technologies are widely used in today's society; they are accessible and easy to operate and offer possibilities for sharing data in many forms. The use of such technologies could open up for a new perspective on writing in research and should be tested for such aims. Combined with process logs, mobile technologies constitute the main foundation of the MTPL method which is explored and evaluated in the present article. The following research questions are addressed

- How can the MTPL method contribute to writing process research?
- What process-oriented knowledge can be gained compared to other methods already in use?
- What are the possible risks of using the MTPL method?

In order to answer these questions, 17 undergraduate students were asked to report on their writing process with the aid of mobile technologies. They reported on a specific writing process, represented by an academic assignment that varied in terms of length and scope. Their task was to report to the researcher with the aid of mobile technologies every time that they did something with their written assignment. This article starts out by giving an account of the theoretical foundations, above all cultural–historical activity theory (CHAT) and new materialism, that call for new ways of collecting data on writing. Further, data collection methods that are already used in writing research are outlined. In the subsequent section, the MTPL method is introduced, followed by a section on the study design. The results are provided as illustrations relating to the challenges that a writing researcher using the approach needs to address, and in the final section, those challenges are discussed in relation to the research questions asked.

Writing as Mediated Activity—A Cluster of Theories

Process has long been a central issue to the field of writing research, which originally emerged in dialogue with cognitive theories. The study of the writing process could be said to have started with Emig's (1971) descriptive study of student writing. She asked the question of how writing is accomplished, rather than prescribing how it should be done. The writing process itself, she claimed, was something that was worth teaching. The process research further got its greatest recognition with the writing process model introduced by Flower and Hayes (1981). Writing is primarily, according to the time-bound conceptions

of the process model, an act of the mind. Today's writing process research has however widened the scope of process inquiry to address issues of writing production in complex environments and as mediated activity. Ching and Van Ittersum (2013), for instance, explore how writers shape their composing processes through the use of digital tools. Shipka (2011) is concerned with the multimodality of composition and presents detailed narratives of writers' processes. Further, Prior (2004) discusses methods for tracing "how texts come into being" and highlights the importance of seeing writing as situated activity. This view corresponds to most research on writing processes today, moving away from a solely cognitivist perspective. It is in this context that the method evaluated here is relevant and useful.

The new view on process stems from a group of theories such as CHAT, distributed cognition, situated action perspectives, and actor network theory. They have in common that they share a key understanding of human behavior as influenced by material artifacts that are, themselves, understood as having a social and cultural meaning (Hart-Davidson, 2007, p. 157). New materialism theories, as presented by Rule (2013), and ecological models of writing, as forwarded by Dobrin (2011), can also be placed in this category. Recent research has thus emphasized the materiality and situatedness of writing. However, as Rule (2013) puts it "the most enduring conceptions of the *writing process* remain peculiarly disembodied and placeless" (p. 3 italics in original). The present study aims at addressing such limitations.

The theoretical foundation of the study is based on the assumption that writing is mediated but also regards writing as a material, embodied, and dispersed process. This view is in line with both Prior and Shipka (2003), who foreground CHAT, and Rule (2013), who grounds her study in a new materialism perspective. Prior and Shipka (2003) describe CHAT as theories that enable us to theorize writing acts as distributed and mediated (p. 231). They foreground writing activity as *dispersed* across different loosely bound acts of sitting and working and doing other things. It is also described as dispersed across series of writing episodes in a chain of textual invention and production (2003, p. 181). Methodologically, as Prior and Shipka (2003) state, private and public acts, meaning and sense, affect and attention, and tools and spaces need to be woven together into a single story of productive activity (p. 231). Rule foregrounds new materialism (Cole & Frost, 2010) as one important framework for a better grasp of writerly agency. Part of her focus concerns *material* aspects, generating a view that things matter and act. Rule (2013) states that new materialism provides a way to insist that the materiality of writing should be central to writing process inquiry, arguing that "we see writing and rhetorical acts as made possible by assemblages of entities" (p. 85). Further, the term *embodied*, also foregrounded by Rule (2013), provides a novel access point to writing process research, by focusing on the writer's physical body rather than his or her consciousness, rethinking writing as a physical activity (p. 9). This

theoretical foundation supports an examination of the “details of everyday writers’ situatedness, the environments, objects, and routine movements that comprise the physicality of writing processes” (Rule, 2013, p. 36).

In line with this theoretical view, writing is not to be seen as a smooth and easy activity, and it is hence not easily captured by any researcher. Writing, in Hart-Davidson’s (2007) words, “unfolds in the lived experiences of the writer” (p. 155). Given this connection between writing and experience, the method for studying writing needs to be able to capture the details of writing activities, how things, bodies, and places matter and act in specific situations, in actual writing moments and at the actual places of writing. In the following, the MTPL method is evaluated against such claims.

Data Collection Methods in Writing Process Research

In this section, the methods generally used in writing process research are presented. Such research is often based on multiple methods; however, one method often stands out as the most significant. The account of the methods presented here is intended to show in what way it may be profitable to explore and evaluate new methodological approaches, specifically in relation to the theoretical view and research focus presented in the section above.

When using *think aloud protocols* participating writers often write in laboratory settings, talking out loud to a recorder about what they are doing at a specific moment of writing. By doing this, writing seen as an internal process is externalized. Such research has generated valuable insights into the writing process, the most enduring one represented by the writing process model (Flower & Hayes, 1981). The model describes the cognitive subprocesses of planning, translating, and reviewing (this model has later on been modified). Such models however have limitations in the sense that they tend to overlook writing activities that are distributed over days, weeks, and years and hence do not take complexity into consideration (Hart-Davidson, 2007, p. 158). Geisler and Slattery (2007) further state that it is not given that a person’s consciousness during a given activity is possible to verbalize and then the think aloud protocol becomes incomplete. Moreover, if participants turn their attention toward communicating with the researcher and away from the activity at hand, their activity may be distorted (p. 187). Think aloud protocols are, as a consequence, seldom used in today’s writing research.

With new digital techniques, *keystroke logging programs* have instead become a new and interesting way to collect data on writing. These are software programs where keystrokes on the computer are registered, which allows for a fine-grained and time-based analysis of writing sessions (Leijten, Waes, Schriver, & Hayes, 2014). Leijten, Waes, Schriver, and Hayes (2014) showed that keystroke logging allows for different perspectives in analyzing data relating to writing from multiple sources and that it provides macroperspectives as well as

possibilities for fine-grained microanalysis. However, they also conclude that, to be profitable, it should be used with other complementary methods (p. 333). Further, the keystroke logging program mostly captures writing as inscription, as putting words on a digital screen, and does not provide insight into writing in other material conditions or writing as other activities than inscription. The massive amount of data created makes keystroke logging more difficult to use in longitudinal studies of writing processes, at least for now, and also impedes following several writers at a time as the researcher could be overwhelmed by details.

Using *screen films* (e.g., Kirkpatrick & Klein, 2016) is another option that captures digital writing sessions, focusing not on the keystrokes but on the actions taking place on the screen. Other aspects may also be possible to extract from screen films compared to keystroke logging data, such as multi-modal characteristics or divided screens.

Interviews are a common way to gather data on the writing process, and most of the studies presented above make use of interviews in some way to collect material. It is the main method used in several studies of writing processes (e.g., Pigg et al., 2014; Prior & Shipka, 2003; Roozen, 2010; Rule, 2013). In short, data collected through interviews represent retrospective accounts of writing. Prior and Shipka (2003) acknowledge that interviews do not entail in situ practices (also Pigg et al., 2014; Roozen, 2010). Consequently, they cannot match how these accounts add up with, for example, an actual video-recorded writing session. However, they point out that these retrospective accounts often range over years of experience, that is, processes that would be very hard to capture with more in situ methods (Prior & Shipka, 2003, p. 186). The inherent weakness, Hart-Davidson (2007) claims, is that only those events that stand out as significant for writers after some time has elapsed will be noticed. Further, he notes that “writers working fluently do not usually notice the role that technology plays in the moment-by-moment practices unless these technologies cause breakdowns” (p. 159). In the light of the theoretical framing that argues for detailed views of at the moment practices, this is a fundamental limitation with using only interviews as collecting method.

Observations, which could be performed alongside or compared with *video recordings* of writing sessions, offer one way to capture the in situ practices of writers. The disadvantage is that it could be time-consuming (for researchers) and that writers need to define beforehand when and where they are going to write, as the researcher needs to be able to be there, or to stage a camera at that time and place. O’Hara, Taylor, Newman, and Sellen (2002) who study the use of source materials by different professional writers, video-recorded, observed, and interviewed their writer participants. They present a rich picture of these writers’ use of digital as well as material sources in their writing. Rule (2013) also makes use of video recordings in her study of academic writing processes. She states that this is a rather “untapped resource for investigating writing practices”(p. 109) and adds that it enables researchers to study writing as an embodied activity. She however also reports

technical difficulties and problems related to the need to stage cameras (Rule, 2013). It is possible to let participants take control over the video recordings which opens up for a less time-consuming research and the possibility to capture “improvisational writing.” However, it also involves weaknesses, one being the researcher losing control over the collection process.

Mobile Technologies and Process Logs: The MTPL Method

The present article explores and evaluates how mobile technologies in combination with the reporting mode of process logs (the MTPL method) can be used as a viable technique to complement methods of writing research already in use. In the following section, the method is presented in more detail, and the design of the study is outlined.

Mobile Technologies as Tools in Earlier Research

Mobile technologies are portable equipment that can capture and create different forms of media; collect, share, and store data; and can be connected to the Internet. One promising aspect of mobile technologies is their availability. Mobile phones, for instance, are being used by an increasing number of people in today’s society. In Sweden, most students have access to smartphones or similar digital technology.¹ In spite of their availability, relatively little attention has, up to now, been paid to the opportunities that these technologies offer when used specifically as research tools. One such study has however been performed by Beddall-Hill, Abdul, and Saleh (2011, p. 86), investigating how mobile technologies can be used as research instruments in an educational context. They conclude that these tools can enable a new kind of research where material can be collected and handled more easily. Mobile technologies also enable studies that follow participants on the move (2011, p. 86). Further, Lachmann, Ponzer, Johansson, Benson, and Karlgren (2013) discuss the possibilities of mobile technologies for survey studies. With the use of such technologies, informants do not have to generalize about their experiences in retrospect but can instead answer surveys in their actual context. Lachman et al. see these tools as promising, but also highlight possible ethical risks that could be inherent in the use of such devices. The present study does not make use of surveys; however, it benefits from the ability to capture participants’ views at specific moments. Pigg et al. (2014), in a writing study project, make use of the in situ possibilities of mobile technologies, by sending Short Message Service (SMS) text messages to participants with prompts to respond to questions at different times throughout the day (p. 31). By doing this, they can, for instance, tell what participants actually are writing at specific moments. Their study is highly relevant for the present one, as their use of prompts and mobile technologies in many ways resembles the collecting method in this study. However, the studies also differ in their research focus and the different modes of data gathered.

Process Logs

Process logs here represent written logs on writing activities. They are presented by Prior (2004) as a collecting method where writers keep a log on a daily basis, reporting on the activities that they engage in and their thoughts relating to their writing. Process logs used in the present study also take inspiration from what Hart-Davidson labels time use diaries. He describes time use diaries as a qualitative technique, wherein research participants keep detailed records of their time usage relative to a specific activity or a broader domain of activity (Hart-Davidson, 2007, p. 154). The value, he argues, is that time use diaries can capture data that are otherwise difficult to collect since every moment, in every location, may have an importance for writing. The reporting is of course structured a great deal by prompts from the researcher. Nevertheless, it also has much in common with the notion of a “diary,” a genre of self-reporting and self-reflection. It is also a tool for dialogue between the researcher and the informant (Hart-Davidson, 2007). The reporting done by means of time use diaries is highly individual to each participant and, according to Hart-Davidson (2007, pp. 157–158), it puts minimal constraints upon the participants, as it is not an obtrusive measure, but minimally intrusive. The contribution of the time use diary, he further claims, is that it offers a first person view of action that is “typically too complex, too spread out in time and space, too internal to an individual, or too minutely detailed for a third person perspective to capture effectively” (pp. 157–158). The first person view and the individual reporting also pose some challenges, of course, as it could be said to be a partly biased method. Therefore, it should be complemented with other methods that allow the researcher to account for shifting perspectives and to compare data across individuals. Time use diaries offer possibilities for detailed accounts, expansive and longitudinal studies, and studies over text life cycles from invention to repetition in multiple contexts (Hart-Davidson, 2007). Process logs and time use diaries are seen as similar ways of collecting data on writing. In the present study, however, the term process log is used, as there is no specific focus on time use.

The MTPL Method

This study aims at enriching accounts on writing created by means of the more traditional process logs by adding the evolving potential of mobile technologies. When sharing process logs through such technologies, the participants can create different data types more easily and share them with the researcher at specific times and from different places. In this way, the MTPL method represents a new way to collect data on writing processes. The specifics of how the data have been collected in the present study are presented in the section below.

Study Design

The MTPL method presupposes that the participants report on their writing in the form of process logs (“the diary,” written

notations) through a mobile technology (mobile phone, tablet, and portable computer) but also that they share other complementing material (video recordings, screen films, maps, drafts and other texts, handwritten as well as digital). In the following section, the design of the MTPL method is presented and the conditions for evaluation are outlined.

Data Collection and Creation

In the study, 17 students enrolled in undergraduate programs (mainly teacher training programs) participated. A presentation of the research project was given to the students in their classes and the students who signed up for more information were then e-mailed with specific details on what the study demanded. Mainly, the instructions given were to keep a “digital diary” on their writing everyday with the aid of an application primarily able to capture photos and written texts. The “diary” was supposed to be written every time that they had done something with the specific written assignment. All of the students were urged to take photos of their workplaces and the resources used while writing. They were asked to write about where they wrote and what they did while writing, how it went, what they felt, or anything that they thought mattered in their work. Dates and times were recorded automatically by the applications used. Throughout the process, individual contact was upheld by the researcher with all of the participants. Mostly, this was done through the chat function in the application. These interactions mostly contained reminders (prompts, see, e.g., Pigg et al., 2014) on most working days to report on the writing done, as well as discussions on how to design the reporting individually to work well for all of the participating students (discussing issues such as “which application and technique?,” “how often?,” and “what to report?”). In some cases, follow-up questions were posted to the participants, making the MTPL method a way to perform digital interviews at the actual moment of experience (or close to it). The study focuses specifically on writing that the student himself or herself connects to a specific writing process, which is represented here by 2-week writing assignments (spring 2014/autumn 2015) but also final essays written over 10 weeks (spring 2016/autumn 2016). This focus differentiates the present study from several earlier ones (for instance, Pigg et al., 2014; Rule, 2013) which focused on all writing performed, not a specific process.² Most of the participants are teacher students (except for one student studying anthropology). The content of their writing is all connected to educational issues. All papers and essays were graded individually; thus, there was no collaboration intended in the assignments as such.

The data gained in the applications contained written notations, photos, some audio recordings, maps, and drawings. Mostly, the application Evernote was used (as suggested by the researcher). Other applications (Mental Note, Instagram, and WhatsApp!) were chosen by a few participants, as they felt more familiar with their appearance. All of the applications are similar in their function to create and share photos and written

texts and also their function to maintain contact between the researcher and the participants (through chat functions mostly). Evernote, as the main example, is described as a web-based working area that can be used from most digital devices. One can use either the subscription version or the free one that has fewer functions. Evernote is connected with the user’s e-mail account. There are possibilities of sharing notes, photos, documents, videos, and sketches with other members. Evernote also offers the possibility to record audio. The process logs reported in different applications were complemented with data created and shared in other ways. All of the students shared their drafts throughout the process (minimally once a day, if writing) by e-mail or cloud functions (Google Drive, One Note). Five students agreed to make screen films while writing, and eight students staged their mobile technology (or were recorded by the researcher) to make video recordings of themselves at these moments (also shared with cloud functions). These data are also part of the MTPL-generated data but differ from the process logs (in the form of written notations or audio recordings), as it does not represent the participants’ own perceptions of writing. However, the collection of data is still controlled by the participant, instead of the researcher. The data generated are represented in Table 1.

The MTPL method generates two types of data (presented in Table 2): data created in the form of process logs (“the diary,” written notations, and audio recordings), representing the participants’ perceptions, as well as complementing data in the form of maps, drafts and other texts, screen films, and video recordings.

Conditions for Evaluation

The conditions for evaluation of the MTPL method are set up to address challenges that writing research faces (Hart-Davidson, 2007; Prior, 2004), as well as tenets for writing process research out of a new materialism view (Rule, 2013). Seeing writing as a material, embodied, and dispersed process calls for a focus on the details of how writing processes are upheld. To do this, writers need to be followed during all of their writing for the researcher to be able to monitor the effect of artifacts, bodies, and places at detailed and specific moments. Given this requirement, one challenge is that writing often unfolds in an improvisational way in response to a rhetorical situation, a social and organizational setting, and the immediate physical surroundings the writer finds himself or herself in (Hart-Davidson, 2007, p. 156). It can thus take place at a variety of times and locations and could be comprised of varied and unexpected activities. The difficulty for the researcher lies in being able to follow such improvised writing, or even planned writing sessions, at all times. Studies may be even more difficult to perform if the writing process takes place over long periods of time. Further, the importance of artifacts, peoples, and places is not necessarily easily observed by the researcher, as it is the writer herself who is most aware of how those aspects influence writing in every moment. Laboratory studies and the use of only keystroke logging programs or screen films are not alone viable methods for capturing the

Table 1. Four Collecting Phases of the Study, Students Who Participated, Writing Assignment and Content, Applications Used, and Types of Data Generated by the MTPL Method.

Collecting phases	Spring 2014	Autumn 2015	Spring 2016	Autumn 2016
No. of participants	4	3	8	3
Writing assignment	Paper writing 2 weeks	Paper writing 2 weeks	Essay writing 10 weeks	Essay writing 10 weeks
Content of writing	Teacher students (4): Educational	Teachers students (3): Educational	Anthropology student (1): Educational Teacher students (7): Educational	Teacher students (3): Educational
Applications used	Evernote (3) Mental note (1)	Evernote (2) Instagram (1)	Evernote (6) WhatsApp! (2)	Evernote (3)
Type of data created with MTPL	Written texts (4) Photos (4) Audio recordings (1) Drawings (1)	Written texts (3) Photos (3) Drafts (3)	Written texts (8) Photos (8) Maps (1) Video recordings (5) Screen films (4) Drafts (8)	Written texts (3) Photos (3) Video recordings (3) Screen films (3) Drafts (3)

Note. Numbers of students are accounted for in parentheses.

Table 2. Different Data Types Generated by the MTPL Method.

MTPL Method	Data Type
Process logs (diary, participant perceptions)	Written notations (audio recordings)
Complementing data	Photos Drafts Other texts (handwritten or digital) Screen films Video recordings Maps

- Locations
- Activities
- Times
- People
- Resources (digital and material).

The method should further be able to generate subjective as well as more neutral data on writing, multimodal data types, and a view on writing that can capture the details of every writing session.

complexity of the writing process. Interviews are more relevant; however, they come with other limitations, one being that they are performed in retrospect. The method also needs to be able to capture the participants' *concurrent* perception of writing during their process (Hart-Davidson, 2007, p. 156; Prior, 2004). As Rule (2013) argues, the method needs to address not only subjective impressions but also more neutral representations of writing sessions (p. 100). Rule (2013) also highlights the ability to generate *multimodal representations* and the possibility to *embrace the particular* ("the small-scale, the minutiae, particularities of a given scene or situation", p. 100).

Given these aspects, writing process research, specifically if the writing process is seen as material, embodied, and dispersed, needs to be able to capture the details of writing processes in specific moments, as different activities, at different times and locations. It also needs to address the importance of resources, peoples, and places. The MTPL method is evaluated in relation to its potential for generating data on concurrent, participant views on improvisational or expected writing sessions, for major or minor writing assignments. The method should be able to capture such aspects of writing as:

Results

In the following section, the results are presented under two main headings. The first section makes a case for data that were generated by the method. The second part presents illustrations of how the challenges and conditions of the study were, or were not, addressed by the MTPL method.

Data Collected and Created

The data generated in the present study have different multimodal characteristics. It contains most of all written texts, such as the process logs, but also drafts collected during the writing process. The process logs contain responses to questions asked by the researcher, in the instruction given or during the process, and therefore in some sense could be managed as a kind of transcript of a written dialogue. An example of a written process log, containing a question from the researcher, is presented below:

- Sanna: Today I work at the café Victoria. I will try to write on the methods-part. Today. The rest of the week, I don't know. It feels pretty stressful right now. Its a lot of work left. I put up a copy of the document now. There is more in the latest version as I were writing some things this Saturday in the library. Tomorrow

Table 3. Amount of Data Produced by Two Participating Students During the Spring of 2016.

Participant	Data Collected With the MTPL Method					
	Written Notations	Photos	Screen Films	Video Recordings	Drafts and Other Digital Texts	Handwritten Notes
Eli	19,261 words	150 (maps included)	24 hr	5, 6 hr	156	Yes
Benji	8,099 words	73	No	No	41	Yes

- we have a seminar so I have to read the others text today (last Fridays cancelled one).
- Researcher: I saw your post this Saturday. Why do you sit there at the library if you don't like it?
- Sanna: I had decided to meet up with S and she had decided where to sit J It felt to disturbing to change place. There are other places that I prefer but it is not always possible to get a seat there (March 21, 2016, translated from Swedish to English by the author).

Further, the data contain photos of the workplace and of other aspects (examples in the following sections) which complement the written notations given in the process logs. Also screen films and video recordings represent such complements. The multimodal characteristics inherited in such data could pose challenges in the analysis. However, they also represent an enrichment of the analysis of only written texts. Multimodality is also, according to Rule, a characteristic that data on writing processes should embrace.

The data collected and created in this study were shown to vary in a great extent, an aspect that Hart-Davidson (2007) addresses when he describes the use of time use diaries (p. 163). The prompts that were given to the participants did not strictly define what counted as “working on the written assignment” and thus some students may have perceived this work as relating only to the inscription process, while others defined writing as a much more comprehensive process (composition). Sally reports often on activities not involving actual inscription, whereas Benji almost only reports on activities which do (see examples in the following sections). The participants' view on writing could also affect how they are staging and performing the actual writing taking place. The writing processes reported are certainly very varied. However, such subjective views are complemented by more neutral representations, such as photos, screen films, video recordings of writing sessions, and collected drafts. The collection of such data is here controlled by the participant; however, it does not reveal the participant perspective in the same way as the written notations of writing sessions (the diary). This type of data is thus a good complement to the view on process given by the students.

To exemplify how the data gathered varied in extent according to who was reporting, the amount of data reported by Eli and Benji (spring 2016) is presented in Table 3. Eli is the student who reported the most extensively during his essay writing and also gathered several different types of data, while Benji is one of the students who reported the least. The various

amount of data created are probably partly a result of the study design which includes an openness in the instructions given to the students. The decisions on how to report were often handed to the participants themselves, as their view of writing was in focus. In the case presented in Table 3, for instance, this resulted in Benji's choice not to participate in video recording of any kind (how the different data types varied in relation to number of participants is presented in earlier sections, Table 1).

The differences in the data produced by different participants pose challenges when using the MTPL method. However, they are also a result of different perceptions on writing and of different working approaches to, in this case, academic writing. In Table 3, the differences in the amount of words reported in the written notations (the diary) in some way also reflect the amount of text written as part of the assignment. How such differences and perceptions are related is however not a question to answer in the present article, but such issues should be addressed in further research specifically making use of the MTPL method.

Illustrations

In the following section, some empirical examples from the study will be presented and discussed in relation to the conditions that have been outlined for exploring the MTPL method. The subheadings in this section represent those conditions and how they are addressed by the data collection technique.

Locations, activities, and times. The data that are generated with the MTPL method often represents writing at locations, as activities and at times that are conventional; working with pen and paper, with a computer, or reading a book at a work desk in the daytime. However, there are also data on more unexpected activities, where writing is perceived and reported on by the students as something more than just inscription. Improvisational or not, such activities are difficult to render without the concurrent participant views that are shown to be generated by the method. The unexpected activities are also linked to the places and times of writing, as such activities often take place at unforeseen locations and times. Examples of such unexpected writing are given below in the form of photographs and written texts. The participants report on moments drinking beer, riding the bus, or lying in bed (Figures 1 and 2), as in some way connected to their, in these cases, essay writing. The data thus show interesting glimpses of writers' own perception of their process, which are enriched by the photographs of the workplaces.

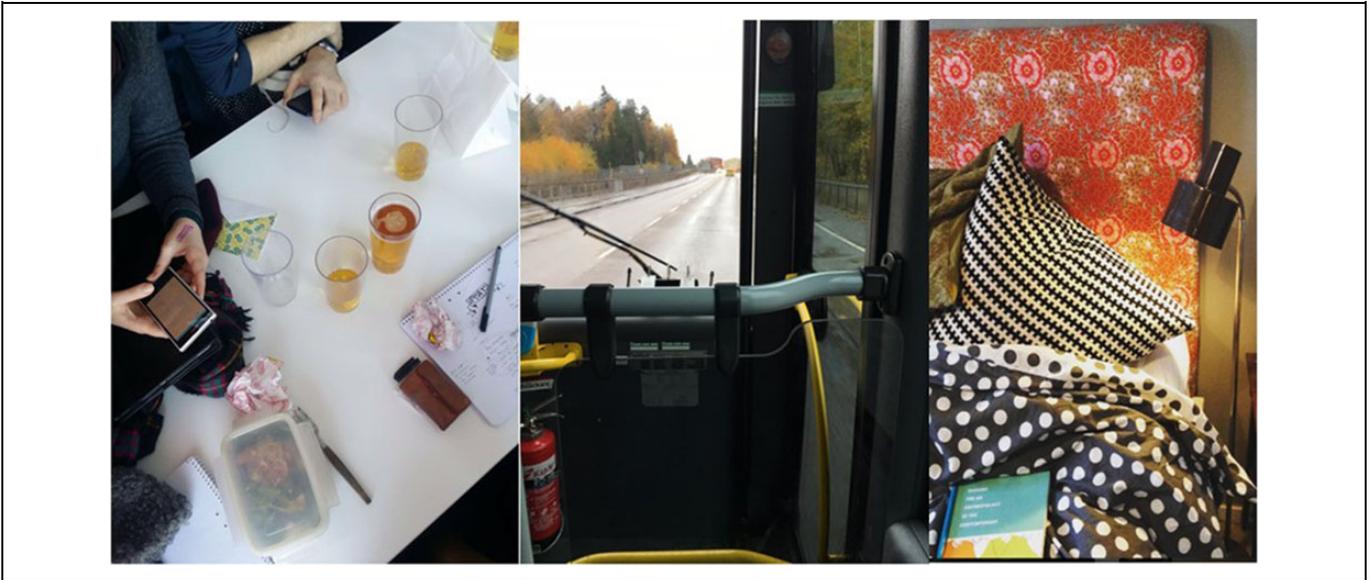


Figure 1. Unexpected activities and locations of the writing process: drinking beer, eating, and writing a mind map with friends (January 22); Daniel feeling content reading on the bus (October 25); and Petra reading in bed (November 16).



Figure 2. Sally's unexpected locations and activities of writing: "The borders are blurry" (February 25), "all suggestions are welcomed" (January 23), and "I don't know if you see the coffee cup but here I sat and went through my Introduction and Earlier research today" (April 11).

Sally is one of the students who often report writing as unexpected activities at unexpected times and places. She reports reading the newspaper at breakfast while thinking about what to write in her essay but also describes drinking coffee and coping with family life as part of her writing (Figures 1 and 2). Sally's perception of the writing process is pictured as widely dispersed, at unforeseen times and places, and comprised of many different activities apart from inscription.

The data further show student writers who have to set up and regulate their own writing places (they have no regular office),

which in turn can make them more varied and unpredictable. When studying student writing, the ability to capture such places is of vital importance. Writing, with the MTPL method, is also shown to be *on the move*. The one student that moves the most is Eli, who lives in two different towns in Sweden, and therefore commutes a great deal. He reports frequently of writing his essay on trains (Figure 3). As the application Evernote offers the possibility to create maps over posts, it has also been possible to map Eli's whereabouts at those specific moments (map used with permission of Eli).

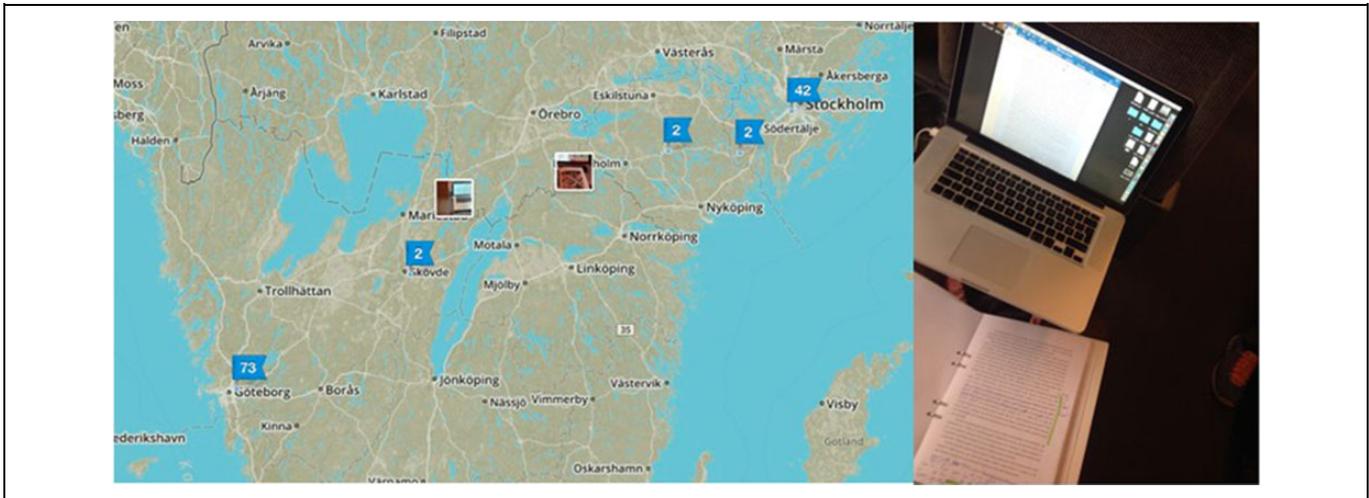


Figure 3. Maps from Eli's logs in Evernote, on the train from Stockholm to Gothenburg (distance 450 km), and a photo of how Eli is writing on the train (April 15).



Figure 4. Photos of some of Petra's working places. From the left: the university library, her sister's apartment, writing on a train between Stockholm and Malmö, and a café.

Petra is also a student who moves around, changing her writing places frequently. The MTPL method opens up for her reporting, with photos as well as written notations, on these occasions. The overall data also show how she is using different places (Figure 4) for different activities as the restrictions and possibilities of these environments differ a great deal. Petra's photos, and the corresponding written notations, can show how writing activities and places relate. Adding the drafts collected to such analysis renders views of the inscription taking place, if there is any.

There are, however, usually more common places to write and these are thus also represented in the data generated by the MTPL method. One such place is the study hall at the university. Here students often seem to meet and write together, in these specific cases, always with their own assignments. These places are often occupied throughout the day, as is seen in Figure 5.

Photos of concurrent workplaces are unique to the MTPL method. Figure 5 shows the working area before and after the students inhabit it for a day of work. These photos can show how important it is for the students themselves to stage their

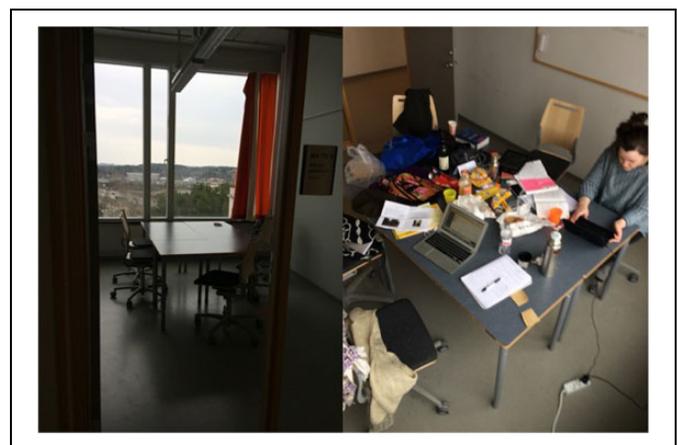


Figure 5. Scenes of writing: Sally trying to finish her assignment (April 16). Working area in the morning before starting to write and the same area in the afternoon.

scenes of writing, while also coping with factors that they cannot influence. One such factor is the access to a spot for writing, such as the one above at the university, a working area



Figure 6. Daniel working together with friends at the university working area (October 12) and photo of Ignazio's workplace in solitude (April 11).

that is often occupied and that they cannot leave while they are there (since someone else will take it, or perhaps steal their devices if they leave them). Their food (for instance, snacks and coffee) is spread out over the table, as well as their literature and notes. The photos show how a temporary workplace is set up and inhabited by these student writers throughout one working day. The MTPL method seems to fulfill the condition of capturing different and improvised places and times, as well as activities, and it does so by adding not only a written but also a multimodal view on such occasions. The detail with which these aspects are reported is important, especially when seeing writing as a material, embodied, and dispersed process.

People. One of the conditions set up for the study is the ability of the method to capture the influence of other people on writing, as collaborators, support, company, or disturbance. It is mostly the participant view rendered in the written notations that opens up for studying the importance of other people in writing at specific moments. In the written notations, other people are usually noticeable in different ways. Other people, if important, are also often visible in the working places of those students and hence in the photographs shared by them³ (in some cases also present in the video recordings). The present study focuses on writing assignments that are supposed to be written individually. However, the presence (or absence) of others while writing still seems to be important. While some students go through their process mostly alone, almost avoiding others, other students seem to rely heavily on other people, equally as much for discussing issues related to their writing as for structuring and creating a feeling of control (If he writes, I also write). Students also state that they just want to have some company or someone who keeps an eye on their computer while they take a bathroom break. Daniel is one student who does almost all of his work together with friends, at cafés, in libraries, and (as in Figure 6) in the designated study spaces of

the university. He meets up with the same friends almost every workday, writes, and chats. Others, for instance Ignazio, use the library or sit at home but always write without company (Figure 6). He finds the presence of other people a distraction.

The process logs in the data presented here often contain writers' perceptions of how the presence, or absence, of other people affects the writing process and it therefore seems like an important aspect to address in further research. The use of the MTPL method opens up for studying such issues, relating specifically to the written notations (but also photos) where other people are often described as important in different ways.

Artifacts. Digital devices, such as the computer, are inevitably of vital importance in the writing process. The computer is also most often represented in the process logs of these student writers as the main writing tool. However, most of the student writers also highlight the use of pen and paper for making notes of different kinds. In photos, some students put handwritten notes in a central position or close by the computer (see examples below). For other students, the handwritten notes are less centralized, in photos and logs, but all of the students show and state that they make use of handwritten notes in some way.

O'Hara et al. (2002), who also study places and their material consolidation out of video-recorded material, highlight the importance of the physical proximity and appearance of paper documents, as such documents could encode meaning relevant to the writer's goal. There can be stacks of documents, reports awaiting revisions, complemented ones, and dog-eared pages representing specific locations to attend to. With the MTPL method, such aspects are observable in the photos of the workplace. Even if collected, handwritten notes will not tell as much if they are shown out of context. The meaning potential of these notes, as also argued by O'Hara et al., lies not only in the exact words written on them but also in how they are visually laid out on the table, in relation to other texts (as in Figure 7). The

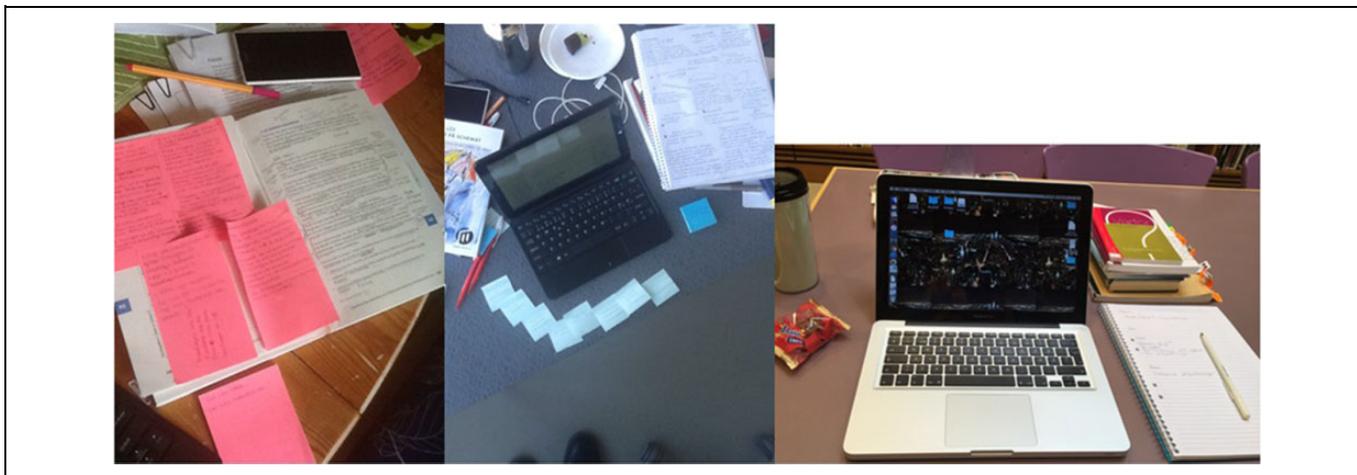


Figure 7. Handwritten notes in working places (Sanna: April 5, March 24; Karolin: April 13).

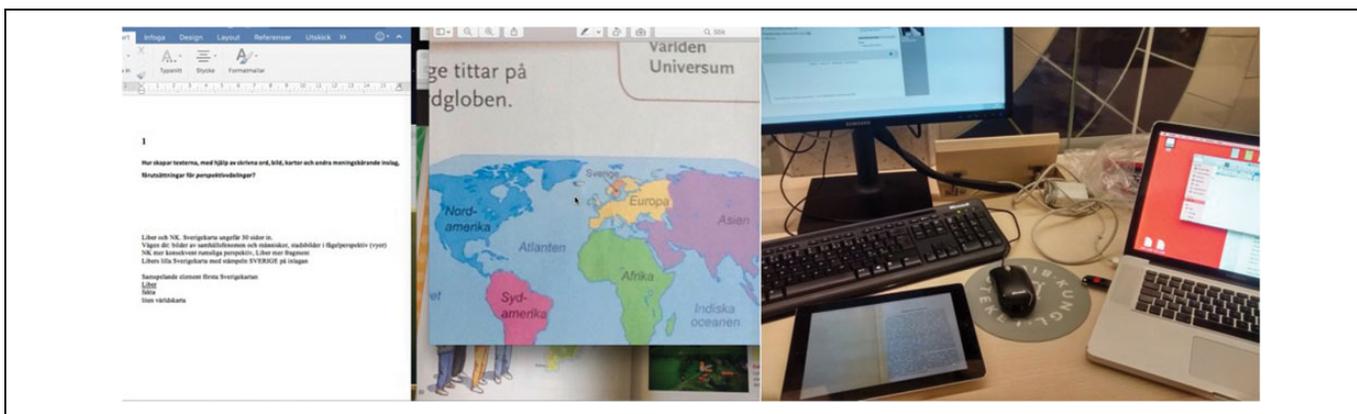


Figure 8. Eli writing with divided screens (April 12), Eli writing with three screens (March 3).

photographs of the workplaces seem here to be of vital importance, if studying how artifacts such as pens and post-it notes in relation to digital devices are connected to a function in the meaning-making process of writing. In the present study, some students seem to be very comfortable using digital environments, divided screens, or a two (or even three) screen setup (see examples below). All of them, however, still use pen and paper writing in some form, which implies some vital function of these handwritten notes, an issue that should be addressed in further research (Figure 8).

The MTPL method seems to open up for new insights into digital as well as material artifact use. The digital artifact use is possible to capture by screen films which provide a deeper picture of how writers make use of such resources. However, such data should be complemented by, for instance, photos of workplaces and resources as well as the participants' own notes. It is not, with a view on writing as an embodied, material, and dispersed process, sufficient to focus only on digital resources, as with keystroke logging programs or screen films. The empirical examples above show how handwritten notes,

for most student writers, play an important part in their writing process, even in a highly digital world. Thus, writing research needs to focus on digital as well as material artifact use. The MTPL method is one way to collect data on both these issues, as it can generate both screen films and notes on digital resource use, and photos and notes on other physical resources that become vital in writing processes.

Discussion

In the following section, the results are summarized and discussed further in relation to the theoretical foundation and earlier methods on writing presented. The theoretical foundation foregrounds material, embodied, and dispersed aspects of writing, grounding the study of writing in new materialism, as well as sociohistorical perspectives (Prior & Shipka, 2003; Rule, 2013). It is thus in relation to these perspectives, which could be developed further in relation to writing research, that the MTPL method is evaluated. This evaluation is presented below.

The Contributions of the MTPL Method

With a view on writing as material, embodied, and dispersed, certain conditions are of importance when collecting and creating data on writing processes. Process research has until recently missed out on material, embodied, and spatial aspects of writing. If such aspects are addressed, the study of them comes with certain methodological challenges. Such challenges are however addressed with the MTPL method. It contributes to the new process research by making it possible to capture the concurrent participants' view on comprehensive writing processes. It thus enables data collection on actual working places and on digital and material artifact use at the actual time of writing. These are, in terms of the theoretical foundation, aspects that are seen as highly important for understanding how writing takes place, and why. The visual representation of workplaces and other things, given in the photographs, complements the written reporting with a multimodal view of the actual writing location or other things or aspects that the writer himself or herself highlights as important. In Rule's study (2013), photos are collected and shown to represent the common writing places. The MTPL method adds a view of these working places that is not common, that is inhabited in different parts of the process, and the data thus highlight how the writing process unfolds in such dispersed places. Further, visual representations are of importance if studying for example the use of material artifacts, such as handwritten notes. These notes are seen to get their meaning potential not only from what is actually written on them but also from their position in relation to other texts and artifacts in the actual writing place and time. Photos of workplaces could capture such unstable meaning potential that would otherwise be lost. It is however of importance that those visual representations are also complemented with the participants' views and explanations which are here given in the process logs. Such accounts are not possible to collect as easily with for instance a camera, as when using the MTPL method. In short, the mobile technologies open up for sharing different multimodal data types, the process logs, as well as photos and films. The process logs as well as the complementing data types are vital to be able to address issues of process consistent with the current theoretical approach.

With the present approach, there is no need to pay particular attention to one mediating tool per se, but rather to the ways in which writers highlight and are shown to use different artifacts as support. This study also shows that the differences between material and digital artifact use present an interesting research question to which researchers should pay more attention. McKee and DeVoss (2007, p. 9) argue that the processes and products of digital writing are often quite different from paper-based ones, mainly because digital technologies shift the ways in which composing takes place. In the empirical examples presented above, handwritten and digital forms of writing are shown to be intermingled and thus not representing clear-cut different processes. However, differences between handwritten and digital writing are of great interest. How and why they

appear, particularly in relation to specific moments throughout the writing process, remains unclear. The use of the MTPL method in research, complemented with collections of digital as well as handwritten texts, and screen films, could address the question of how digital and material artifact use acts in the writing process.

The theoretical view on writing presented here argues for a focus on details and microanalysis; hence, longitudinal studies of writing run the risk of being time-consuming for the researcher. Using the MTPL method, in contrast, establishes a foundation for studying writing processes that are distributed over long periods of time (here represented by a period of 10 weeks), still keeping a detailed view of what matters and acts in such processes. The data produced thus represent rich accounts of writing but are not seen as overwhelming in detail, as keystroke logging could be. In earlier studies, researchers often present case studies of one or two writers only (e.g., Attfield et al., 2009; Leijten et al., 2014; Pigg, 2014; Roozen, 2010). These studies certainly give valuable insights into writing processes, but they are often lacking when it comes to comparisons across cases (made possible by the MTPL method, as it enables following several writers at the same time).

The MTPL method seems to be a viable way to generate data on writing, specifically with a view on this process as material, embodied, and dispersed. Such issues are not easily addressed by the use of earlier methods of writing research. Compared to think aloud protocols, the MTPL method follows a writer in his or her actual writing environment and is not as disturbing in the writing process as the think aloud protocols are. Concerning keystroke logging programs or screen films, where the focus is set on the digital device as the only artifact, the MTPL method instead focuses on all the material and spatial aspects of writing. The data rendered by the method are not as detailed as keystroke logging, but it offers a deep and nuanced picture of the writing process. Interviews represent a method where the researcher gains data on writing processes in retrospect, so details may be left out or not even remembered. The concurrent accounts of writing that the MTPL method generates should be a good way to address such limitations. Further, the use of only process logs (presented by Prior, 2004) does not allow for a multimodal view on writing. Finally, observations and video recordings of writing sessions make it difficult to capture the improvisational writing moments and the details of such moments that are important in terms of the specific theoretical view presented here. Above all, the aspects of writing as a material process, at the same time dispersed throughout physical as well as digital places, are possible to capture by means of the MTPL method as exemplified in the illustrations presented. Further research should address the question of how such aspects matter in prolonged writing processes specifically. Writing as embodied practice may be less centralized in the examples above. However, the notations on and photos of activities and places may possibly account for such issues as well. In combination with video recordings of writing sessions, the data are seen as promising for addressing

embodied practices of writing, a vital focus for the theoretical view presented in this article.

Possible Risks With the MTPL Method

Participating in the study. One main difficulty with this method, as well as others, is to get access to participating writers. As for now, it is often the most skilled writers that choose to participate, or at least writers that have control over their process. It is more difficult to get writers, in this case students, who are at risk of failing their writing to participate. This is a risk with research making use of the MTPL method, but it is also a risk that is apparent in most writing research. Further, the writers in this study are seen not only as participants but also as core-researchers in relation to their own process. This means that participation will possibly change the writing processes, an aspect that is highlighted by the students themselves, and also, in many cases, seen as a pedagogical gain. Students may become better writers, as they reflect on their process. This issue is highly relevant to consider in relation to the theoretical approach. With a new materialism view, the impact of the method itself should not be underestimated. Most students report that participating in the study made them work harder. The students in many ways showed the urge to show off a picture of themselves as “the good student.” However, the study also affected them in other ways. Sally claims that both her writing and her well-being are enhanced by having someone who listens, and someone who responds. The feedback is highlighted as a positive influence by many students. They also emphasize how participating in the study *structures* and *regulates* their time, as reporting is an activity that they do everyday, often at specific times. Their writing is thus formed in relation to these activities. Ignazio states that participating in the study becomes *disciplining*. He also states that “my process is not changed fundamentally, but I became *more aware* of my choices and the reasons for making them.” For research, the fact that the writing process is affected by the research tool might be seen as problematic. This is of course a crucial issue that should be taken into consideration. However, research always involves this risk. In spite of this factor, the data created are seen as a legitimate object of study for research on writing processes.

The ethical concerns. One of the greatest ethical dilemma using the MTPL method is connected to the use of digital devices that are not well documented as research tools. The ethical pitfalls could in the beginning be invisible for the researcher as well as the participants. One such issue could be that the application Evernote tags the locations of the students when they are reporting. The map presented in Figure 3 is one such example. This mapping function offers many possibilities for writing research, but it should be used with caution. As cultural geographers ask for “new maps of writing” (see, e.g., Reynolds, 2004, p. 176), the mobile technologies seem to be a reliable tool for exactly this. However, the location tag surely adds some risks to the project. It can mark out the home addresses of participants, as well as how they are moving between the

locations of their reports. It is of great importance that the students that participate are aware of this fact.

Further, there is a risk involved in the use of digital technologies that save data with different cloud functions. It concerns who will possibly gain access to the material produced. As stated by Sheffield and Kimme Hea (2016), commercial websites and applications own the data, and such data are often used for commercial purposes (p. 5). This is inevitably a problematic issue that is not easy to resolve. With an open dialogue and close contact with students, this aspect should at least be evident for the participants. Further, the main questions asked about writing are not expected to give rise to ethically sensitive data of any kind, but it is not certain that this kind of information is always precluded, as there is a close contact between the participant and the researcher. These ethical issues also vary from one tool to another (for instance, the application used or the use of cloud functions or e-mail) and thus are more or less problematic in relation to what tools that are used. What is certain is that these new digital technologies will be accompanied by uncertainties and the researcher needs to be aware of this.

Conclusion

The MTPL method addresses the conditions that are set up for the study. It enables the researcher to emphasize, most of all, the effect of artifacts and place at detailed and specific moments of writing. It generates subjective representations, such as the concurrent participant view on improvised or planned writing activities, at different places. However, it also generates more neutral representations, like screen films and drafts. The data are highly multimodal and render detailed views on writing activities, thus embracing the particular. To conclude, the MTPL method is seen as a viable data collection method to use, certainly when focusing on the material, embodied, and dispersed aspects of writing highlighted in the present study. Such a view on writing is not yet established in writing research and the questions asked here have not to a great extent been addressed in earlier studies of writing processes. The theoretical view on writing presented in this article, combined with the MTPL method, is seen as an approach that would contribute a great deal to writing process research.

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Notes

1. In a specifically Swedish context, 77% of the population today have access to a smartphone (The Internet Foundation in Sweden, 2015, p. 27). These numbers could be compared with numbers presented by Duggan and Rainie (2012) stating that 85% of American adults own cell phones and use them frequently (cited in Pigg et al., 2014, p. 92). The method risks precluding those who do not

have access to such technologies. However, in Sweden, the development is heading at generic use of such devices, even if the situation may look different in other countries.

2. Represented here by the specific academic assignment and the writing that the writers themselves relate to this process.
3. The people in these photos have agreed to participate in the study.

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