USING STORYTELLING METHODS TO IMPROVE EMOTION, MOTIVATION AND ATTITUDE OF STUDENTS WRITING SCIENTIFIC PAPERS AND THESES

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Abstract

We investigate how storytelling techniques might support students in writing final papers. We suggest a new structure and a new process for student paper production, borrowed from creative writing. We argue that adopting this approach might improve the quality of scientific student papers, increase the satisfaction of writing them and the pleasure of reading them. To test our assumptions we outline the application of the concept to a business informatics graduate course on research methods which accompanies writing a masters thesis. Finally, we position our ideas in the context of contemporary social network-based content creation and massive open online courses.

Keywords*: Storytelling, scientific writing, motivation, research methods, course design.*

1. INTRODUCTION

When students embark on writing a thesis at the end of a Bachelor, Masters or PhD program, they often experience difficulties with regard to the unusal length of the thesis, the expected level or complexity of its structure and the circumstantial isolation or loneliness of the author. The increase in length, level and loneliness is significant in comparison with writing a term paper, putting together a project report or composing a presentation. For majority of my students, this sudden change leads to negative emotions, undermines motivation to proceed and causes attitude issues towards the thesis and the entire process connected with it. The three aspects are similar to the circumstances of a writer composing a work of fiction. It might therefore be interesting to investigate if narrative procedures that have successfully been employed for centuries in fiction and drama might also be useful for the production of scientific writing. These narrative procedures are commonly summed up as "storytelling techniques". They concern both the structure and the process of producing narratives. For qualitative research in particular, Anzul et. al. [1] have highlighted the importance of paying attention to process: "Qualitative research writing is a process, a becoming. [It] requires an almost Zen-like concentration and thoughtfulness. To stay with the process, to stay IN the process is to become a qualitative researcher/writer." Regarding structure, Pollock and Bono [2] stated: "We have two jobs as scholars: Answering interesting questions and telling the story." Successful stories follow a principle of tension that was already described by Aristotle (ca. 335 A.D.) with respect to dramatic construction. The classical IMRAD ("Introduction, Method, Results And Discussion") also leans structurally on this principle. Of course we expect significant differences from the contents of scientific publications, but the requirements of readability, clarity and even excitement through exposition, execution and resolution are the same throughout. This similarity is already used in schools and colleges in order to increase competence before and during writing [3]. There are even courses for research writing based on storytelling techniques [4]. In relation to my supervision of final theses and the co-authorship of scientific publications, I have made the experience that applying elements of storytelling and plot development, for example thematic significance, dramatic action and character development, can have a positive effect on the whole business of publishing. The process and methodological situation is not nearly so clear as the structural: it is generally assumed that methods of successful writing are, equally for all disciplines, strongly dominated by individual differences. Support for the process is either absent or too generic, or it relies too much on theoretical courses to be of much use to the student who is struggling with a thesis. The problem can therefore be stated as follows: students often fail at enjoying writing their thesis; they lack motivation and their attitude is negative. Our objective is to remedy this situation. If, as Zinsser [5] asserts, "writing is an act of ego," then cognitively the investigation of effective scientific writing support becomes an investigation of student writing identity. In this paper we take a rather modest and pragmatic approach: after a short summary of the state of research, we give the layout of an online course to test two hypotheses: the application of storytelling techniques in teaching can increase improvement in ability and output not just (A) in structural (content) terms but also in (B) procedural (process) terms. Hypothesis (A) means that a

scientific paper is structured like a work of fiction, including equivalents of the central fictional devices: plot, character and theme. See Table 1 for a comparison of Whetten's building blocks (called "factors" by him) of theory building with narrative elements [6]: Whetten's factors lead to structural elements of theory building. But they can also be linked to narrative elements. The last column illustrates how a student might be guided by questions to address the structural elements.

TABLE 1: WHETTEN'S FACTORS AND ELEMENTS OF NARRATION			
Whetten factor	**Structure element**	**Narrative element**	**Questions for students**
What	Constructs, Models	Plot line, arc of action	What happens in your paper?
How	Relation-ships, approach	Characters, actors, participants	Who is involved in the research?
Why	Justifica-tions, theme	Thematic significance, message	Why is this interesting?
Who, where, when	Boundary conditions, limitations	Scene setting, backstory	What other results exist?

Hypothesis (B) means that a scientific paper is written as if it was a work of fiction: using the telling of a story as the key to the writing process itself. Fig. 1 shows Noden's fictional plot line [7], an adaptation of Freytag's pyramid [8], which already suggests a time line for such a process. I begin by giving the state of research followed by four different sets of observations on storytelling. Next I present an example scenario to demonstrate how both hypotheses would look like in reality. The example scenario is an online course at the Masters level on the subject of research methods. The course has a virtual classroom component that runs parallel to the preparation of the Masters thesis and is designed to support the thesis writing process.

2. STATE OF THE ART

Storytelling as a tool to facilitate and improve writing is well researched in the Anglo-Saxon linguistic sphere, most notably in the area of school education. Some emphasize

increasing the effectiveness of writing by improving style and composition [9], while others focus on the necessity of paying attention to oral storytelling traditions [10]. Storytelling has long been familiar as a method of social science research [1], and within this context is also promoted and accepted as a legitimizing quality: e.g. Koch [11] showed "that if the research product is well sign-posted, the readers will be able to travel easily through the worlds of the participants and makers of the story and decide for themselves whether the story is a legitimate research endeavour." In 2013, Pollock and Bono wrote an editorial in which they highlighted and explained narrative elements of storytelling for scholarly writers [2]. Their sources are exclusively from the nonfiction or creative writing self-help literature, suggesting an absence of studies in the field. Publications on scientific research for beginners (suitable for students) are mostly dry material, written in very minimal style — presumably because the actual spectrum of scientific writing is vast and the authors may feel it is impossible to do justice to the whole field by giving examples. Recker [12] is an example of this style — if only in a subfield (scientific research information systems).

Using storytelling to organize temporal flow (my hypothesis B), to coach students and supervise their thesis contents and to design research methods courses (see Fig. 3 below) is new.

3. PREPARATIONS

The sample scenario discussed below comes out of four different sets of experiences with storytelling techniques, which illustrate the argument and the hypotheses

3.1 Own fiction writing

To begin with, in the context of my activities as a fiction writer [13], I have used storytelling techniques for a number of years, especially plot lines, character development, themes and techniques for creating suspense. These experiences have informed my nonfiction writing, both for scientific publications and for other fact-based writing. One effect of this cross-pollination was a heightened awareness of the three narrative elements of storytelling which were identified and discussed by Pollock and Bono [2]: the human face, motion and pacing, and titles. The same goes for the process of crafting a story — from first draft through getting feedback to publication. Pollock and Bono [2] only deal with the early stages of this process. The reason is partly that, even in the view of most fiction writers, the roads towards successful publication are highly divergent the further the writing process goes on.

FIGURE 1: PLOT LINE ACCORDING TO NODEN [7]
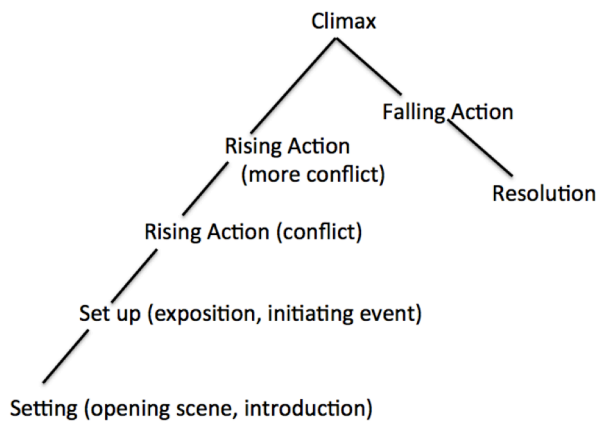
3.2 Blogging as term papers

I have experience with blog writing as student course work since 2010. In 2013, I began to require students to write their term papers in the form of weekly blog entries following the IMRAD structure and spread out over the whole term: to do this, the students were given a schedule. E.g. they had to write the introduction in one week, the section on the state of the research in the next, and on methodology in the third week. Since the students were only in their second semester and therefore mostly lacked information about what it even meant to write scientifically, I illustrated what I meant by blocking alongside them and writing a paper in parallel. Also, the students receive formative feedback on their contributions throughout the term. After completing their paper, I write a detailed evaluation and offer to discuss it with them. The details of this quasi-experiment are the subject of a future publication [14]. Fig. 2 shows the course structure across the entire term (from left to right) with the final term paper at the end.

## 3.3 Supervising theses using Moodle

I use a Moodle course to support my current students during their (Bachelor and Masters) thesis writing. Moodle is a learning-management system used by many schools and universities (including the Berlin School of Economics and Law) — see e.g. [15]. This course contains mostly information and materials, like anonymized dissertations, evaluations, helpful links etc. It also provides a forum where the students perform intervision by helping each other. Since summer 2013 I have asked the students to write weekly learning diaries

in blog format as well. Their diary entries are also commented on by me (at irregular intervals), providing formative feedback. This supervision method is very well received by the students and lends further support to hypotheses (B).

3.4 Supervising term papers using Wikis

Over the period of two terms, I experimented with supporting different courses at both the Masters and at the Bachelor level using a Wiki as a well established platform and Wikiversity (Mediawiki software) as a well established provider of so-called Open Educational Resources [16]. We found that real-time course support via Wikis in connection with agile management methods can overcome drawbacks of existing closed learning management systems (such as Moodle in sect. 2.3). The detailed results [17] showed that agile process management (in this case using a simplified Scrum methodology) improves team term papers. Though this work targeted students operating and writing in small teams rather than as individuals, the results support hypothesis (B) in so far as the typical fiction writing process is also highly agile in a technical sense: more flexible, more dialogue-oriented, focused on prototype-improvement and sprint completion.

FIGURE 2: USING BLOGS TO WRITE TERM PAPERS [14]
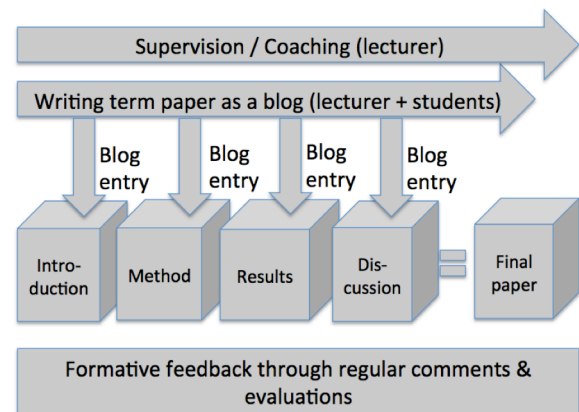
4. THE RESEARCH METHODS COURSE

I briefly describe the course design and the course content and learning objectives, provide a SWOT analysis and identify the methodology used during the course to test my hypotheses.

4.1 Course design

To test the hypotheses (A) and (B) about the application of structural and procedural storytelling techniques to student writing, I'm designing a blended learning course on "Research Methods" for a new Masters program in business informatics at the Berlin School of Economics and Law. This course will first be given in winter 2015. The focus of the Masters program is on big data and business intelligence. Typically, the students in other Masters programs at the school take this course while working on their Masters thesis. In our experience this is too late because some students will now face increased demands of scientific rigor for the first time. Therefore the course will consist of two parts: the first part is an online module which can be taken independently of the class at any point during the Masters program. The second part will be conducted online in weekly sessions using one of the school's virtual teaching environments, for example Adobe Connect (2D), or Second Life (3D) or LibertasU (3D). As a blended learning application, the course will resemble an xMOOC (Massive Online Open Course, or MOOC, used to transfer content from an institution of higher learning to the general public). According to the typology of Gauthier and Colin cited by Rosselle [18], this includes functions to facilitate and measure: problem solving; improvement and progress; practice and project work; training and assessment; facilitation of discussions and (online) support; tutoring and coaching; presentations and demonstrations (including audio and video interviews with researchers in the field); discovery and research through gamification. The possibility of expanding the course as an xMOOC will be investigated peripherally. If successful, the pilot course will be extended from one to the other masters programs of the school.

4.2 Learning objectives and content

The basic assumption of this course is that researching, writing, editing and reading of scientific papers should be fun and the culmination of everything absorbed and learned during the Masters program. The aim of this course is to give students the tools necessary to successfully complete their thesis, share successes and failures of the whole process with other students and lecturers, and learn to appreciate scientific writing. After completion of the course, students will be able to identify appropriate research questions and use scientific research methods to answer them; know how to write and edit a research thesis that is as interesting to read as good fiction or nonfiction; have learned a variety of research methods and approaches from seminal texts and real researchers.

The course will deliver the basic knowledge that can be expected from a course on research methodology at Masters level: principles of scientific inquiry, research process, theory building, quantitative and qualitative research methods, publishing research and ethical considerations. Differences regarding process (hypothesis B): the students will be instructed to complete the different sections of their thesis according to a fiction writing schedule. This means, for example, taking the distinction between first draft and following drafts and the editing phases in between seriously; focusing on the creation of prototypes (as in agile software development); frequent dialogue and communication with the supervisor (continuous feedback). Differences regarding content (hypothesis A): through questions and coaching, but also through examples, students are guided to identify narrative elements in the back story to their research in their research treatment and in the post-writing phase. This means, for example, to think of the different actors that have a role in the research — from the author himself to interview partners or other persons; to identify the plot of one's own research – what (if anything) will cause the reader to engage with the message and the unfolding of the research?

Fig. 3 illustrates how key learning points of the course on the time line (left hand side) correspond to the classical plot line (on the right hand side). Each key learning point of the course is reflected, as it is acquired, in the thesis structure and the content.

4.3 SWOT analysis of the course

To get an overview of upsides and downsides of the proposed design, we performed a SWOT analysis (See Table 2 for a summary of the key points):

Strengths: online delivery provides flexibility with regard to time and pacing; coaching by the supervisor and mutual coaching in a community of candidates offsets the isolation that comes with the online situation. The focus on storytelling increases in the interest of both of the author in his text and his delivery, and of the readers — both for drafting/editing purposes and for final. Embedding thesis creation in an agile process focuses the author on the reader (with whom he is ideally in constant dialogue) and helps him manage his time.

Weaknesses: the mix of methods could be confusing to the students which would have a demotivating effect. That is currently, because of the novelty of the approach, a lack of good examples of scientific papers that implicitly or explicitly use storytelling methods or whose authors reported using storytelling processes. There is (an analogue to agile methods like scrum) the danger of depending too much on the supervisor (a mixture between the scrum master and the product owner).

Opportunities: the course design in the entire idea of focusing more on the well-known difficulties of students writing scientific papers improves a well-known issue of academic training and research-based learning. Traditionally, there is more emphasis on consumption of scientific results than on the creation. The course attempts to address this imbalance. The concept may well be scalable and lend itself to an extension as a xMOOC course with a much larger audience than for the pilot course. This is more likely also because evaluation is most formative (content-based feedback) than summative (grades).

Threats: the course threatens to disrupt the routines of both students and supervisors; this is a well-known potential consequence of all real change situations. The disruption may also be felt as enriching. There may be a lack of acceptance in the scientific community both for the new process and for the new structure. Papers written in the way suggested here will read differently, perhaps be more interesting or entertaining even to a larger audience: this may contradict common (implicit) practices and goals. Lastly, the course may propose to many changes at once. It may be necessary, in later iterations of the pilot, to reduce the goals and at least in

FIGURE 3: LEARNING REFLECTED IN THESIS STRUCTURE
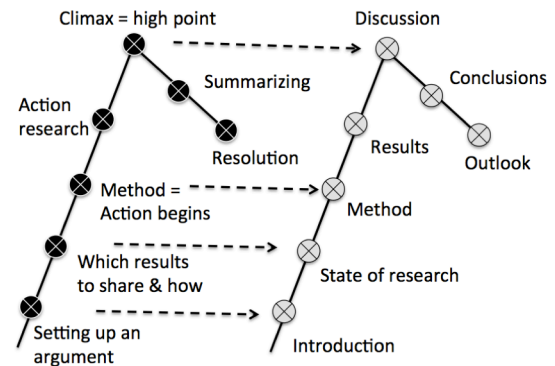
4.4 Evaluation

To evaluate the effects of the course design on student performance and to validate my hypotheses, I will use phenomenological qualitative research methods in the participant-observer mode. The course itself is a quasi-experiment, a form of experiment that we have already tested and described in a previous set up [14]. Participant-observer mode means that I will be an actor in the experiment as lecturer, supervisor and coach while taking data. Course participants will be questioned using structured interviews which will be transcribed and evaluated. Students will themselves participate in the data taking and the data evaluation (as part of their research work at Bachelor level). Since I do not have a reference group, the results will provide at best a proof of concept and a basis for further research.

TABLE 2: SWOT (POTENTIAL STRENGTHS, WEAKNESSES, OPPORTUNITIES AND THREATS) ANALYSIS OF THE COURSE DESIGN	
Strengths	**Weaknesses**
• Flexible online delivery and coaching • Focus on storytelling (interest, entertainment) • Agile process (reader-focused, time managed)	• Methodical mix confusing to students • Lack of good examples • Increased dependency on supervisor
Opportunities	**Threats**
• Improving well-known issues (motivation, attitude) • Scalable concept (xMOOC approach) • Increase of quality and time management	• Cause of disruption of routines • Lack of acceptance in scientific community • Too many changes at once

parts return to tried and tested traditional practices.

5. CONCLUSIONS

I argued that the incorporation of storytelling techniques used successfully in fiction writing might also be useful to support students writing scientific term papers or theses in order to support good feelings, motivation and a positive attitude in the course of the whole writing process. Regarding this incorporation of storytelling techniques I suggested such an incorporation both in terms of content or structure (hypothesis A) and in terms of process or procedure (hypothesis B). I could not find a systematic investigation of this approach in the literature. In order to test my hypotheses, I proposed to establish a pilot course which was described in some detail. Using a SWOT analysis, I also addressed certain limitations of the course.

It is possible to place this approach within the body of knowledge known as computer supported human information processing. By relying on online learning techniques, we introduce an additional dependency on computers, which is not (yet) typical in the world of fiction writing from which we borrowed the methods. The next step in this investigation will be an evaluation of applying the methods to a real course as outlined here.

Acknowledgements

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