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The impact of writing technology on conceptual alignment in BA thesis supervision

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Seamless Learning – lebenslanges, durchgängiges Lernen ermöglichen

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Inhalt

Claude Müller und Jennifer Erlemann
Seamless Learning – lebenslanges, durchgängiges Lernen ermöglichen 9

Langbeiträge

Anne-Cathrin Vonarx, Katja Buntins, Michael Kerres, Joachim Stöter, Olaf Zawacki-Richter und Svenja Bedenlier, Melissa Bond
Student Engagement und digitales Lernen
Kontextuelle Validierung eines Systematic Review
mit E-Learning-Akteuren an Hochschulen 15

Bonny Brandenburger and Gergana Vladova
Technology-enhanced learning in Higher Education
Insights from a qualitative study on university-integrated
makerspaces in six European countries 27

Clarissa Braun, Lothar Fickert, Sandra Schön und Martin Ebner
Der Online-Kurs als Vorkurs einer Lehrveranstaltung
Umsetzung und Evaluation des Pre-MOOC-Konzepts
in einem technischen Studiegang 39

Gregor Damnik, Sindy Riebeck, Fritz Hoffmann, Christin Nenner und Nadine Bergner
Lehren und Lernen in der digitalen Welt – ein Lernangebot für
zukünftige Lehrkräfte im Blended-Learning-Format 49

Jonathan Dyrna, Maximilian Liebscher, Helge Fischer und Marius Brade
Implementierung von VR-basierten Lernumgebungen – Theoretischer
Bezugsrahmen und praktische Anwendung 59

Ulf-Daniel Ehlers und Patricia Bonaudo
Lehren mit offenen Bildungsressourcen
Kompetenzrahmen für „open educators“ 69

Michael Eichhorn, Alexander Tillmann, Ralph Müller und Angela Rizzo
Unterrichten in Zeiten von Corona
Praxistheoretische Untersuchung des Lehrhandelns
während der Schulschließung 81

Gerald Geier, Sandra Schön, Martin Ebner und Clarissa Braun
Der Ansatz von Citizen Science bei der Erstellung
von Lehr- und Lernmaterialien in einem Hochschulprojekt 91

Matthias Haack und Thomas N. Jambor
Seamless Learning im problembasierten Flipped Classroom mit einem Remote Lab 101

Barbara Meissner, Felix Streitferdt und Andreas Pazureck
Inverted Classroom in der Studieneingangsphase – individualisiertes Lernen als Hilfe beim Einstieg ins Studium 111

Christian Schachtner
Educating Sustainable Development (ESD) in the Context of Public Management
Conceptual Considerations for the Design of a Collaborative Educational Format for Local Sustainability 121

Ariane S. Willems, Angelika Thielsch und Katharina Dreiling
Mit *Seamless Learning* den Brüchen zwischen Studium und beruflicher Praxis begegnen
Ein *Flipped-Classroom-Beispiel* aus der Lehrerbildung. 133

Kurzbeiträge

Svenja Bedenlier und Claudia Schmidt
Digitalisierung hochschulischer Lehre und der *third space:*
Hochschulprofessionelle als WegbereiterInnen für *seamless learning?* 145

Clément Compaoré
Entwicklung eines Blended-Learning-Konzepts für den Sprachunterricht an der Volkshochschule München im coronabedingten Notbetrieb 151

Gregor Damnik, Sindy Riebeck, Fritz Hoffmann, Christin Nenner und Nadine Bergner
Lehramtsstudierende mit Mikrofortbildungen aktiv auf den Beruf vorbereiten 159

Luci Gommers
Seamless learning through students' eyes
A qualitative case study on students' perception of seams in cross-contextual learning 165

Kai Matuszkiewicz und Franziska Weidle
Neue Welten erkunden
Die (hochschul-)didaktischen Potenziale der Welthaftigkeit virtueller Medienumgebungen 171

Claude Müller, Christian Rapp, Jennifer Erlemann, Jakob Ott, Andrea Reichmuth und Daniel Steingruber
myScripting – Entwicklung eines digitalen Educational-Design-Assistenten 177

Christian Rapp, Otto Kruse and Ueli Schlatter
The impact of writing technology on conceptual alignment in BA thesis supervision 183

Marie Troike und Elise Schwarz
Im virtuellen 360°-Labor experimentieren – Ein didaktisch aufbereitetes Lernszenario in fünf Akten 191

Roger Seiler und Stefan Koruna
Kurzbeitrag Mixed Reality (MR) in der Lehre: Eine Übersicht mit Exkurs zu ersten Anwendungen in der Wirtschaftsinformatik 197

Poster

Aline Bergert
„Digitalisierung? Machen wir schon ewig." Eine rekonstruktive Studie zu Orientierungsmustern Lehrender im Umgang mit digitalen Medien im Hochschulalltag 207

Ralf-Dieter Schimkat, Rainer Mueller, Simon Huff, Tobias Keh, Michael Lang, Georg Mohr und Marco Trippel
Praxisrelevantes, agiles Lehren an Hochschulen mit integrativer Einbindung von Unternehmen 213
Nahtloser Übergang in Lehrveranstaltungen zwischen Hochschulen und Unternehmen 213

Andreas Engel und Elise Schwarz
Die Campus-App als persönliche Lernumgebung 217

Workshops, Demos und Tutorials

Ellen Rusman, Christian Papp, Bernadette Dilger and Luci Gommers
Workshop "Seamless learning ecosystem": past, present and future relevance for research and practice in tailored lifelong learning 221

Claudia Börner, Anna Seidel, Franziska Weidle, Marlen Dubrau, Thomas Müller, Lukas Flagmeier und Matthias Tylkowski
Projekt Learn&Play: Personalisierung und Adaptivität in einem Serious Game 225

Simon Huff, Tobias Keh, Michael Lang, Georg Mohr, Marco Trippel, Rainer Mueller und Ralf Schimkat
Seamless-Learning-Plattform
Digitale Unterstützung der Lehrenden bei der Konzipierung, Entwicklung, Erstellung von und der Suche nach Lehr-/Lernkonzepten 231

Christian Rapp and Otto Kruse
Thesis Writer 2.0 – a system supporting academic writing,
its instruction and supervision 235

Marie Troike und Andreas Brandt
Digitales Peer-Feedback zur Schärfung wissenschaftlicher
Genauigkeit in verschiedenen Fachdisziplinen 241

Autorinnen und Autoren 245

Veranstalter und wissenschaftliche Leitung 261

Steering Committee 261

Gutachterinnen und Gutachter 261

Gesellschaft für Medien in der Wissenschaft (GMW e.V.) 262

Christian Rapp, Otto Kruse and Ueli Schlatter

The impact of writing technology on conceptual alignment in BA thesis supervision

Abstract

A thesis is the capstone writing experience of almost all degree programmes. With the Bologna reform, a BA thesis is required already after three years of study, often leaving students inadequately prepared. In contrast to PhD thesis supervision, BA thesis supervision has attracted limited scholarly attention to date. Advances in computational linguistics and informatics in recent years have led to the rapid development of systems that support various types of writing as well as numerous sub-processes. Using conceptual alignment as a framework, this study reports the preliminary results of a larger research project on (a) how students and supervisors at the BA level reach agreement regarding a thesis proposal concept, and (b) the impact of new technology on this process.

1. Related work, practice of BA thesis supervision

Digital writing technologies have significantly changed literacy and literacy education, leading to new writing practices, digital genres, and instructional approaches (e.g., Alexander & Rhodes, 2018; Inglis et al., 2002; Mahlow & Dale, 2014). In this paper, we report the initial results of a project that aims to test and explore new ways of studying thesis writing and supervision processes in higher education using a newly constructed digital tool to support thesis writing called Thesis Writer (TW) (Kruse & Rapp, 2018; Rapp & Kauf, 2018).

The capstone writing experience of almost every degree programme is a thesis, which is used to assess the ability of research-based collection and processing of data or other materials, and to structure this material according to one of the available process-genres (Swales, 1990). However, with the Bologna reform, the amount of time granted to students to develop thesis writing skills was reduced to three years, leading to significant problems rooted in a lack of practice and insufficiently developed writing skills (Samac et al., 2009). While, to date, considerable research effort has been devoted to doctoral dissertations (Berman & Smyth, 2015; Dysthe et al., 2006; Kamler & Thomson, 2006; Maxwell & Smyth, 2011; Vehviläinen, 2009; Vehviläinen & Löfström, 2016), only recently has undergraduate thesis supervision research begun (Roberts & Seaman, 2018; Stappenbelt & Basu, 2019).

Among the different skills that writers need for thesis writing, this study focuses on one in particular: the conceptualisation of a thesis idea. For thesis writing, not only does the conceptual thinking of students matter, but also the negotiations with their supervisors, in order to align their thesis concepts (Stappenbelt & Basu, 2019; Svinhufvud & Vehviläinen, 2013). The term 'conceptual alignment' we use to study this

aspect has been developed in communication theory (Schober, 2005) to explain how partners in dialogic situations arrive at a shared understanding of the matter under discussion.

Advances in computational linguistics and informatics in recent years have led to the rapid development of systems that support various kinds of writing and facilitate various sub-processes (Allen et al., 2015; Strobl et al., 2019; Williams & Beam, 2019). Such tools, among other support measures, foster conceptual understanding, which may also be used to introduce conceptual alignment. TW provides a template with commentary (a proposal wizard) to help support the development of a thesis structure based on an extended version of the well-established IMRaD structure (Introduction, Methods, Results, and Discussion – Swales, 1990). It also helps writers to become acquainted with this structure when creating their first thesis proposal. Figure 1 displays the main working space of TW: The document structure can be created in the left plane, while the text is produced in the centre plane which is subdivided into separate fields corresponding to the document structure. Various support functions can be accessed via the right plane or by the context menu: Tutorials, comment function, an index card system, and a basic reference management tool. Formulation processes are supported in German and English by phrasebooks and search engines which allow for real-time searches in two attached corpora with over 20.000 documents each.

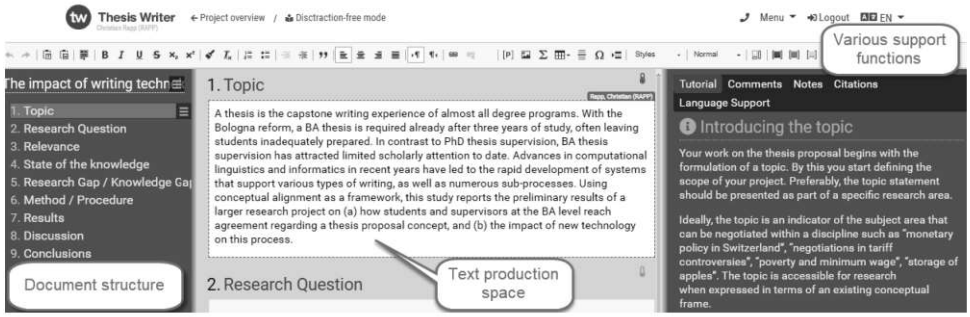

Figure 1: Main working space of Thesis Writer

The present study examines Bachelor Thesis (BT) writing within the "Business Administration" Bachelor Degree Programme at a Swiss University of Applied Sciences. In the programme, students have 14 weeks to write their BT. The BT, a research-based paper grounded on scientific principles, is an individual piece of work on a topic that is either scientific or professional in nature. Supervisors are senior lecturers or research associates. They have a consulting role as supervisors and are not permitted to contribute towards a student's findings or results, nor correct or revise any part of the thesis. Once the BT is completed, the supervisor grades it. The equivalent of 20 hours of work is credited to each supervisor for this consultation and grading.

The BT supervision process entails the following. A preliminary meeting is held to specify the topic and discuss the research question(s). At the first interim meeting, approximately 4 weeks into the period reserved for writing the BT, the student must submit a BT proposal ("disposition") which outlines the research question as well as

the goals and the structure of the BT. The proposal must be evaluated by the supervisor and will either be accepted or rejected. Actual work on the BT can only begin after acceptance. A second interim meeting is held two-thirds into the time period to review the student's progress and discuss any final changes that may be necessary. Further interim meetings may be scheduled, if required.

2. Goals and methodology

The aim of this study was to explore how conceptual alignment takes place when TW is introduced as a writing tool. The collaboration feature in TW allows the supervisor to read what the student has written within the tool, and this can be used for written or oral feedback. Here, we report on data from a pre-study (observation of 3 BA thesis kickoff meetings and a focus group with 4 supervisors) of the larger project (full project see fig. 2).

Research questions: (a) How do students and supervisors come to an agreement on the thesis proposal concept? (b) What is the impact of the new technology on this process?

Study design: Given the early stage of knowledge in the field, we follow a multistage mixed-methods design (Creswell & Plano Clark, 2011) (Figure 2). This provides both quantitative and qualitative data which can be used to explore the processes as well as test some of the relationships identified in the literature in terms of undergraduate thesis supervision and respective tool development.

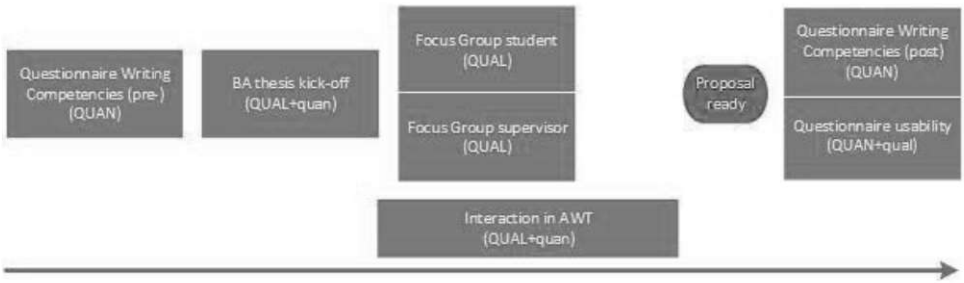

Figure 2: Sequence of data collection

Sampling: In the pre-study reported here, we used a convenience sample of supervisors from the Institute of Business Information Technology. Four supervisors (2 males, 2 females; all senior lecturers or research associates with 6 to 9 years' experience in supervising on average between 2 to 4 BT per year) agreed to participate. They are currently supervising 11 students utilizing TW. Consent was obtained.

Data collection: One of the authors participated in three **BT kickoff meetings** in February 2020, and observed that TW was used in three different ways – (1) the student developed a proposal in TW before the meeting and it was discussed during the meeting, (2) the student and the supervisor used the proposal wizard during

the kickoff jointly and subsequently the proposal editor to develop a thesis concept, (3) both used the proposal editor jointly without prior use of the wizard. Audio recordings were made and fieldnotes taken. During the meeting, the researcher observed but did not interact. After the meeting, the supervisor was questioned by the researcher. A **focus group interview** with supervisors was then conducted in April 2020. An interview guide was developed to ask participants about their general experience in supervising BTs, central problems they encounter within the process, the usage of TW in the process, their experience using TW, and their estimation of students' attitudes towards TW in supporting thesis supervision.

Data analysis: Data from the observation of the BT kickoff meetings (fieldnotes, partial transcription, questions) were inductively coded for emerging themes with no initial coding framework (Schreier, 2012). Focus group data were recorded, partially transcribed, and analyzed inductively (Gibbs, 2015; Krueger & Casey, 2015). Questions from the interview guide were used as an initial coding scheme (Saldaña, 2016).

3. Results

BT kickoff meeting: Alignment was a central topic during the three meetings with one of the supervisors. The supervisor had offered several related BT topics with the aim of establishing a new research field. Some students were working part-time with the thesis being a project related to their work. Consequently, the interests of the supervisor, the student, and the employer had to be mediated. This negotiation was most noticeable when the sections "topic" and "research question" were discussed. The use of the tool revealed a potential point of conflict with respect to the degree to which the thesis is applied or basic research. TW supports research-based thesis structures (IMRaD scheme). In cases where students proposed to study a topic related to their jobs, they preferred a more hands-on applied research approach (problem solving) with the genre characteristics of expertise, while the supervisor had a more rigorous research methodology in mind.

The discussion showed that the usage of TW structured the interaction between students and supervisors in three ways. Firstly, this occurred spatially, as a large screen was used for displaying the tool. While sitting opposite each other, the student and supervisor mostly looked at the screen where the produced text was displayed. The resulting interaction was less face-to-face as it was mediated by the screen. Secondly, the sections provided in TW (e.g., topic, research question, relevance) structured the meeting chronologically. Thirdly, the sections in TW structured the content to be discussed even if the tutorials given in TW for each section (e.g., explaining what "state of the art" means and how can it be developed) were not read. This, however, led to a discrepancy between student and supervisor as to what is expected in each section, with interpretations often differing from those the tool designers had anticipated.

As described above, TW was used in three different ways. In the case where the student had made the proposal at home using TW, discussion took longer in comparison to the two cases were the proposal was developed during the meeting. Discrepan-

cies appeared smaller in the other cases where the proposal wizard was filled in jointly (displaying section after section) and then the editor (displaying all parts of the proposal at the same time) or when only the editor was used. In these cases, negotiations went more smoothly and took less time, arriving at lasting formulations about content more quickly. Obviously, the need for substantial scaffolding is stronger than the benefit of independent conceptualizing of the thesis idea. In the case where the proposal was already developed by the student before the meeting, disagreement during the negotiation seemed more difficult to resolve possibly because existing text had to be changed rather than new text jointly created.

Focus group interview: A first important finding was that in almost all cases, supervisors proposed the topic rather than the students. Most of the supervisors chose topics that relate to their own work or research, and expected to benefit from the results therefore, willing to invest more than the 20 hours granted. Supervisors reported that they give students considerable freedom to develop the actual research question out of the proposed topic. Supervisors described their role as that of a coach and the actual negotiation on the topic as a ping-pong phase. Most supervisors see themselves as encouraging students to play a significant role in shaping the research question ("ownership") and legitimate this with the need to secure the students' motivation for carrying out the research that follows. They also felt it was a valuable step towards becoming an independent researcher.

The impact of technology on coming to an agreement on the thesis proposal between student and supervisor was seen differently. Surprisingly, supervisors expressed that technology should initially play *no* role fostering that students would approach the topic openly to allow for surprising ideas and approaches. The dominant practice was that supervisors asked students to develop the proposal within TW as the basis for either face-to-face discussion or commenting. One supervisor used TW in a meeting to jointly complete the proposal text seen on a screen. In this case, the student was the one doing the writing, which gave the supervisor a clear impression of whether a mutual understanding was reached.

Surprisingly, the comment function in TW was nearly unused by supervisors. This was justified as so far no notifications can be sent out of TW asking for feedback by students and no function for storage of comments implemented in result supervisors could not prove what feedback they gave. By far, the impact mentioned most often was the structure provided by TW (i.e., the extended IMRaD scheme) that led to a shared understanding of the research process, its steps and the relationships between them. Additionally, it supported an iterative process between the supervisor and the student when jointly shaping the research proposal. Finally, the positive effects of TW's instructional content was noted, as provided by tutorials for the sections of the proposal and by an integrated phrasebook that supports the formulation process. Still, supervisors reported that TW as a tool cannot substitute the experience of the supervisor in his/her field and as a researcher. Both play a crucial role in coaching the student in the proposal phase leading to a viable plan for the subsequent research project.

4. Discussion

Agreement on the proposal is a key issue in BA thesis supervision. In most cases, BA supervisors, in line with findings from PhD supervision research (Stappenbelt & Basu, 2019), proposed topics that added to their own research fields. However, when developing the actual research question, supervision was perceived more as coaching than instruction. Students were mainly encouraged to shape the research question according to their interests. TW appeared to intervene in that process at different levels. In particular, the structure (based on an extended IMRaD scheme) provided common ground for shaping, discussing and planning the intended research among students and supervisors. Tutorials and support for academic formulation assisted students in their proposal development. TW was found to support both synchronous and asynchronous collaboration in proposal supervision. A novel insight was the potential of TW to ensure mutual understanding when jointly used during a meeting. Surprisingly, collaboration within the tool rarely occurred due to missing notification function and requirements regarding documentation. While supervisors mainly highlighted the strengths of the tool, they also mentioned some open issues when using TW. They were clear in their attitude that TW provides valuable support, but is no substitute for their roles as researchers and supervisors.

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