Chapter #10

COLLABORATIVE LEARNING ENVIRONMENTS
Learning with Tiny Articles as a participatory learning network

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ABSTRACT
Over the past years, the nature of teaching has fundamentally changed. The learning process is challenged by a more uncertain and complex world. First grade students face a difficult starting point. Confidence in one's own learning process, between learners and teachers, and the strengthening of one's own peer group need to be intensively promoted. In order to develop critical thinking as individuals in a heterogeneous community and to make fears and uncertainties accessible to a scientific discourse, a new teaching concept for bachelor students in Human Sciences was designed. To encourage collaboration and interdisciplinary thinking, a novel format of simplified peer-reviewed publications was developed, called Tiny Articles. Inspired from the research cycle, we implemented different phases of critical thinking, reflections and writing episodes. This created eventually a virtual "common brain". This accumulation of knowledge, ideas, and reflections was shared with lecturers and opened up discussions about learning difficulties or problems. Learning with Tiny Articles is presented as a successful way of networked learning and working in mixed teams.

Keywords: tiny articles, collaborative learning, common brain, shared reflections, learning dynamics, practical inquiry model.

1. INTRODUCTION

In winter semester 2021/2022, we started the new (or revised) study programs Bachelor of Arts Education, Bachelor of Science Psychology and Bachelor of Science Sport Science. During the conception phase, the department took new paths of cooperation by basing the curriculum of all three study programs on common interdisciplinary modules, which were profiled from a human sciences perspective. Thematic reference points are the human being as subject and object of human scientific research and the strengthening of the acting actors within scientific work and research.

The basic module "Learning and Working Strategies" for first grade students is accompanied by tutorial teaching in order to intensively support the transition and to create the prerequisites for independent study. Already experienced students, who are especially qualified and accompanied, establish a link between the beginning of studies and the subject discipline. Fears and uncertainties could also be addressed at eye level in a protected space and worked on in the form of dialogical feedback processes.

The organizational team designed a new module for a heterogeneous learning group that, due to the pandemic, would meet the needs of the students and at the same time provide a space of approaches and assumptions in order to stimulate a discussion. In face of the experience of social distancing, learning became also a retreat into solitude. This development motivated us to develop a concept that focuses on learning in community.

The content of the module focuses on scientific and epistemological principles, learning strategies in the course of studies and basic steps of human science research processes. These can be experienced by means of ongoing research activities at the participating institutes (psychology, sports science, pedagogy). In addition to the acquisition of professional competencies, the students' personal development was of particular importance for us. We promoted competencies such as interdisciplinary teamwork, the ability to form critical feedback and the reflection of knowledge potentials.

The module consists of two course formats and provides blended learning spaces in which teachers and students can interact dynamically. The impulse lectures are reflected continuously by the students in form of short texts (weekly Tiny Articles) with a predefined formatter (see chapter 3 Methods). These initial (pre-)scientific reflections are shared with other peers in a protected setting in the weekly tutorials. Here the Tiny Articles were read and feedback was provided by other students to create a peer-review process. With this approach, core elements of the scientific publication process based on established research methods were learned and practiced in an educational setting.

The use of digital media in a simulated open access process creates a dialogue-oriented participatory learning space whose core intention is a "review for research" rather than a "review of research" (Reimann, Sippel, & Spannagel, 2010, p. 224) in order to provide intensive learning opportunities. The recurrent writing and revision processes culminate in the search and justification process of a subjectively significant research question. This is always reflected, especially in the impulses of the lecture, with the meta-perspective on science, its potentials and also ethical limits. Following Huber (2004), this emphasizes the importance of cognitive, emotional, and social experience for the principle of inquiry learning. This comprises the initial interest, the questions and structuring tasks of the beginning, through the ups and downs of the process, feelings of happiness and uncertainty, to the insight or problem solution that is (co-)found by oneself (Huber, 2004, p. 33). We follow this teaching approach in our work by integrating the different perspectives of the learning process into the design of our course.

2. BACKGROUND

The Practical Inquiry Model by Garrison, Anderson, and Archer (2001), based upon the work of John Dewey, frames critical thinking as an autonomous, but collaborative, constructivist learning and problem-solving process in which the individual acquires knowledge or generates new knowledge together with the community (Jahn, 2019, p. 35). Their process model of a digital educational experience has been an inspiration for our learning concept with Tiny Articles.

In the Practical Inquiry Model, the scholarly research process occurs in four phases that alternate between the two spheres: a private and a shared world (Garrison et al., 2001, p. 9). The private world is accessible only to the learner. The shared world becomes a place of encounter and exchange. Following Jahn (2019, p. 35) we assume that profound experiences need both places to set cognitive processes in motion The private world, with the help of recurring written reflections, provides a shared framework for recording one's own ideas, impulses, questions, and irritations and making them accessible to the other peers shared world. These first (pre-)scientific texts were the content reference point for the tutorial and were mutually reflected and commented on there with the help of practicing a scientific peer review process. The feedback generated there formed the basis for the revision and finalization of the weekly Tiny Articles in the private world. Gradually, collaboratively written Tiny Articles emerged, which were taken up and discussed in the lecture and thus

became part of the shared world. The approach deliberately accepts that initial reflections can be found in pre-scientific formats, and explicitly does not exclude oneself as a participant. Inspired by the phases of the Practical Inquiry Model (Swan, Garrison, & Richardson, 2009, pp. 46-47), the following stages can be identified in the concept of learning with Tiny Articles (Figure 1). Thus, at the beginning, the thesis was that the start of studies must be understood as a triggering irritation, which can show itself quite differently for individual students. With the help of the Tiny Articles, we were able to offer them a medium to make their irritation and questions of the divided world tutorial accessible after a phase between defense and integration. The progressive impulses of the lecture were able to stimulate the exploration phase in the model, in which the questions and feedback of fellow students in the tutorial played a crucial role. In the integration phase, students finally succeeded in formulating their own human science research question of personal interest to them. In the Tiny Articles exam, they finally described a rudimentary human science approach to answering their research question with reference to scientific publications. This was presented to the teachers and learners in the last phase in the lecture and could thus be transferred to the shared world.

Through this cyclical progression, students successively learned a process of reflective thinking by formulating their epistemological interests and subjecting them to scientific scrutiny. The individual stages in the thinking process could always be accompanied by Tiny Articles. Even beyond the events, students have now internalized a cycle of thinking and reflecting that can accompany them throughout their studies.

Figure 1.
A theoretical framework for Learning with Tiny Articles based on the Practical Inquiry Model (Garrison et al., 2001, p. 9).
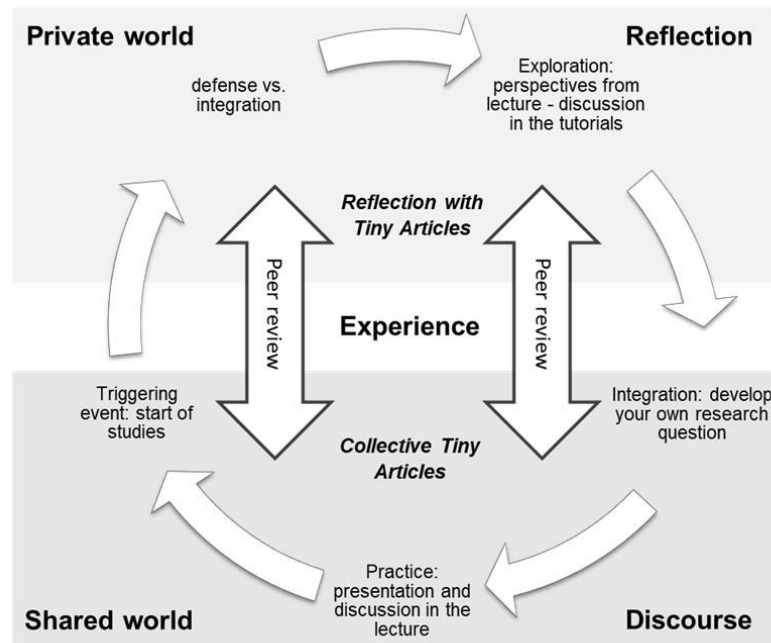
3. LEARNING WITH TINY ARTICLES

For designing the virtual learning space, special attention was paid to balance between factual orientation (e.g., specialist knowledge, learning strategies), transferable skills (e.g., interdisciplinary teamwork, ethical thinking, scientific language skills) and individual aspects (e.g., own reflections). By involving student tutors as peers, both in tutorials and lectures, special attention was paid to aspects of social interaction. The organization team strived for an open-minded and approachable attitude. The lecture was conducted as a lecture series with varying presenters every week. Thematically, the focus was set by weekly key questions, which were addressed by guest speakers with different scientific backgrounds. The design of the lecture was to present a variety of learning and research methods. With this, the students experienced innovative presentation formats in addition to conventional teaching and learning methods. For example, panel discussions, interviews, storytelling or tandem talks were offered, in which guests contributed impulse presentations with complementary individual approaches.

After each lecture the students were invited to write short texts with their thoughts, intentions, challenges and questions. These texts are called Tiny Articles. A novel format of simplified scientific publications (e.g., a journal paper) was created. This idea was inspired by the mobile app Blinkist (Blinks Labs GmbH, 2023), which provides short summaries of key messages of books in a series of so-called blinks with 2-3 minutes reading time each. In each blink one key message is presented in a short text. We adapted the concept of a blink to a Tiny Article by limiting the length of the short text to up to 1000 characters, which corresponds to about 60-90 seconds reading time. Additionally, the Tiny Article was complemented by a title (with max. 100 characters), an optional figure (e.g., an image or a graph) and up to 5 citations (of other Tiny Articles, lectures or scientific publications).

The content of the Tiny Article was very individual. The following questions (among others) could be addressed: Which key messages can be noted for future academic activities? What was new or interesting? Which associations were observed? Which questions remained open?

The weekly Tiny Articles were published in a public whiteboard which could be read by all students and the presenters of the lectures. The use of digital collaborative writing tools (e.g., Padlet and Etherpad) has proven to be helpful to ensure transparency and participation. Questions of data protection, data security and the preservation of personal rights when using web-based tools were critically reflected. Students did not need to register or login to access padlet. Each student was creating a short name (with four letters) as an identifier of the person. The name of the real person presented by the short name was only known within the tutorial group of students and tutors.

Students were divided into eight tutorial groups to discuss individual weekly Tiny Articles in a protected setting with their peers. In the upcoming tutorial the students were then asked to read and comment on selected Tiny Article of their peers. In this process, attention was paid to an open feedback culture as well as compliance with communication rules in the digital space following the concept of non-violent communication (Rosenberg & Chopra, 2015).

Based on the comments provided by the peers, the students were invited to revise their Tiny Article. Additionally, in each tutorial an Essence Tiny Article was created based on the most interesting insights of the individual weekly Tiny Articles. At the beginning of the next lecture, selected Essence Tiny Articles were presented to all students and made available to the speakers of the lecture as a learning result. This recurring writing and reflecting exercise promote the motivation for independent and cooperative reflection. At the same time,

an inclusive attitude towards heterogeneous and interdisciplinary teams should be stimulated by further developing the written Tiny Articles in an interdisciplinary and collaborative manner in the tutorial sessions.

At the end of the teaching program students were asked to write an additional Exam Tiny Article on a self-selected scientific question. They were asked to present their Exam Tiny Article in the final lecture in breakout sessions with 6-8 students. Based on the feedback they received after their presentation, all students were allowed to revise and submit the final Exam Tiny Article within two weeks.

Figure 2.
Flowchart describing the teaching concept "Learning with Tiny Articles".
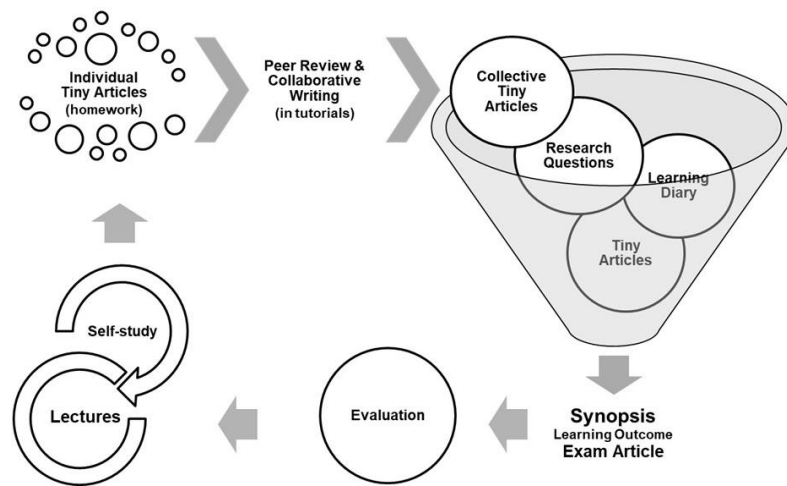
4. FUTURE RESEARCH DIRECTIONS

For the future development of the teaching course "Learning and Working Strategies" we would like to focus more on the individual developmental process of the students and also document it retrospectively. We plan to further develop the peer review process in the tutorial, in which the students in small groups deal more intensively with selected Tiny Articles in the character of a collegial case processing. The typical roles in a scientific peer-review process of authors, editors, and reviewers can be alternated. A possible theoretical framework for a guided simulated writing conference in the tutorial is offered by the structural model of the topic-centered interaction. In addition to the Exam Tiny Article, it is further planned to submit a portfolio at the end of the semester that documents the developmental stages and can also serve as inspiration for the students in the further course of their studies.

Another aim is to ask the students to take responsibility for further developing and fine-tuning the process of learning with Tiny Articles. They can suggest new rules which are again communicated in the format of Tiny Articles to all tutorial leads. If the proposal is approved to fit the overall concept of the lecture, the students of the tutorial can vote and select and try out new rules. In order to make learning more effective a development of objective measures of learning outcomes is planned.

Learning and working with Tiny Articles is used in other courses in the Institute of Sport Science at Technical University Darmstadt. For instance, students in the biomechanics seminar are creating wiki modules about advanced research topics in the field. With the help of Tiny Article, they present the concept of the envisioned wiki module to students of the biomechanics lecture. These students are the potential future readers of the teaching wikis. By providing feedback on the Tiny Articles (in reflection Tiny Articles), the students of the seminar can fine-tune the design of their wiki projects to meet the needs and interests of students in the lecture. This is an example how Tiny Articles can be used to connect learning processes between different courses running in parallel at the university.

Currently, we started to transfer the concept of Tiny Articles in the design of scientific and cross-professional meetings like the Movement Academy at TU Darmstadt (https://padlet.com/aseyfarth/MovA22). All participants of the meeting (academic and non-academic professionals, patients, students, PhD researchers) are asked to write Tiny Articles on their reflections during the meeting. Again, the Tiny Articles are peer-reviewed by other attendees of the meeting and a revised version will then be published as a "micro-publication". Publications with Tiny Articles are easy to use by a broader public compared to scientific publications which are much more challenging to create and to read.

5. CONCLUSION/DISCUSSION

The described concept of learning with Tiny Articles enables a protected environment for developing individual reflections and for collaborative learning. The result is a learner-centered learning space that practices scientific work in a new publishing way. The use of digital tools has a bridging function by enabling time- and location-independent and secure networking. By creating and sharing Tiny Articles about academic lectures, a collection of main ideas of all – called the common brain – is generated. This collection can be structured, annotated, modified, reviewed and discussed. Using interactive tools like digital pinboards or etherpads, students step out of their role as recipients and create their own learning materials. They can search for further information, modify it, and thus co-construct knowledge. By presenting opinions and attitudes in social software, the subjective perspective of learners is becoming more important (Jadin, 2007). Learning with Tiny Articles can thus lead to confrontation with different perspectives and viewpoints.

Comparable to connectivism-based learning systems (Siemens, 2005), an open and needs-based learning environment is created that allows interaction with learners and teachers. The joint construction of knowledge and ideas enables the discussion of opportunities for networked thinking, learning and working processes in diverse teams. With this, a conscious learning experience can be created and students were able to develop a creative and cooperative learning process based on Tiny Article and a structures review and communication process which was organized in the tutorials (peer-review) and lectures (presentation of Essence Tiny Article).

The teaching evaluation of the lecture shows that 81.3% of the students actively participated in over 80% of the sessions (feedback from n=75 students) and indicates the following insights:

- The collaboratively developed through digitally available Tiny Articles specifically encouraged independent and cooperative learning, reading, reflection and problem solving as well as oral and written exchange about forms of scientific communication.
- The technical requirements for this teaching concept are low and the potential for transferability to other courses is high.

- The goals of the introductory phase, to inform, motivate and prepare for research-oriented studies, could be achieved through a high and almost constant participation of the students in lectures and tutorials and a high willingness to write the Tiny Articles.
- Although the courses are demanding, the respondents did not state that they were overwhelmed and the majority stated that the course had stimulated their interest and that they were encouraged to work on their own/to think for themselves.
- The digital communication and cooperation options, the support and supportive feedback offers as well as the consideration of previous knowledge were rated as very good by the majority.
- It was emphasized that through the creation of and the exchange about the Tiny Articles, the content and topics were dealt with continuously and not selectively (in the examination phase), as was previously the case.
- The conception based on Tiny Articles contributes to the students' constant examination of scientific topics and to an independent, collaborative and result-oriented learning process.
- The opportunity for teachers to view and perceive results, learning progress and learning difficulties via the Tiny Articles during the semester enables student-oriented teaching and testing.

The use of Tiny Article was a new experience for both students and lecturers likewise. At the beginning a key challenge for many students was to know how to write concisely in scientific language. After writing a series of weekly Tiny Article they became more and more comfortable and trustful in their learning experience. By writing weekly Tiny Articles the students learned to formulate their reflections and insights as well as to share and complement their understandings in a virtual common brain contributing to a growing mindset of all participants (Hochanadel & Finamore, 2015). This collection of knowledge, ideas and reflections were also shared with the presenters of the lectures and opened up possibilities for networked learning and working in mixed teams.

In summary, Tiny Articles are an efficient and easy-to-use-tool that promote engagement and collaborative learning. By creating a common brain with rich interactions and an open access library with a review process, learning across disciplines and within society becomes more dynamic and different perspectives and upcoming ideas can be reflected.

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