

How to produce and acquire regional knowledge digitally and in print: Conceptualisation of the RegioDiff-Project

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Theoretical Background

Acquiring regional knowledge and interacting with the immediate surroundings enable children to process democratic constructs and to live participation and involvement in a wider context (Thiedke, 2005). In school, the acquisition of knowledge in general is closely linked to students' reading competencies (concept of content literacy: e.g. Ajayi and Collins-Park, 2016). Since digital media has become a rich resource of knowledge, acquiring knowledge is also depending on the students' (and teachers') digital competencies (European Commission, 2019). In a classroom, teachers encounter diversity in both mentioned competencies. Differentiation can help to foster students according to their needs (van Geel et al., 2018). A digital learning environment can (a) ease differentiation processes for teachers (Mahoney and Hall, 2017) and (b) support students' approximation to take advantage of digital opportunities and might therefore, bridge digital divides (OECD, 2000). The ongoing project **RegioDiff** refers to these topics in a unique way that involves students and teachers of primary and secondary classrooms.

The Project RegioDiff

RegioDiff (German title: Regionen der Steiermark kennenlernen: Differenzierte Sachunterrichtsmaterialien für inklusiven Unterricht in der vierten Schulstufe; English translation: Discovering regions of Styria: differentiated materials for inclusive content lessons in Grade 4) stands for REGIONal Knowledge and DIFFerentiation. The project aims at producing and acquiring regional knowledge by employing digital and analogue elements in writing and reading processes, always focusing on ways to foster all students in a diverse and inclusive classroom.

Phase 1* (07/2019-08/2020)

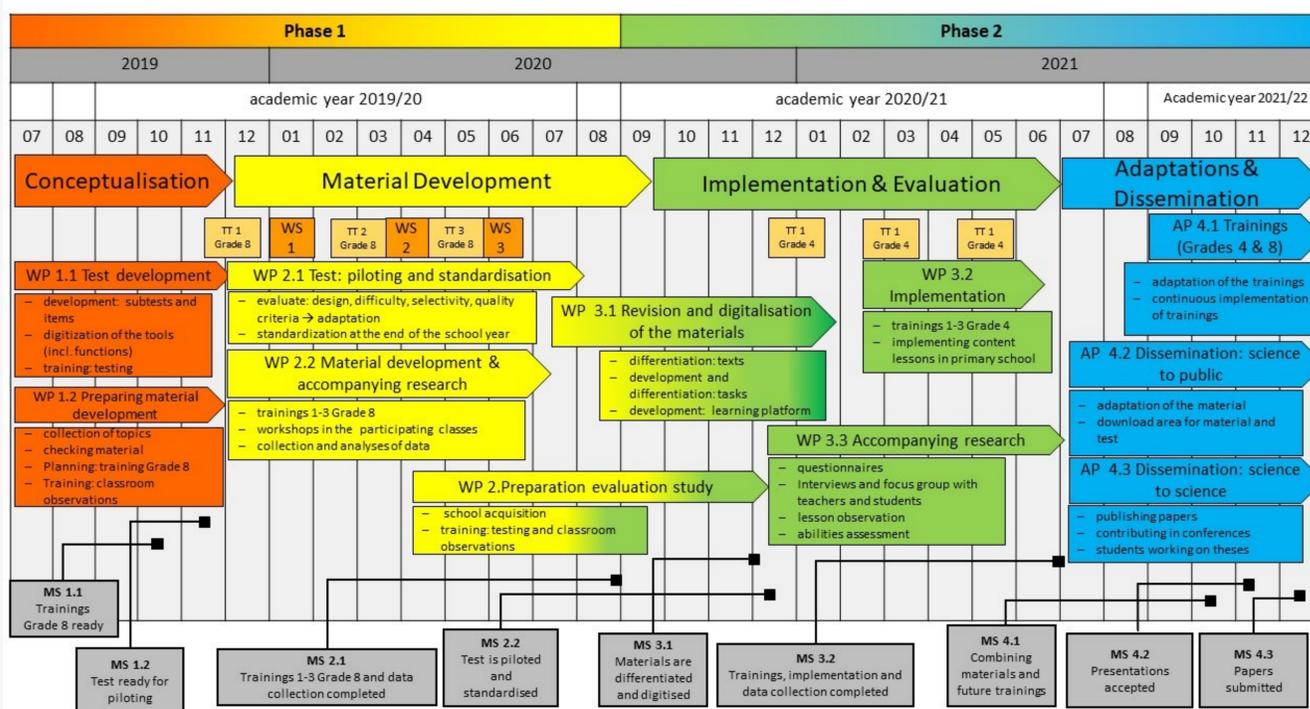
Grade 8 students (12 classrooms) produce texts concerning regional aspects (geographical, historical, architectural, social, etc.) of the federal state of Styria (Austria) by using cooperative learning methods (in groups of four students). Cooperative learning methods have been proven to enhance students' participation and learning outcomes (Hattie, 2008).

Students use digital and analogue means for content research and text production. To ease the assessment of knowledge gains, we developed a digital tool that enables teachers to set up tasks for groups and/or individuals in a virtual classroom. Students are asked to write down all content that they connect to a certain (regional) topic (one knowledge-content per line).

Additionally, we conceptualize, develop and pilot a digital reading test for Grade 4 students (used in Phase 2).

Phase 2 (09/2020-12/2021)

The texts produced in Phase 1 are revised and differentiated (4 difficulty levels). Additionally, the texts are enriched with vocabulary work (Seifert, Kulmhofer, Paleczek, Schwab and Gasteiger-Klicpera, 2017), reading strategy (Spörer, Brunstein and Kieschke, 2009) and comprehension exercises that have been shown to support reading comprehension (RAND Reading Study Group and Snow, 2002). These developed working sheets (texts and exercises) are then implemented in a digital learning environment. Grade 4 students (about 15 classrooms) work for ten weeks (two lessons per week) with either the print or the digital materials. Students are assigned to the text differentiation level according to their reading skills that are assessed beforehand with the digital reading test developed in Phase 1.



(Some) research questions

Phase 1

Teachers: How do teachers judge the relevance and sustainability of the teacher training / the methods taught / the tools implemented? How do teachers use cooperative learning methods above and beyond the project's scope (before and after project participation)?

Students: What challenges and benefits do students encounter when (a) researching, and (b) producing texts with cooperative learning methods? Do students gain in regional knowledge? What are the impacts of using cooperative learning methods on class and individual level in terms of social-emotional well-being?

Digital knowledge tool: How can a digital assessment tool for students' knowledge look like? How do teachers / students perceive / judge / implement it?

Phase 2

Development of a digital reading test: What does a digital assessment look like to (a) assess reading comprehension in various dimensions in Grade 4, (b) in a not too time-consuming manner while (c) providing satisfying criteria for test quality?

Implementing differentiated materials in content lessons: How do teachers implement the materials digitally / in print? What are the challenges / benefits teachers and students report? Which elements (texts, reading strategies, reading comprehension elements) ease / prevent a successful and motivating work with the materials? Do students reading comprehension skills and their regional knowledge benefit from the materials?

Comparing print vs. digital setting: Do the groups differ in gains in knowledge, reading comprehension development and/or motivation when working with print or digital materials (students' voices, teachers and assessment)?

Design and Instruments Phase 1

Various research methods are employed to closely accompany teachers' and students' processes.

- observing teacher trainings and classroom lessons
- interviewing teachers and students
- assessing students' gains in regional knowledge (pre- and post-test with digital knowledge tool)
- monitoring (questionnaires, Likert scale with 5 options offering anchors)
 - elements of cooperative learning methods in an online questionnaire (20 items, e.g. Students help each other.).
 - classroom climate (18 items, e.g. We do not want to interact with the outsider of our class.)
 - life in the classroom (two perspectives: e.g. How often do you help a classmate when he/she needs help? How often do your classmates help you when you need help? (each 15 items)

Design and Instruments Phase 1

In a pre- and posttest design:

- assessing students' gains in regional knowledge (digital knowledge tool)
- assessing students' reading skills (digital reading comprehension test: 36 items word-level with an internal consistency of $\alpha=.91$, 16 items sentence-level $\alpha=.81$, 16 items text-level I $\alpha=.87$, and two Maze-procedures with 15 items each for text-level II $\alpha=.78-.80$) (comparing to a control group for reading).
- conducting classroom observations and teacher training observations as well as evaluations
- interviewing students & teachers to monitor the implementation of the digital and print materials in content lessons and to gain information about motivational aspects

***Note:** Due to COVID-19 measures taken in Austria (spring 2020), it was not possible to implement all elements planned in Phase 1. However, we received 13 texts written by students of three different classrooms and produced more than 70 differentiated regional texts for Phase 2.

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