

# **LernplattformGW – Learning about and with Geomedia. A Concept for Tutoring and an OER Platform for the Education of Student Teachers**

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## **Abstract**

The University of Salzburg has linked up ('clustered') with several other Austrian Higher Education Institutions (HEI) to develop and deliver the next generation of education for student teachers. Based on a reformed curriculum with a strong emphasis on pedagogical concepts and skills, courses have been developed with uniform structure and content across multiple institutions and locations.

This step was considered of particular importance due to changes in students' backgrounds and career stages: an increasing number of future teachers are completing their training based on prior academic and professional experience while working (mostly) part-time. This offers the opportunity for more mature and experienced individuals to enter the teaching profession, but also challenges traditional organizational formats of teacher training.

Based on an extensive survey of current students, this paper explores the range of personal and professional backgrounds and attempts to establish a framework for facilitating teacher education with reduced classroom presence as well as enhanced support for independent and flexible learning.

From evaluation and assessment of results as well as from assessing organizational experiences during the first year, advantages of cloud-based learning infrastructures are clearly seen. Making the (secondary) teaching profession more accessible for mature individuals and establishing a practice of individualized learning for future teachers, an OER platform provides the basis to emphasize active learning and critical assessment of experiences in tomorrow's classrooms over more traditional 'teaching' formats.

## **Keywords:**

education of student teachers, curriculum planning, web-based courses, open educational resources (OER)

# 1 New developments in Austrian teacher education

## Clustering Higher Education Institutes

The University of Salzburg has linked up with several other ‘Central Austrian’ Higher Education Institutions (i.e. HEIs within the federal states of Salzburg and Upper Austria) to develop and deliver the next generation education of teachers. In 2013, the Austrian government decided to establish four cluster regions as ‘Bildungsverbund’, where the curricula of all institutions offering teacher education were harmonized to develop common curricula and to set up study programmes in cooperation with each other (Republik Österreich, 2013a). This led to universities and university colleges of education (‘Pädagogische Hochschulen’) co-operating, pooling their experiences, and adjusting and converging their different views on teacher education.

This ‘harmonization of studies’ (BMWF, 2013) opened a new and single teacher education programme in Austria for all secondary schools in general education. For almost 50 years, university colleges of education have been training students to become teachers for standard secondary schools (‘Neue Mittelschule’ / formerly ‘Hauptschule’), attended by pupils aged 10 to 14. On the other hand, universities themselves prepared teachers for grammar schools (‘Gymnasium’ / ‘AHS’ – Allgemeinbildende höhere Schule ) and vocational high schools (‘BHS’ – Berufsbildende höhere Schule), where pupils usually graduate at the age of 18 or 19 with a general university entrance qualification (‘Matura’ / ‘Abitur’). These two parallel traditional tracks of teacher education have been combined, leading to a lot of change for students, lecturers and institutions. In order to generate synergies, HEIs were prompted to co-operate by focusing on their individual strengths, and to offer courses at different locations within the respective cluster region (Republik Österreich, 2013b).

## New structure of teacher education and ‘Geography and Economics’ studies

Following this mission, five institutions in Central Austria – the universities of Salzburg and Linz, and the university colleges of education of the diocese of Linz (‘PH-Linz’), Upper Austria (‘PH-OÖ’) and Salzburg – developed a new curriculum for the school subject ‘Geography and Economics’ (‘GW’<sup>1</sup>) in secondary schools, published in June 2016 (Universität Salzburg 2016a, 205-218; Universität Salzburg 2016b, 94-97). This combined subject is taught in each year of secondary school, typically in two sessions per week. The subject focuses on humans as living and working individuals, organized into social groups and society, affected by and influencing the natural environment. It deals with households, employees and employers in companies at the local level, inhabitants of villages, cities and regions, up to citizenship of states and unions of states, and links to global associations (BMUKK, 2000; BMB 2016).

These study programmes are split into four years of study for a first Bachelor’s degree (240 EC) and two years of Master’s studies (120 EC / ECTS credits). They address different domains in the sciences of Geography and Economics, the didactics of ‘GW’ as a specific

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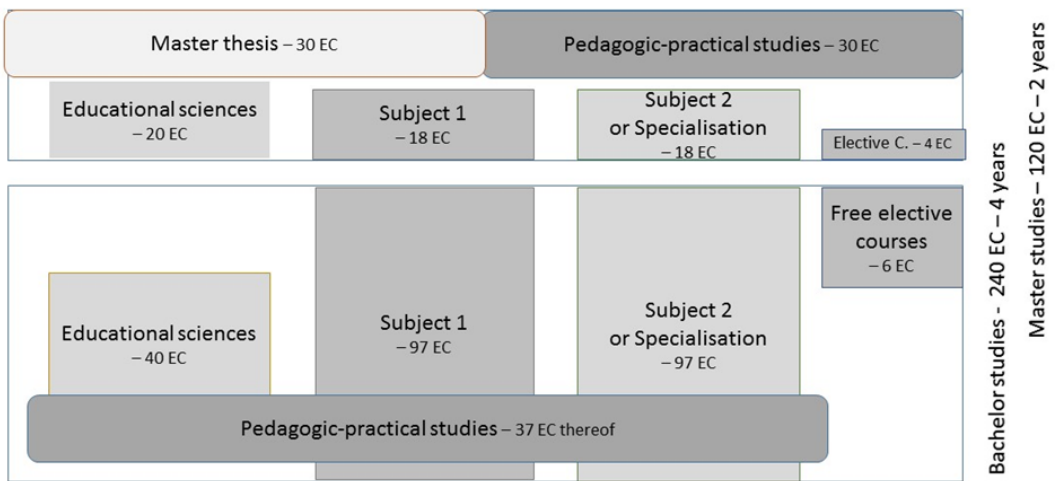
<sup>1</sup> ‘W’ means economics; ‘Wirtschaft’ in German.

subject in Austria, and – like all other teacher education programmes – educational sciences and practical training as well.

After two years of development, these study programmes were launched in October 2016. During the process of developing and enrolling students in the new programmes, two challenges were discussed:

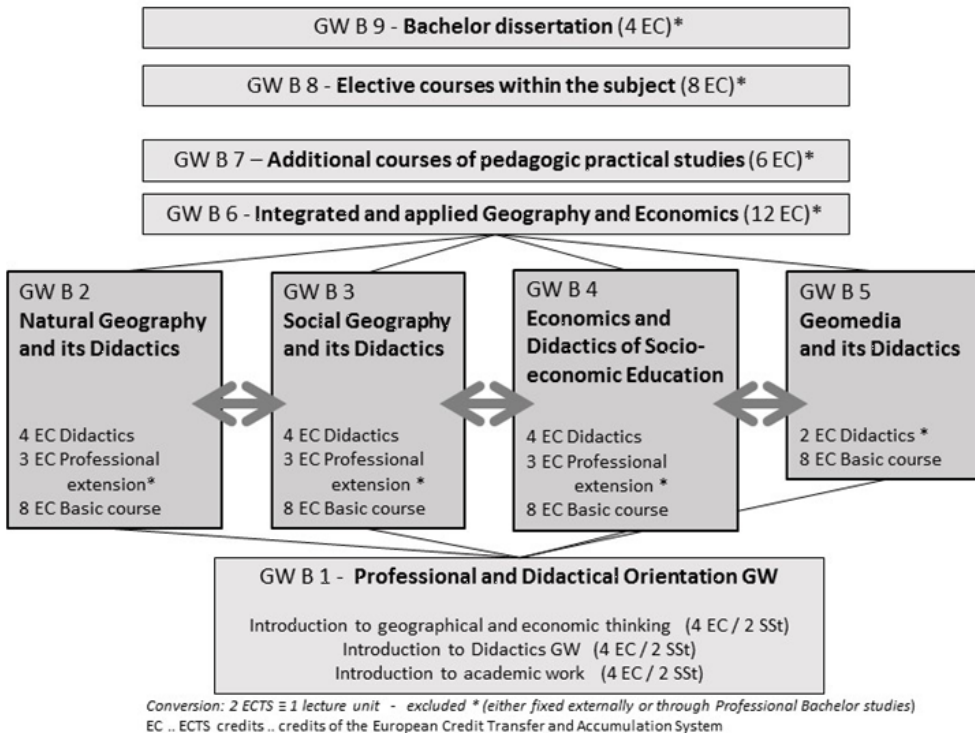
1. How can we arrange parallel courses in two cities (Salzburg and Linz, 130 km apart) on a comparable level of quality and with the same requirements?
2. How can we take into consideration the personal environments of our students in the 21st century, especially those who have to work part-time?

### Education of student teachers in the region Central-Austria



**Figure 1:** Structure of teacher education in Central Austria

# Bachelor studies for GW in the region Central-Austria



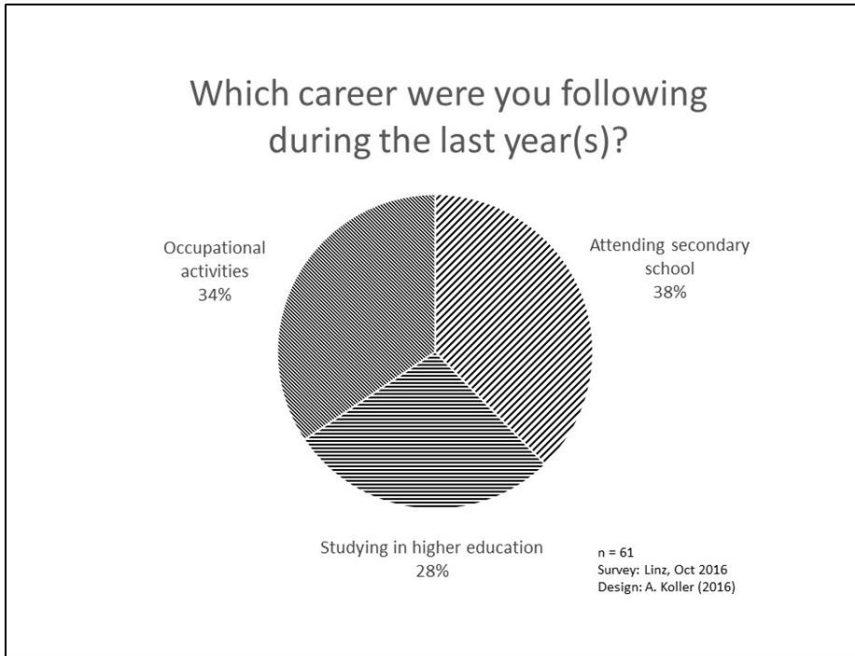
**Figure 2:** Domain structure of bachelor programmes in 'Geography and Economics' (GW)

## Students' personal environments

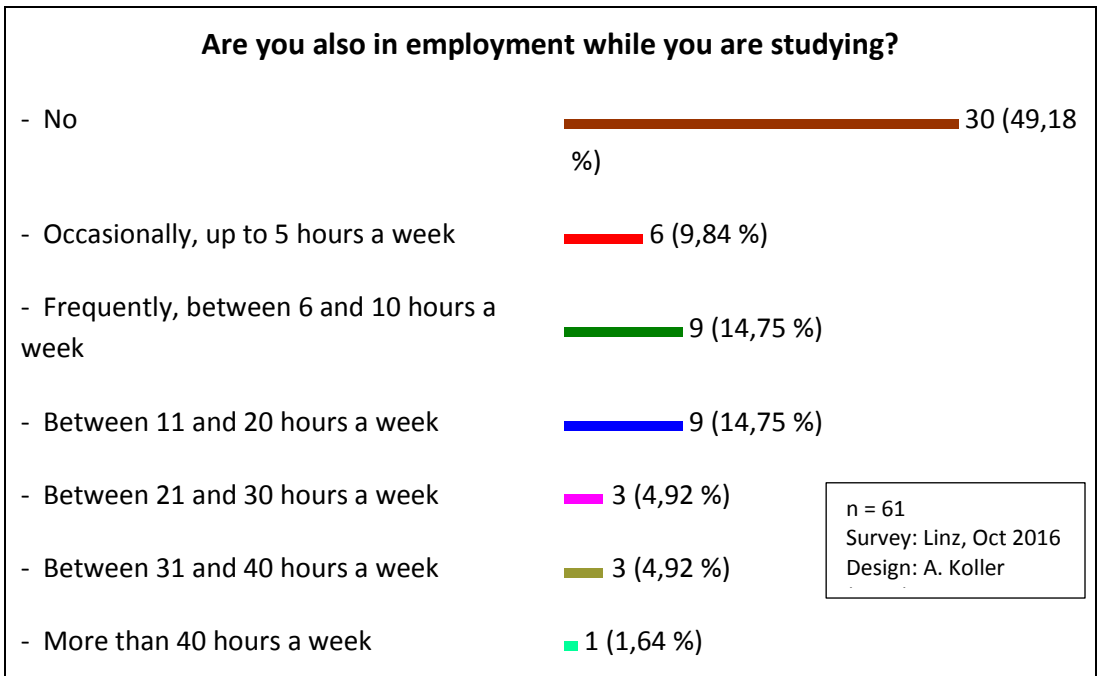
Whenever new study programmes are established, monitoring and evaluation are important elements of a professional and successful development. That is why, at the beginning of their first semester, students at PH-Linz were asked to describe their first impressions, their degree of satisfaction and their personal environments. They were invited to participate in this survey during the STEOP<sup>2</sup> lectures and via email. 61 students out of a total of about 80 responded. Two questions out of the total of ten focused on the students' employment status in the year(s) immediately prior to starting these studies.

- Which career were you following during the last year(s)?  
(occupational, studying in higher education, attending secondary school)
- Are you also working in employment while you are studying?

<sup>2</sup> STEOP – 'STudien-Eingangs-und-OrientierungsPhase' – starting period of studies and time for personal orientation: Are these studies my correct choice? Which questions will be asked in the domain later on? Am I really interested in these questions?



**Figure 3:** Occupation before starting education of student teachers



**Figure 4:** Occupation during education of student teachers

The survey shows the importance of employment in the students' lives. Less than 40% of students started studying immediately after their final high school exams (possibly followed by a year of personal orientation, or doing military or alternative service). Almost 30% already had experience of studying other subjects; ten out of 61 (16%) had already finished studies in higher education. One third of the students surveyed had been employed for more than a year.

Nearly one half of our students were working, mostly part-time, while following their studies. Surprisingly, more than 10% were working more than 20 hours per week.

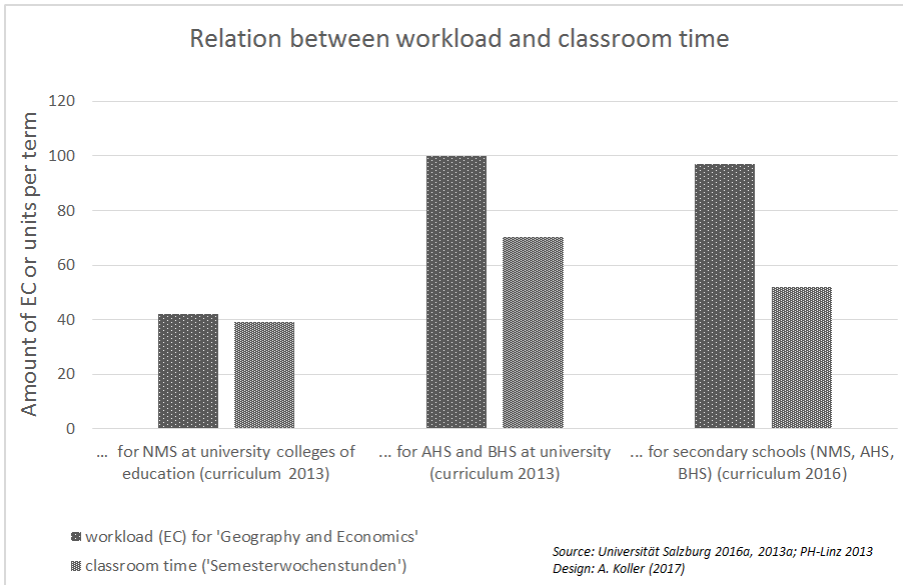
To summarize our personal observations: more mature and experienced individuals are entering the teaching profession, hence posing challenges for the traditional organizational formats of teacher education.

### **Consequences for the curriculum and courses**

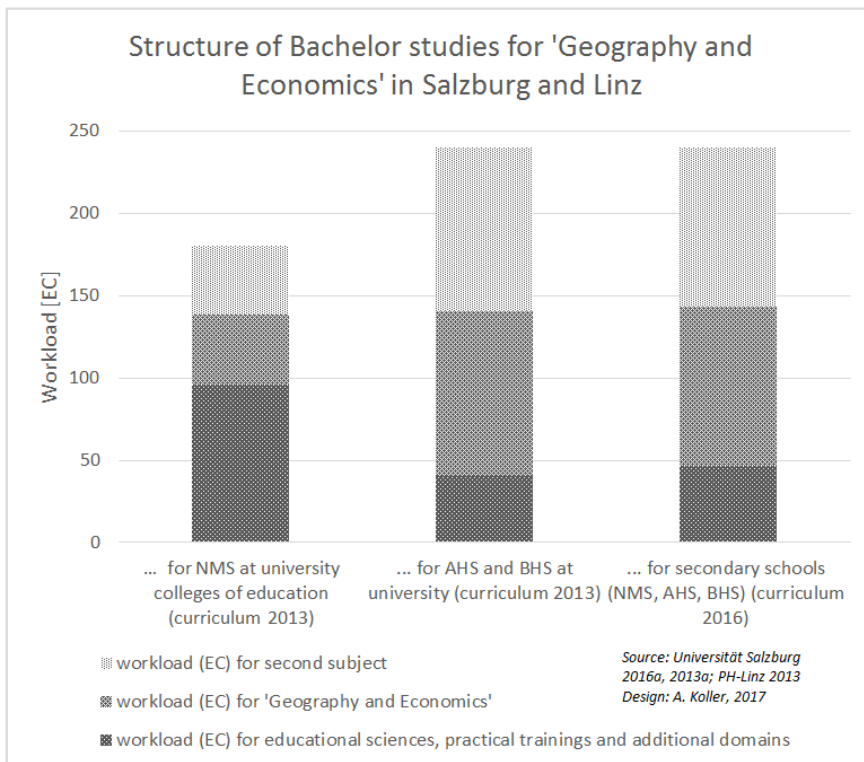
Some of these aspects and consequences had already been considered during the planning process of the new curriculum (for Bachelor's programmes in 'Geography and Economics', see Figure 2). One of the consequences is that lecture time has been reduced, from approximately 70 down to 52 hours over four years, while the workload of students has been kept high (around 100 EC), as in the former curriculum of teacher education at the University of Salzburg (Universität Salzburg, 2016a & 2013a). In contrast, the workload for students at university colleges of education has risen from 42 up to 97 EC in the new curriculum (Universität Salzburg, 2013a; PH-Linz, 2013). For these students, the consequences are a longer duration of their studies (eight instead of six semesters), higher workload for several scientific domains, and a reduction in additional areas (e.g. educational law, digital competences, or general information on assessments), which are now integrated into the lectures of each subject.

To quantify differences in detail: 52 lecture units (45 minutes each) in the new curriculum correspond to approximately 600 hours of work at university, based on 15 weeks per semester, just a quarter of the entire workload (97 EC x 25 hours = 2,415 hours). Thus, students are expected to allocate three quarters of their time to reading further literature, handling assignments and preparing for assessments, a substantial amount of work time.

In order to be able to study successfully, students require suitable environments. Students have to complete intense and challenging coursework. All lecturers and institutional structures aim to guarantee the high quality of courses and of the learning environments. A web platform has been established to support this.



**Figure 5:** Development of EC and units to be attended from old to new curriculum



**Figure 6:** Comparison of workloads between old and new study programmes for a Bachelor's degree

## 2 An OER platform for learning resources

### Technical background and state of development

The ‘LernplattformGW’ (learning resources for ‘Geography and Economics’) has been online ([gw.lernplattform.schule.at](http://gw.lernplattform.schule.at)) since the academic year 2016/17, under the course range ‘Lehramtsstudium GW im Cluster Österreich-Mitte’. It follows UNESCO’s definition (2002) of open educational resources (OER), is based on Moodle technology, and is provided by a professional organization, EduGroup Inc. ([www.edugroup.at](http://www.edugroup.at)), which has wide experience with Moodle platforms and provides several educational services for the Austrian Ministry of Education.

In the domain of Geomedia, 23 web courses with online resources were developed during the first year, covering subjects within cartography, geoinformatics and geomedia. They offer learning resources for traditional cartographic content such as topographic mapping, generalization, visualization of terrain, thematic mapping, visualization through diagrams, etc. Content on ‘new media’ is also provided, such as volunteered geographic information, location-based services, base maps and augmented reality. For further details, see <http://www4.lernplattform.schule.at/gwk/course/index.php?categoryid=18> and <http://www4.lernplattform.schule.at/gwk/course/index.php?categoryid=20>.

### Pedagogical conceptualization and future vision

At the moment, a simple traditional conceptual structure of learning resources is to be found on the platform. Each web course starts with an outline, contains slides shows (online and in PDF-format), and references to online services and other web pages. These web courses appear as a digital interface to complement university lectures, and contain all the visuals used in the lecture. They help students to compile their own personal notes, to study the content intensively outside the lecture, and to prepare for exams.

In a second stage of development, the web courses will include more assignments and tutorials, offering training in procedural knowledge and personal reflections in order to develop metacognitive knowledge (Anderson & Krathwohl, 2001). These learning resources will support students’ individual work outside university lectures, which is necessary to fulfil the requirements of the ECTS credits, as shown in sub-section 0 above, and keep learning time as flexible as possible.

Furthermore, interactive elements will be developed, giving students feedback on their learning process and opening up opportunities for flipped-classroom concepts as forms of blended learning. In this way, some elements of the MOOC concept (Robes 2012, Wedekind 2013), especially from cMOOCs, will be integrated. Our web platform will offer many and various opportunities for individual learning and active participation (Treek, Himpl-Gutermann & Robes, 2013, p. 7), but will never stand alone as an exclusive online platform like a MOOC and will not have a specific focus on allowing participants to network or on the development of one’s own content, as in cMOOCs. It serves as our answer to the challenges of multi-location study programmes and the significant number of part-time students, as discussed in section 0.



## Learning resources in the field of Geomedia

The domain of Geomedia offers particularly good opportunities for this kind of eLearning platform. Many resources are accessible online, visualization and interaction play major roles, and there are few barriers created by language or text-heavy materials. Embedding geomedia within the Moodle platform provides convenient access to a variety of online resources.

Since lectures are held in German, the abstracts, titles and descriptions on the web platform are mainly in German, as shown in the following screenshot (Figure 7).

### Großkreis Distanzen

Damit wird die kürzeste Entfernung zwischen zwei Punkten auf der Erdoberfläche definiert. Experimente die im Internet verfügbar sind - z.B.:

- <http://www.gcmap.com>
- <http://www.greatcirclemapper.net>


### Präsentationsfolien



Gestalt der Erde

Josef Strobl


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 Präsentationsfolien zur Annotation

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### Loxodrome vs Orthodrome (=Großkreis-Distanz)

> <https://www.jasondavies.com/maps/loxodrome/>




### Quiz

Stellen sie sicher, nach Abschluss dieser Lektion die nachstehende

- Warum brauchen wir unterschiedliche Modelle der Erd(gestalt)
- Worin liegt der prinzipielle Unterschied von Kugel/Ellipsoid vs C
- Welche Faktoren verursachen die Höhendifferenz zwischen Ell
- Warum ist Satellitenpositionierung unmittelbar an das Geoid-M
- Wie ist ein 'Großkreis' definiert, welche besondere Eigenschaft
- Welche 'speziellen' Großkreise definieren das geographische K
- Worin unterscheiden sich Loxodrome und Orthodrome?
- Loxodrome vs. Orthodrome: welche Verbindung zwischen zwe
- Sind alle Punkte eines Breitenkreises gleich weit vom Äquator
- In welcher Beziehung stehen Meridiane und Zeitzonen zu einan
- Drücken sie 12°12' in Dezimalgrad aus.
- Konvertieren sie 50.50° in DMS.

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### Podcast

 Kompakt wiederholt: 9.6MB Audiodatei (MP3)

### Basics of Geographic Coordinate Systems (Esri VC)

Ein optionaler online-Kurs > <https://www.esri.com/training/catalog/57630435851d31e02a43>

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### Einige Videos



-  Latitude and Longitude
-  Geoid
-  Geoid (FocusOnline)

Figure 7: Screenshot from one of the web resources

## Further use and dissemination

These web courses were developed for teacher education delivered in Salzburg during 2016/17. Next year (2017/18), when the courses start in Linz, the web platform will be developed further, e.g. more student assignments will be added. It is a major benefit of 'LernplattformGW' that all lecturers develop resources within one platform. The workload of resource preparation is shared by several lecturers, who are thus able to focus on individual topics.

The benefits are obvious from a student's perspective as well: one common platform for all institutions involved in these teacher education programmes, especially for Geography and Economics in Central Austria. There are common structures as well as one single account for all web courses. When students return to these resources at a later time, they will be able to access new and enhanced contents.

These web courses follow the principles of Open Educational Resources (OER), wherever it is legal to do so. Unfortunately, some of the media used have restricted access because of existing intellectual property rights. Thus only current university students have access to these particular media. In general, all authors and lecturers involved consider:

- *“the vision for the service: open access to the resource, with provision for adaptation,*
- *the method of provision: enabled by information/communication technologies,*
- *the target group: a diverse community of users,*
- *the purpose: to provide an educational, non-commercial resource.” (UNESCO 2002, p. 26)*

Accordingly, there is also free access for in-service teachers, who already use the web platform for their personal development and preparation of lessons in secondary schools. During in-service (continuing) professional development for teachers, these resources are further developed.

## 3 Reflexive considerations

In order to answer our research questions (see end of section 0), the OER platform 'LernplattformGW' was developed during the academic year 2016/17. As there is neither a tradition nor availability of 'standard' textbooks for teacher training education in the field of Geography and Economics, and an urgent need for flexible access to OER supporting mixed and blended formats of learning, a shared and integrated learning platform infrastructure was established.

All this required frequent and intense communication and exchange between the various lecturers and academic institutions. In order to establish interactive learning modules, more time and human resources will be necessary.

With regard to the initial evaluation of current courses and results of the students' assessment of the platform, the advantages of this cloud-based e-learning infrastructure are

clear. Making the (secondary) teaching profession more accessible to mature individuals and establishing a practice of individualized and continuous learning for current and future teachers, the emphasis in future classrooms will be on active learning and the critical assessment of experiences over more traditional 'teaching' formats.

## Acknowledgments

LernplattformGW was developed by several lecturers from University of Salzburg, PH-Salzburg, PH-OÖ and PH-Linz. In addition to the domain of Geomedia, Robert Vogler, Fritz Baier, Edith Killingseder and Thomas Jekel developed learning resources for GW didactics, and Hermann Klug in the domain of natural geography. Some elective courses were developed by Johanna Eidenberger and Wolfgang Kuschnigg. Further fields, such as social geography and economics, will follow next year.

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