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Tuning the field trip: audio-guided tours as a replacement for 1-day excursions in human geography

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Educators are experiencing difficulties with 1-day field trips in human geography. Instead of teaching students how to apply theory in the field and learn to *sense* geography in everyday life, many excursions have degraded into tourist-like events where lecturers try to motivate rather passive students against a noisy urban backdrop. Although various (partly) student-led approaches have successfully addressed the issue, there are still a high number of tours that use a traditional, tutor-led model. The example of a series of three audio tours produced at Johannes Gutenberg-University Mainz, Germany, shows how these conventional field trips can be transformed into audio tours that help students not only to better internalize human geographic learning content but also cultivate empirical research, creative thinking, and individuality. In this paper I provide a critical description of tutor-led fieldtrips. Downsides are identified and contrasted with the audio-guided tours that an increasing number of museums create for their visitors. I then show, how learning from a narrator's voice instead of from a tour guide is also not only possible in the context of higher education but in many ways may be a superior learning tool. The concept of three interlinked audio tours is presented with regard to design, production, and distribution. The need of additional learning materials such as maps, posters, and workbooks to foster active learning through creative impulses and the independent use of empirical methods are discussed, before the successful implementation into the bachelor curriculum is described. I conclude by highlighting the importance of fieldwork and by recommending audio-guided tours as a productive method of active learning.

Keywords: audio; field trip; excursion; podcasting; new media

Following the red umbrella

> A troop of newly arrived students, very young, pink and callow, followed nervously, rather abjectly, at the Director's heels. Each of them carried a notebook, in which, whenever the great man spoke, he desperately scribbled. Straight from the horse's mouth. It was a rare privilege. (Huxley, 1977, p. 19)

If you recall this passage from Huxley's 1932 novel *Brave New World* you cannot help but compare it with many 1-day field trips in human geography. To help students understand theories empirically, lecturers lead groups of up to 35 people through city streets (Bradbeer, 1996; Kent, Gilbertson, & Hunt, 1997). What might work when teaching takes place in the more silent atmosphere of a valley, woods, or canyon causes problems in the urban environment. Issues include acoustical problems, the pace of the field trip, passive learning, motivational issues, and retention.

Student often have difficulty trying to understand what the professor is saying if he/she is standing next to a highly frequented street with traffic noise and people passing by

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Deubel (2007). In the time of cell phone conversations and music coming from earphones, the already cacophonic urban setting is even more distracting. If the student does not stand close, he/she will have almost no chance to hear what the narrator is talking about.

Traditional field trips follow the *pace* of the lecturer. Sometimes even athletic students have a hard time following behind when red lights and crowded sidewalks complicate the chase. Often teaching has begun while students are still gathering, and late questions can mess up the intent and schedule of the day; and there is seldom time to explain each topic in as many ways as may be necessary (Wißmann, 2008b).

"'My good boy!' The Director wheeled sharply round on him. 'Can't you see? Can't you see?' He raised a hand; his expression was solemn" (Huxley, 1977, p. 23). Learning with traditional field trips is extremely *passive* (Haigh & Gold, 1993) and does not encourage students to think for themselves or take the time they need to really understand the issues. These outdoor lectures can end up diminishing, rather than enhancing, understanding whether already hard-to-understand auditory input is mixed with multiple visual impressions (Windham, 2007).

The group, and even the lecturer, might lack *motivation* (Jarvis & Dickie, 2010). One may argue that this is completely understandable if a tutor walks the same route with different groups over and over again, especially if the excursion has to take place outside of regular teaching times, e.g., on weekends. In an urban environment, with its complex and competing multisensory input, this lack of enthusiasm can be fatal for knowledge transfer. For learning to occur, it is crucial that the lecturer holds the group's attention (Herrick, 2010).

After spending a day in the field, all the input gathered is soon *forgotten* if no debriefing takes place (Kent et al., 1997). Looking at the amount of teaching a lecturer has to do, it can be presumed that a one-to-one discussion with every student is unlikely. As field trip's purpose is to deepen knowledge initially acquired in the classroom, the trip will probably take place at the end of the semester, when there is little or no time to meet and recap after the excursion (Fuller, Edmondson, France, Higgitt, & Ratinen, 2006; Kent et al., 1997).

As a result of the downsides discussed above, many field trips seem to degenerate into touristic guided tours in which listeners simply have to follow the red umbrella of the tour guide (Panelli & Welch, 2005). Participants frequently become distracted by the impressive cityscape that attracts every student in a different way.

More than an entertaining excursion

What is the main purpose of a human geography field trip anyway? According to Tuan (2001) "An undertaking of this sort is believed to stimulate the imagination, leading one to ideas inspired by objects in the field rather than by words in a book" (p. 42). While Hope (2009) sees the major goal is being to provide students with stimulus that helps them internalize geographic theory that they have learned in class.

Tutor-led fieldwork may be "a fairly common format in the first year", and – with the opportunity to instantly ask questions, benefit from the tutor's competence, and experience the seminar group in a different environment can be a "useful introduction to participatory fieldwork" (Kent et al., 1997, p. 317). But one way to solve the problems described in the previous section is to change the didactic model. Geographic fieldwork in higher education contains a wide variety of creative approaches to engage students and stimulate active learning. Bradbeer (1996), for example, introduced problem-based learning to geographic fieldwork. Higgitt tried to "enhance students' appreciation of local geomorphology through the construction of interpretive field trails" (1996, p. 35). In the early 1980s, Gardiner and Unwin (1986) experimented with computers in field courses:

> We believe that the field class should be viewed, at least partially, as an opportunity for students to carry out original investigations of genuine problems, in which the whole process of experimental design, data gathering and analysis, and formulation and presentation of conclusions is undertaken. (p. 169)

More recently, Herrick (2010) promoted "both autonomous and dependent participation" in both tutor-led and student-led fieldwork in her Alternative Food Movements Project (p. 113). Stainfield, Fisher, Ford, and Solem (2000) offered the maybe most futuristic alternative to physical fieldwork with Virtual Field Trips, a "digital alternative representation of reality" (p. 256) that allows "interaction with the virtual environment through participation, exploration, analysis and the learning and the testing of skills both old and new" (p. 257).

Another option to enhance the learning situation in the field is to improve content accessibility. On a tutor-led excursion, students must be able to listen to what is being taught regardless of group size and loudness in any given environment (Campbell, 2005). A look at guided tours in general shows that the tourist sector has already answered this question with audio-guided tours. Museums have long offered handset devices to guide visitors through their exhibitions.

Step closer to the next exhibit

The Sedelijk Museum in Amsterdam pioneered the use of audio tours in 1952 (Tallon, 2009). Since then "[m]useums are constantly trying to change the perception of them as being tired, old, dusty, didactic, tell-you-what-to-think experts," according to Mellard, A. Personal interview: Interim curator, Austin Museum of Art, Austin, October 5, 2011, interim curator of the Austin Museum of Art, when describing why audio-guided tours have found their way into almost every major museum. The idea behind providing visitors with audio material is not to replace human tour guides but to "enhance the visitor experience," as David Denney, director of public programing at the Bob Bullock Texas State History Museum, notes (Denney, D. Personal interview: Director of public programming, The Bob Bullock Texas State History Museum, Austin, October 7, 2011).

There are many benefits of audio-guided tours, including varying modes of learning, accessibility and flexibility, and different voices. (1) Didactically, "[i]t addresses people who learn in other ways than visual memes" (Mellard, A. Personal interview: Interim curator, Austin Museum of Art, Austin, October 5, 2011) providing both auditory and experiential learning modes. (2) Audio-guided tours open up the opportunity to get the information the listeners want where they want it, meaning that listeners do not have to follow a certain route if information on stopping points is individually accessible (Cid, C. Personal interview: Director of education, Texas Memorial Museum, Austin, October 6, 2011). "You didn't have to go in any particular order" (West, G. Personal interview: Coordinator of visitor services, Blanton Museum of Art, Austin, October 5, 2011). (3) The introduction of audio material is not just about replacing a guide with his/her voice, but also "[. . .] allows different voices into the museum. That could literally be the voice of the artist who made [the work of art]" (Mellard, A. Personal interview: Interim curator, Austin Museum of Art, Austin, October 5, 2011).

For a museum, many aspects of an audio-guided tour justify offering it to visitors. Do audio-guided tours offer similar benefits in an open urban environment in place of a lecture-guided city tour? I argue that they do. Navigating from A to B, however, might be a little more difficult. So, audio-guided city tours for students require at least a map, if not additional walking instructions. The latter can be included in the audio file with the

narrator giving helpful comments, for example, "Continue north on Congress toward the Capitol Building. Cross Eleventh St. and enter the Capitol grounds through the main gated entrance immediately to your left" (Texas Tourism, 2010, stop 4). In addition to these instructions, tips for using the audio guide and additional information about the listener's surroundings can be included. Locating stopping point and locations not only inside an audio tour but also within an urban space is often crucial to making an audio guide effective and student friendly.

One major advantage of the audio-guided tour over following an actual guide lies in acoustic quality. As previously discussed, difficulties can arise while listening to a lecturer in an urban setting if there are more than 20 people. With audio-guided tours this problem is solved. The voice from the headphones is clear to the listener and can give all the information over and over again if needed:

> You don't have to be with a whole group of people, you can be on your own, and it's more intimate that way where you can stand or you can sit and you can listen to someone describing a piece [or place]. Or, if you didn't understand it, you can play it again, over and over again, until you fully understand it. (West, G. Personal interview: Coordinator of visitor services, Blanton Museum of Art, Austin, October 5, 2011)

Depending on the effort that goes into the production of an audio tour, interviews can be added as well as differing voices, both male and female, to provide more interesting, even entertaining, content. Besides voices, music can be embedded to enrich the listening experience. If a listener is standing in front of an urban landmark, such as an old theater, and listens to the narrator's voice, some music from the time period the building was erected in might add value and understanding.

Audio excursions Rhine-Main

Three tours–three topics–three cities

Higher education has implemented audio and audio tours into the curriculum in various ways. Butler (2007) describes "two audio walks [. . .] that incorporated elements of both sound art and oral history along the banks of the River Thames in London" (p. 373). He wants to show "that the audio sound walk, or memoryscape, might offer us an exciting way of creating more nuanced, embodied, complex, multisensory methods of experiencing and representing our surroundings" (Butler, 2007, p. 375; also see Butler, 2006, p. 26). Landmarks (n.d.), the public art program of the University of Texas at Austin, produced an audio tour for works of public art that are on exhibition at the university's campus. Audio tutorials can be a way of preparing "students for unsupervised work in the field," as Meyer and Postlethwait highlight with regard to field biology (1970, p. 101). Today, problem-based fieldwork is more popular among students than "cook-tours" (i.e. Kent et al., 1997, p. 319). Audio is used to add more creative elements to field learning. Students produce an oral field guide that not only "reflects the written contributions" but also "becomes a resource for future work" (Mossa, 1995, p. 83). "The proliferation of portable, MP3-capable devices such as iPods opens up exciting new possibilities for mobile learning" (Chan & Lee, 2005, p. 68). Students create audio podcasts themselves (see Brittain, Glowacki, Van Ittersum, & Johnson, 2006) that "help alleviate some of the pre-class anxiety and allay student concerns about issues such as assessment" (Chan & Lee, 2005, p. 59). In general, podcasting is believed to bring "learning to a whole new level" (Campbell, 2005, p. 44; also see Windham, 2007). Tutors become more like mentors or advisors when students actively learn by using new media (Bremer, 2003). Traditional

tutor-led fieldwork is still used, although it is often enhanced with student-led elements to improve learning (Brittain et al., 2006; Herrick, 2010).

As an acoustic alternative to original guided tours *Audio excursions Rhine-Main* is a new approach from Germany to implementing an audio tour into the geographic curriculum (cf. Fuller et al., 2006; Panelli & Welch, 2005). The aim is to eliminate all the downsides of tours guided by both experts and voices. Without improving the learning situation, an audio excursion would be a waste of resources, keeping in mind that it has to be designed and produced before it is of actual use for teaching.

Today, fieldwork in higher education geography in Germany is diverse. Curricula list excursions, field studies, and project work. Destinations vary from local sites to far away countries, and duration from 1 day to several weeks. As for other geography classes, the state, university, department, or institute does not define specific teaching requirements. Instructors decide whether they want to use the traditional didactic model or have entirely student-led field trips. In addition to lack of instructional requirements or specified desired outcomes, a general discussion about teaching methods is also missing in Germany's Geographic higher education. With few exceptions (Kwiatkowska, 2007), scientific publications examine teaching only up to High School level (see Drabe, 2008). Publications such as Kent et al. (1997), Samuelowicz and Bain (2001), and Phillips and Johns (2012), which might offer tutors guidance for designing a field trip, do not exist for German higher education.

What should an audio tour for a 1-day field trip in human geography look like? An examination of a series of three audio tours of the *Audio excursions Rhine-Main* project launched 2 years ago will answer this question. These tours were recently implemented in the bachelor curriculum into geography at the Department of Geography of Johannes Gutenberg-University (JGU) Mainz, Germany. For that purpose a whole new mandatory module was created called *Empirische Kompetenzbildung Rhein-Main* (Empirical Competences – Rhine-Main, see section "Implementation"). The major goal of the module is not only to get students out into the field to experience geography empirically, but also to learn how to use empirical methods of social sciences at every stop of the field trip (cf. Panelli & Welch, 2005).

The three audio tours are designed according to basic seminars the Department of Geography at JGU offers for human geography: settlement, economic, and social geography. Using examples, the stopping points illustrate topics from corresponding seminars. Theories of Fordism and Post-Fordism are discussed at an *Opel* car factory belonging to *General Motors*. The economy is studied at the headquarters of *Deutsche Bank* and *European Central Bank*. Postmodern lifestyles and leisure behavior are illustrated at *Cinestar*, an urban entertainment center. To create additional synergy, many of the stopping points relate to each other and the three audio tours are interlinked with regard to content.

In contrast to audio-guided tours in a museum, students not only have to follow a certain route but are also asked to contemplate how each stop relates to others on the same tour or on previous tours. This structure again deepens understanding by repetition and highlighting existing links between topics and stopping points.

The tours take place in the Rhine-Main area in the Cities of Mainz, Wiesbaden, and Frankfurt am Main. When taking the tours in the recommended sequence, students experience the following: starting in Mainz they learn about settlement geography over the course of more than 30 stops. Traveling from the Roman Empire to post-modernity, students end up at a bus station where they can take a ride to the first stop of the second field trip. Within 5 min they start learning about social geography in the city of Wiesbaden while on the bus or while walking the default route with a supplied thematic map in their

Table 1. Active learning with the audio tours' workbooks.

Example site	*Hintere Bleiche – Mainz* stopping point 8, audio tour 1	*Europaviertel – Wiesbaden* stopping point 25, audio tour 2	*Messe – Frankfurt am Main* stopping point 8, audio tour 3
Topic	The challenges of present-day city planning with regard to preservation	Segregation and integration in urban areas	Formulate research questions and conduct empirical research on your own
Method	Sketching and diary	Media analysis of a daily newspaper	Open
Impulse	"As a city planner you are asked to restructure Hintere Bleiche [street] in the area of the medieval city wall. Sketch and note how you would modernize the area and at the same time preserve the historic structure. Justify your solution." (Wißmann, 2009, p. 18 – translated from German)	"Check the local section of your newspaper for the following keywords: Europe, living, integration. Highlight these words in different colors and write down in what context they appear." (Wißmann, 2011, p. 52 – translated from German)	"This is the first stopping point of your own research project. What did you always want to know about Frankfurt? What sounds fascinating to you? Write down your research question and start collecting data. You will have a chance to continue your research at stopping points 13, 17, 19, and 26. Which empirical method(s) you use is up to you." (Wißmann, 2010, p. 18 – translated from German)

hands. Experiencing everything from migration issues to social diversity, students finally end up at the train station, where they take the train to Frankfurt am Main, a global banking center and home to the headquarters of major financial institutions such as *Deutsche Bank* and the *European Central Bank*. There, students continue their field experience in human geography by learning about economics. Having reached the last stop of the 90-stop tour, a final train ride takes them back to Mainz, where the first field trip began. As the samples from all three audio tours in Table 1 show, each stopping point uses examples to help students refresh their knowledge of topics discussed in class, and review geographical theories and models critically.

With overall 90 different stopping points and research impulses – i.e. work tasks in the accompanying workbook to perform empirical fieldwork – students are unlikely to walk all three audio tours in a row. But the possibility of doing so illustrates that this format allows students to choose their own pace. If they feel like continuing an audio tour on another day, they can. And, if they want to extend the lunch break to write down individual experiences or revisit some stops to replay the audio material, the audio tour gives students this opportunity. The tours may occur over several days or completed in less than a day each. The decision is the student's.

All three audio tours are designed as 1-day field trips. They come with high-quality audio files and additional material that is handed to the students in an introductory classroom session. To ensure that students reach all stops and actively look into each learning content unit, the audio files come with a workbook. This workbook requires students to keep a diary and complete empirical research exercises. A picture must be taken of every stop along the route. A thematic map, provided by the lecturer (Figure 1), of each city and route completes the learning material.

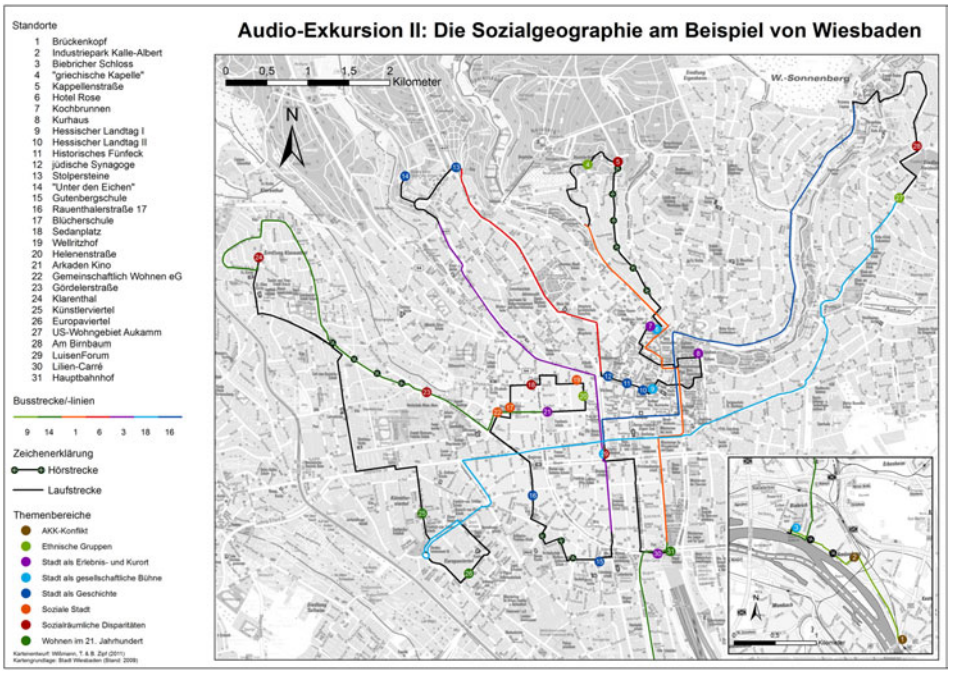

Figure 1. Map, audio tour 2: social geography, Wiesbaden.

Design–production–distribution

Each audio tour is designed to provide students with the best content possible for their field experience. All topics have been developed with the tutors who teach the module. Every stopping point matches an issue already discussed in class. A look at the first audio tour in Mainz shows how learning content is migrated from in-class teaching and textbooks to an audio tour. The decision to choose Mainz as the location for settlement geography research arose from its rich and variable history as a former Roman military base, medieval city with economic privileges, home of baroque Catholicism, stronghold for Napoleon's troops, target of a massive air strike during World War II, and example of urban rebuilding from postwar to postmodern times. To educate students about these different time periods and to illustrate how a city evolves, there are 33 stops exemplifying subtopics such as *the Roman city*, *housing in Wilhelminian time*, and *suburbanization*. For example, there are three stops that deal with the Baroque Age alone. Stopping at the Citadel of Mainz, students listen to a narrator talking about the fortification systems of French military engineer Sébastien Le Prestre de Vauban, who worked for King Luis XIV:

> Because of changing warfare – think about the increasing use of gunpowder and firearms – 17th-century fortresses needed new defensive fortification. [. . .] typical for the fortifications of Vauban are bastions integrated into the walls, which results in a jagged or star-shaped profile. (Wißmann, 2009, p. 4 – translated from German)

To strengthen the storyline, additional sound samples can be heard, in this case baroque marching music (Oblinger & Hawkins, 2006). After pointing out that where today there are houses, trees, and roads, guards once observed a vast and open field for potential enemies, the narrator asks the student to march along the walls to the music for a while as if they were "on watch":

> Try to imagine living in the 17th century. You are standing on the walls of the Citadel of Mainz, the heart of the fortification and control center of military decision-making. The wall incorporates thirteen to sixteen bastions, four of them to be found in the Citadel alone. Trenches are up to 50 m in width. From your post you watch over the whole area. If enemies should approach the city you can spot them early and cross fire at them from all bastions. Start your patrol down the battlement until after about 200 m you reach a staircase leading into the Citadel's interior. Then move on to the next stop of the audio tour. (Wißmann, 2009, p. 5 – translated from German)

Producing content that includes a narrator's voice, music, jingles to signify tour breaks, audio citations from movies, snippets from interviews with experts, and historic audio material cannot be accomplished by just setting up a voicemail box. All relevant soundtracks have to be evaluated first and put together via a high-end audio recording process. All three audio tours are produced in a sound studio especially set up for the purpose of providing students with the best acoustic experience possible (Deubel, 2007). An Audio Technica 4040 cardioid condenser microphone is used in combination with the Yamaha USB Mixing Studio MW10c to digitally connect to a MacBook Pro running Garageband software. The set-up is easy to use so any tutor can use it after a brief training session.

The narrator's text is prewritten and integrated into a storyboard that also contains information about the recording process, like the number of simultaneous audio tracks or speaking instructions. Before recording starts, all sound samples are collected and arranged in podcasting software (Wißmann, 2008a). Podcasting technology is crucial for recording as it displays the narrator's script, allows tracks to be mixed simultaneously, offers the possibility to edit and do other postproduction work, and also includes various options for distribution, all within a single piece of software (IDG Global Solutions and Apple European Education Team, 2006; Mitchell, 2006; Molina, 2006). After the raw audio material is recorded and mixed into the final version, it has to be exported for download. Different formats of the audio files are offered to fit every student's technological equipment. The basic version is distributed in mp3 format, while the enhanced version comes in a single sound file for each audio tour. Audio chapters are integrated into the file so that each stop of the tour is easy to access. Additional maps can be viewed in the displays of more advanced audio players. But regardless of which version he/she needs, each student can download the audio material from a secure website that assures only registered persons can download the files.

Workbook – maps – posters

Additional material is needed in order for the audio tour to be an effective teaching tool. Even if it were possible to trace that every student had downloaded the audio files onto his/her individual player, the lecturer could never be sure that the recording had actually been played on each device. Therefore, to stimulate and challenge students, every audio tour comes with a workbook and map. The need for a thematic map that shows the route and contains all stopping points is obvious. But the workbook goes further than merely accompanying the audio files (see Figure 2) by helping students engage actively in the field trip. For each stop a header in the workbook contains the name of the city and a stop number that matches the one in the map. Titles delineate each location, such as *Citadel* or *Roman Theater*. A large-scale map shows in detail where exactly to listen to the audio material. Provided with this basic information, students must fill in the date and time of their visit. For the enhanced version (see above), a time code shows the exact length of each stop's audio content. The next two sections in the workbook contain special work

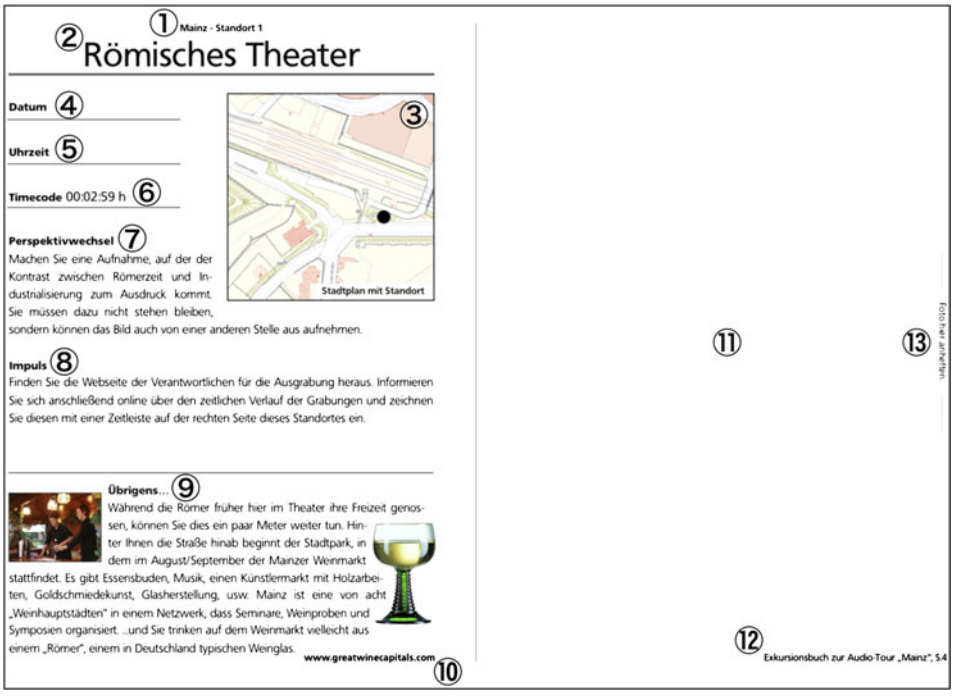

Figure 2. Workbook, audio tour 1: settlement geography, Mainz. 1, title of the audio tour and number of stop; 2, title of stop; 3, city map with location of stop; 4, date of visit; 5, time of visit; 6, time code; 7, perspektivwechsel (changing perspective); 8, impuls (impulse); 9, übrigens (by the way); 10, hyperlinks; 11, notes; 12, footer; 13, attach picture.

tasks. *Perspektivwechsel* (changing perspective) asks the student to take a photo that he/she later has to print out and attach to the workbook. These pictures not only verify that each student made it to each stop, but also act as proof that the student gained some geographical knowledge:

> Capture at least one contemporary reuse of Vauban's fortification system on your way to the next stopping point. You are free to take even two or three pictures if you can spot more than one example. (Wißmann, 2009, p. 8 – translated from German)

Some of the photography assignments aim to cultivate creative thinking by asking for more than a snapshot. Students are motivated to think outside the box and individually solve a given problem. An example of this is the assignment for the Hospice stop:

> Capture 'frailty' at this stopping point. What kind of 'frailty' you choose is up to you. (Wißmann, 2009, p. 24 – translated from German)

Thus, they become acquainted with scientific thinking that approaches an object of investigation from various perspectives.

Empirical methods are the focus of the *Impuls* (impulse) section. Here, students get hands-on experience with empirical field work by mapping the forecourt of a train station, drawing baroque bastions on a current map, sketching the framework of a fifteenth-century house, searching that day's newspaper for geographically relevant articles, or interviewing pedestrians about postwar architecture. On the workbook's right-hand pages all information gathered at each stop has to be written down, sketched, or glued in place. Again, critical thinking is more important than fulfilling the work task. At stopping point

18 of the audio tour, Mainz students sit down in a coffee bar and scan the local newspaper for topics relevant for settlement geography. Doing so, they learn how to read and evaluate daily news by applying their geographic background knowledge. Stopping point 9 of the audio tour Wiesbaden investigates the impact of local politics on social life. The related *Impuls* asks students to write down how political power is expressed through the building itself and through the location of the state parliament. "Try to describe in detail how, in your opinion, power manifests itself in this place" (Wißmann, 2011, p. 20 – translated from German). The topic of contemporary state politics is used to encourage students to think about its social meaning and related effects on city planning.

To motivate students even more, the workbook's *Übrigens* (by the way) section provides less-scientific background information about each location – e.g., major soccer teams, live music concerts, wine markets, or other cultural activities – adding an element of fun to the audio tour. If students still want to know more about a stopping point, the addresses of relevant websites can be found on the according page of the workbook.

Descriptions of stopping points make up the major part of the workbook. In addition, some introductory pages explain how to use and handle the audio tour. A large appendix contains a full bibliography of all texts used in the workbook and audio files. Finally, various maps help illustrate the teaching content, and a questionnaire on the last page gives students the opportunity to give their feedback.

After completing all three audio tours, students will have a workbook full of information, notes, sketches, drawings, and pictures that document their reflective fieldwork (Dummer, Cook, Parker, Barrett, & Hull, 2008). The photos must also be used to create a digital collage that shows each student's individual impression of the field trip. With *Globalization* as the main topic, the collage requires the critical examination of a geographic topic in addition to the creative process of arranging the photos in a meaningful order. Thus, before a student takes a picture on the field trip, he/she must consider at least two aspects: significance in matters of the stopping point's topic and relevance to the globalization theme. "[S]tudents are likely to learn and retain more from their experience if they are involved in a participatory rather than a submissive role" (Mossa, 1995, p. 83). The best collage of the year is printed and presented to the public on the department's poster wall. This incentive follows the idea that students put more energy into learning if they are able to create something on their own (Jenkins & Pepper, 1988), as the aforementioned examples of student-led fieldwork and podcasting have shown (Brittain et al., 2006; Chan & Lee, 2005; Meyer & Postlethwait, 1970).

Implementation

The three audio tours described above are part of the bachelor's curriculum in geography at JGU and focus on human geographic topics. The audio tours are not stand-alone experiences that would work without the fundamental knowledge students gain in preceding classes. To ensure that the narrator in the student's ear is not talking about something totally new, the audio tour module is set to take place after their first academic year, by which time they have already learned theories about settlement patterns, social and economic geography. Also in the first year there are modules to cover empirical methods and cartography, both of which are crucial for the audio tours' successful use.

Before adding the audio tours to the curriculum, in 2009 a test run was performed by 201 students. They were asked to first take the tour and then provide feedback in a short questionnaire, where 66% answered that they *liked* or *very much liked* the content. However, 54% had major technical and other problems. Most students had to endlessly

fast-forward the one large audio file because many audio players were not capable of staying in pause mode between stopping points. The now-available basic version of the audio tours solved this issue by additionally supplying single audio files for each stopping point. An easier-to-understand map was created in response to earlier problems of map readability, named the second most common difficulty. The pretest also showed the need for an introductory class to teach students how to use the workbook and explain the benefits of categories such as *Perspektivwechsel* (changing perspective). With the changes made all the mentioned problems could be eliminated, except for individual students' difficulties in comprehending the learning content as well as technical issues like battery life or the handling of the audio player.

The analysis of a questionnaire handed out to five cohorts (536 students) between 2009 and 2011 showed that the number of students experiencing problems decreased from 54% in the first test run to 25% in the most recent version of the audio tour. Today in geography at JGU, the overall concept of audio tours is widely accepted. Figure 3 shows that the number of students rating the concept negatively (6%) is marginal in comparison with 69% positive responses. The major reason for students to request more audio tours is *Flexibility* (30%), followed by a positive *Learning Effect* (22%), and *Independence* (17%). Among other answers, *Fun* (12%), the tours being *Interesting* (9%), and a most welcome *Change* to traditional field trips (4%) are also an issue (see Figure 4). In addition to the quantitative results, the following quote and the students' statements in Figure 5 illustrate the high-learning effect of the audio tours. Since traditionally guided 1-day field trips have already been repealed from the current curriculum, no student is able to directly compare both types of excursions. As the quotes indicate, the learning effect and activation might at most be matched in traditional tours but could not be higher:

> In my opinion, the interactive learning concept of the audio tours is a kick-ass method for knowledge transfer. (Student quote – translated from German)

Equipped with the knowledge needed to start the audio tours, the module's introductory class is held at the end of the summer term. During this session, students learn the basic principles of audio tours. General information is given concerning the use of the audio player, the locations at which to download audio files, and the make-up of maps and workbooks. Explaining the workbook's purpose is extremely important, for not every

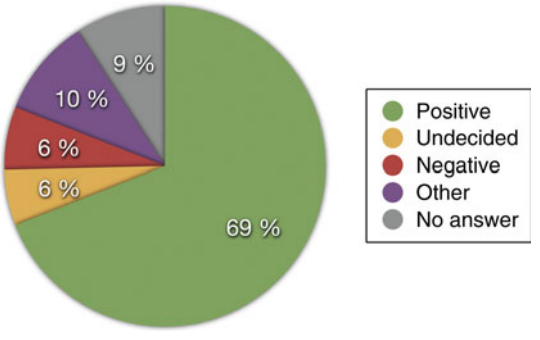

Figure 3. How do you rate the audio tour concept? ($n = 536$).

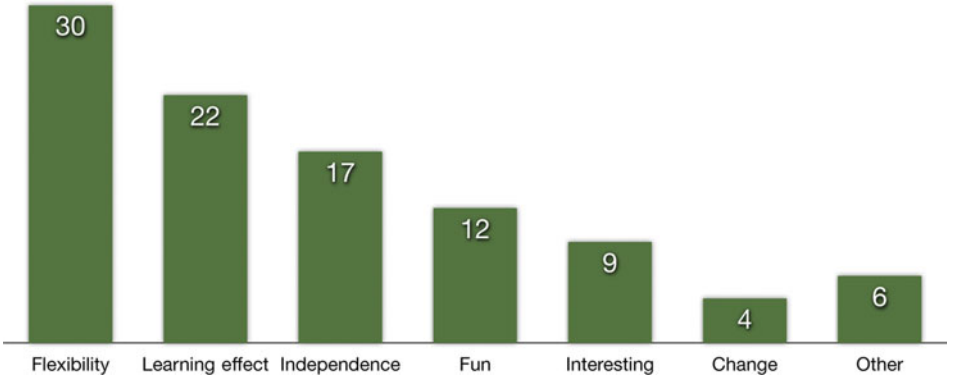

Figure 4. Why would you like to have more audio tours? (in %, $n = 162$).

student will understand why he/she should take a picture that shows frailty, for example. Students are also asked to refresh their knowledge of empirical methods and are advised to reacquaint themselves with any teaching content if necessary. Finally, maps and workbooks are handed out to the students so that they can start their tours at any time. The price for the workbook, map, and audio files is included in the student fee for the audio tours, which is the same as that for other 1-day excursions at the department. If students do not own an appropriate audio player, devices can be borrowed from the department for free. In the field, the vast majority of stopping points are wheelchair accessible. Wherever wheelchair-bound students cannot reach the recommended location, alternative locations are given. Thus by listening to the track in a different spot, the learning effect is not affected.

Over the months of summer break, students can pick their preferred days to complete the field trips. No matter when they decide to start, the university's health insurance covers them. The only requirement is that students stay on the default route and take the bus, train, or walk from one stopping point to the next as marked on the map. Starting with the tour in Mainz, empirical impulses are very basic and thus designed to get the students started. As the students proceed with the following audio tours (Wiesbaden and Frankfurt), work tasks get more complicated. In the last audio tour, students often choose proper empirical methods by themselves. Whenever questions arise, the lecturer can be contacted for advice, although direct questioning on the spot is not possible. This is probably the chief downside of audio tours, which can only partly be compensated by one-on-one talks with the lecturer (see below). If students decide to take the tour in small groups, they can at least discuss problems among each other on the way. After completing all three audio tours, each student has to fill their workbook with notes and pictures before handing it over to the lecturer at the end of summer break. Thus the lecturer receives a large number of workbooks and poster suggestions he/she has to grade and afterwards discuss with each student individually at open office hours. To make grading easier, each lecturer is provided with a special lecturer's workbook that contains all answers and extra information about each stopping point. Inspecting students' workbooks gives insight into individual students' progress and difficulties. In one-on-one talks, lecturers and students go over all three tours together for feedback, advice, and transparency of grading.

In my opinion, audio tours are great, because you learn more about the learning matter, the format asks for one‘s own initiative, and it addresses topics that I find really interesting.

Working independently is much better, so I prefer the format of an audio-tour.

In my opinion, audio tours are an amazing alternative, especially for freshman students, to get familiar with geography and learn how to read maps.

What I really loved was my independent research project during the tour.

I really like the format of audio tours because I can plan everything on my own. It simply gives me more time to get to know a city better.

For me, the audio tours have a high learning effect. They area totally different way to explore a city.

Absolute highlight of the audio tours were all the stopping points where I could live out my creativity -- e.g. by taking photos.

Figure 5. Students' evaluation of the learning effect of the audio tours.

Each student's workload consists of classroom time, individual study, the field trips, and one-on-one talks with the lecturer. This adds up to 240 h, or eight credit points, split between summer and winter terms. As for the lecturer, workbook grading for all three audio tours is comparable to grading one first-year paper. Because the lecturer does not participate in the field trips and the learning content has already been covered by preceding modules, he/she can spend most of his/her time focusing on one-on-one mentoring. Individual discussions help recap not only settlement, social, and economic geography but also mapping and empirical methods. Thus, the audio tour interlinks with eight other seminars and lectures.

The implementation of the audio tour module not only has an effect on 1-day field trips but also restructures all introductory classes in human geography. Before the audio tours were set in place, each lecturer of settlement, social, and economic geography had to conduct a field trip for every class taught. Abolishing field trips attached to this seminar sets free additional time for individual mentoring, a huge plus for the teaching situation as a whole.

Students who successfully pass the field trip module have gained insights into the use of audio tours that they can make use of in the following Master of Arts program. Media geography is one of the program's key issues: in addition to media theory and empirical analysis, students learn how to use media to produce geographic content. In a module called *Geographische Dokumentation* (geographic documentation), fieldwork is completely student-led, and methods include video as well as audio production. The previously gathered knowledge about audio tours inspires students to work with sound and produce audio content independently.

Conclusion

In a time when "designing effective fieldwork is increasingly problematic" (Stokes, Magnier, & Weaver, 2011, p. 122), the implementation of audio tours as a replacement for 1-day excursions in urban geography provides a large number of benefits for both learning and teaching (see Bradbeer, 1996; Brittain et al., 2006; Chan & Lee, 2005; Herrick, 2010; Higgitt, 1996). The lecturer's voice is no longer obscured by traffic noise and other urban sounds such as music or pedestrians' conversations. The problem of sonic cacophony is solved by the use of earphones; and listening to the lecturer is no longer a passive act. Students are actively engaged in the field trip and are responsible for following each route and finding all stopping points on their own (Fuller et al., 2006; Jarvis & Dickie, 2010). Exercises in empirical methods add another active aspect missing in 1-day field trips. Conducting interviews, drawing and sketching, taking notes, and analyzing research material such as the daily newspaper help prepare students for their future research and for their bachelor theses or even postgraduate studies. One key to successful empirical research lies in the kind of extensive practice that the audio tours provide at every one of the more than 90 stopping points. With audio tours, students get used to taking notes in the field, thinking creatively, and applying their geographic knowledge.

Giving students the opportunity to decide on their own, the schedule and pace of their tours serves two purposes (Bradbeer, 1996). First, it promotes individualization; second, it aids in learning, as students can use the exact amount of time they need to really internalize a certain topic. Thus, the content is less likely to be forgotten. Individual debriefing supports this aim, too (Herrick, 2010; Kent et al., 1997), although instant feedback in the field is missing. Lecturers can now focus more on mentoring than on leading group after group from A to B through the urban environment. Colleagues teaching introductory seminars also gain time to deal with students individually (Bradbeer, 1996). Furthermore, follow-up classes, such as excursions of several days duration, will benefit from students knowing how to use their tools. Positive effects are also seen for the Master of Arts program, wherein student-led audio tours can be produced for a class on geographic documentation.

Overall, audio tours have tremendously improved both teaching and learning within bachelor students' first academic year in human geography at JGU. Audio tours help train empirical researchers to understand not only human geographic theory but also how to use their methods in the field (Maskall et al., 2007) and eventually stop listening to the voices in their ears.

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