



## Active Transportation in Netherlands and Germany

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## **Active Transportation in Netherlands and Germany**

## **ABSTRACT**

A pilot, short-term study abroad program on active transportation was offered to upper level undergraduate students and graduate students, focusing on civil engineering majors. The course took students to the Netherlands and Germany after some introductory coursework at the home institution. There are opportunities, challenges and risks in developing and executing the course. Two opportunities include enabling the course leaders to develop international contacts and to introduce students to a specific topic that would otherwise be difficult to offer in a traditional engineering course curriculum. Challenges include balancing the time used for instruction with allowing time for students to independently experience the culture of the host county, minimizing costs, and scheduling the course to fit into a student's academic and the professional staff's schedules. Risks include maintaining the budget and prior knowledge of the host location. Finally, a survey was distributed to evaluate the impact of achieving the learning objectives for the course. The findings indicate that the course had an impact on student achievement of the learning outcomes.

## **INTRODUCTION**

The course, Active Transportation Netherlands and Germany, was offered to students in May of 2014. Active Transportation Netherlands and Germany was a faculty-led, short-term study abroad program, also termed as a sojourn. The course was developed by professional staff to provide opportunities for students to gain international insights into the policies and infrastructure for active transportation modes (such as bicycles and pedestrians). The Netherlands and Germany were chosen because of their novel approach to policies and infrastructure associated with active transportation.

The course offered students three credit hours. The course content was delivered in English, although outside of class experiences, students were exposed to the Dutch and German languages. The Dutch have a very thorough understanding of English, although very subtle cultural differences can affect the translation. While the Germans are known to be relatively fluent in English, participants encountered a larger number of German-only speakers as compared with Dutch-only speakers.

The timing of the course started on the Monday immediately after the Spring semester concluded. There were thirteen total days of instruction and three travel days. The first four days of the course were held at the home university. Over the next two days, participants travelled to Utrecht, Netherlands, taking into account the time change. The following six days of the course were held in the Netherlands at various locations near Utrecht, where the students stayed while in the Netherlands. The next day was a travel day from Utrecht to Freiburg, Germany, and the final three days were held in Freiburg.

The course was targeted to upper level undergraduate students and graduate students due to the specialized nature of the material. In particular, the course was designed for civil engineering students; however, the course was also open to those studying urban planning, policy, and health sciences. A total of five students participated in the pilot program, the majority of which were civil engineering majors. Students were graded based on their participation and final report.

This paper will provide the reader with insight into the process of developing a pilot short-term study abroad course. Some of the lessons learned may provide guidance to faculty or professional staff at other institutions who are developing their own short-term study abroad courses.

The primary instructor of the course attended a university for her undergraduate education that had a large, well-developed study abroad program, which offered many opportunities for participating, even as an engineering student. In comparison, the current institution at which she works has less experience in offering study abroad courses.

## **LITERATURE REVIEW**

The literature reviewed herein is not exhaustive in all of the discussion related to short-term study abroad programs, particularly those that focus on engineering. Rather, the selected studies present concepts or ideas that tie in to the findings or recommendations as a result of the course described herein.

### ***Non-Engineering***

In 2005, Lewis and Niesenbaum (1) focused on the benefits of short-term study abroad programs. The programs that they discussed were not specifically directed at engineers. Lewis and Niesenbaum indicated that they found the primary benefits to be “acquisition of a foreign language, improve their knowledge of the host culture, and even transform their worldviews.” They found that approximately half of the students that participated in their programs studied abroad again. More interestingly, they indicated that while many have argued that short-term study abroad programs do not provide as significant of benefits as longer programs, they have found that “shorter, well-planned programs” can achieve the same goals as longer programs.

In 2007, Stanitski and Fuellhart (2) provided recommendations for faculty at other institutions interested in developing short-term study abroad courses for geographic studies. They highlighted the need to integrate the offered study abroad courses into the overall geography curriculum. They highlight the primary issues associated with course development as course content, scheduling, integration into the department curriculum and cost. They highlight that the development costs, particularly the time for development of them, are borne by faculty. They identify two approaches to course development: curriculum-lead and place-lead. Two recommendations provided by Stanitski and Fuellhart are to overestimate on costs and require that students keep a journal. The latter will help students to reflect on their experiences, which they describe as far more challenging than developing activities. The results of surveys conducted by Stanitski and Fuellhart led them to change the format of their trip to Australia to allow for more unstructured time. They indicate that it is a significant benefit to have personal international contacts. One aspect of scheduling that they highlight is the need to understand how the schedule may affect summer employment opportunities for students. They found that identifying accommodations is an important challenge. They have found that many students have not previously traveled extensively, in fact, some have never flown.

In 2011, Lumkes et al. (3) evaluated the impact on learning outcomes of a short-term study abroad course for agricultural students. They administered surveys to students after the domestic portion and international portion of the course using a five point Likert scale (i.e. 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree). Researchers employed a two-tailed T-test on the thirteen surveys from which data was collected. They found the most significant changes in a student's cultural sensitivity and personal development, whereas less notable changes were found regarding knowledge of course content. It is unclear why the authors did not administer the survey prior to the domestic portion, which may have resulted in findings of change in the student's knowledge of the course materials; however, it may have been related to the format in which the survey questions were developed.

### ***Engineering***

In 2007, Parkinson (4) surveyed approximately 25 engineering study abroad programs. He identified nine program formats. The one which best described the program described herein is mentored travel. Mentored travel according to Parkinson is under the guidance of a faculty member for four or more weeks. Students stay together as a group. When considering the programs offered from a broader perspective than just each study abroad program, he identified several challenges including 1) scaling, 2) the fact that most United States students are not bilingual, 3) that few engineering students are interested in studying abroad, 4) that faculty perceive such programs to be a lot of work, and 5) that programs are not assessed. Interesting points that Parkinson made include that while it is appealing to have students become fluent in another language, requiring fluency may dissuade students from participating, particularly engineering students. In addition, he highlights the need to emphasize to students that a study abroad experience is critical to their education, not just 'nice.' Mentored student experiences were identified as being those which typically scaled the best. He indicated that donors have a keen interest to support study abroad experiences. In addition, he emphasized that offering such experiences could help to encourage the enrollment of women in engineering and technology programs, as they found that on average, women make up twenty-five percent of participants. As a comparison, the percentage of women receiving bachelor's degrees in engineering in a 2011 review was approximately 18 percent and it was anticipated to remain at that level (5).

In 2012, Olson and Lalley (6) evaluated a short-term, first-year study abroad program offered at the University of Pittsburg aimed at business and engineering students in influencing students to pursue future study abroad and international internship opportunities, subsequently study foreign language courses, and participate in international activities. To understand if the goals of the program were met, they surveyed students who participated in the program two to three years later. There were no language requirements for participating in the program. The program was divided into three components: pre-trip classes totaling twelve hours including a survival language class, a two-week trip to the chosen country, and writing a research paper once returning from the trip. While they found that there were many statistical differences between participation in subsequent study abroad programs and language courses when comparing business students to engineering students, there was not a statistically significant different finding in engagement in international activities. While the authors themselves did not propose

that it was associated with the rigor of the engineering curriculum, this author suggests that this is potentially the case. The difference in graduation rate that was discussed in the paper (100% vs. 43%) hints that this could be the case. In fact, the authors highlighted anecdotal evidence that engineering students participated in the program because they were afraid that they would be too busy with cooperative education to participate in other study abroad programs. The authors concluded that the short-term study abroad program contributed to “transformative learning” of program participants.

A dissertation by Kernaghan (7) in 2012 investigated the benefits and challenges of engineering students, particularly those at a graduate level, participating in study abroad experiences. Her dissertation focused on short-term, faculty-led study abroad courses. Her review of the literature on the topic brought out some relevant concerns related to the discussion within this paper. Kernaghan identified one reason for why engineering students do not study abroad as: “lack of recognition of the value of study abroad experiences in the science and engineering disciplines by students, their families, and science and engineering faculty.” This could be in part because there are a limited number of studies that provide recommendations related to the design, implementation and evaluation of effective engineering study abroad programs. Another explanation for the lack of participation identified in her literature review is cost. However, she noted that the Accreditation Board for Engineering and Technology supports study abroad experiences because they assist students with developing the “soft skills needed to function in multidisciplinary teams.” One of the challenges that she identified was that very few study abroad program opportunities exist in engineering disciplines. This could be in part because faculty believe that their work on study abroad programs does not support advancement or tenure. Short-term study abroad programs are appealing to a large number of students because they are often easier to fit into one’s course of study; however, long-term study abroad programs are typically thought to “achieve more desirable outcomes.”

## **OPPORTUNITIES**

Two opportunities will be highlighted in this section: the benefits of engaging guest speakers and the use of study abroad courses to offer specialized coursework.

Study abroad courses can be designed so that the faculty leading the program does all of the presenting, or so there is a mix of presentations from the faculty leading the program and from guest speakers of the host country. For the study abroad course discussed here, the course was designed to offer both faculty presented lectures and guest speakers. There are many benefits of using this approach, including presenting students with the most current information and allowing course designers to develop contacts within the country of study. These contacts can potentially be considered for future research collaborations, although it is difficult to identify funding sources that span international borders. Related to this particular course, the author partnered with the new contacts to develop papers on topics of interest to researchers and practitioners in the United States.

Civil engineering course curriculums have many required courses that afford little room for more specialized information. Therefore, a significant benefit of this course is that it allows students

to be exposed to materials that would not fall within the standard curriculum. Furthermore, the information presented is expected to be retained at a higher level according to experiential learning.

## **CHALLENGES**

Three challenges will be discussed in this section: balancing contact hours with cultural exploration, the high costs of traveling in Europe, and course timing.

In a typical school setting, students are responsible for their activities and behavior outside of course hours. However, during a short-term study abroad course, the instructor is expected to serve as a resource to students outside of the normal course hours. Therefore, it is appealing to plan coursework to ensure that the students stay busy for a longer period of time. This also ensures that the number of contact hours can be achieved based on the number of credit hours offered with the course. At the same time, a balance needs to be achieved to allow some independent exploration of the host country, as this contributes to the students' cultural experience. For this particular course, there was an elevated concern regarding student supervision because the Netherlands does not restrict the use of some recreational drugs. The policy of the university is for a student to adhere to university policy abroad even though there are not restrictions in the host country.

Students learned very quickly that Europe is expensive, particularly because the exchange rates were not favorable for U.S. visitors at the time the course was offered. When advertising the course, food was identified as being "on their own," except for the arrival and departure dinners. In the Netherlands, breakfast was included with the hotel stay (although this was not identified as included during course registration). Therefore, the costs of all meals in Germany and of lunches and dinners in the Netherlands were not included in the course fee. Additionally, costs for travel from the hotel to the train station were not originally included as students were expected to choose whether they wanted to walk or take transit. However, as costs were finalized, there was room in the final budget to pay for some of the transportation costs from the hotel to the train station to reduce the amount of travel time. Students expressed disappointment that more meals were not included. Therefore, it is recommended that a faculty member designing a course be very clear about what meals are and are not included. However, it should be noted that students were more willing to spend their money on food and drink while socializing in the evening. Therefore, there is a bit of a bias regarding what students are willing to pay for.

A short-term course like this one, which is offered after the Spring semester and before the Summer semester begins, provides students with opportunities to learn more specialized information, and to travel and learn abroad, while still allowing them to return for summer coursework or an internship. The author was particularly interested in offering a course with this structure because of the ease of participating in similar courses during her undergraduate education as an engineering student. Since a primary goal of the course was to attract civil engineering students, it was expected that this schedule would be appealing.

Since the course was a new offering, it went through a departmental review. Approval was required in order to offer students civil engineering credits. While the department was generally

receptive to the idea, there were still some reservations to categorizing it as a civil engineering course. This response is not unusual, as the literature review discussed the challenges that engineering students have in conveying the value of study abroad programs to friends, family, and faculty. However, the author was able to provide the department with two examples where a similar course was offered at other universities. This helped to gain approval for offering this course for credit within the civil engineering department.

## **RISKS**

There are two primary risks associated with the course: creating the budget and developing courses from afar.

The budget of the course is highly variable. Part of the variability can be attributed to the exchange rate and costs of having to change the currency from the dollar to the Euro. Furthermore, until the size of the class can be determined, it is difficult to book lodging. The longer one waits to book lodging, the more difficult it becomes to find cost-effective lodging. This must be balanced with recruiting students for the course. There are certain times of the year during which students are looking for study abroad opportunities. Therefore, the deadlines for interest must be soon enough to allow sufficient time to identify the correct size of housing while late enough to allow students to return to school and look for study abroad opportunities. The easiest cost variable to control is the one associated with compensation for faculty. Therefore, while a desirable amount was originally included, this amount was significantly reduced as other costs were identified and increased, resulting in an unfortunate impact on compensation for participating professional staff. For some faculty, this may or may not be a deciding factor in their willingness to participate. However, it was a significant financial challenge for the professional staff members who helped to develop and lead this course.

While planning for this course, the course leader contacted leaders of trips in which she had participated. It was identified that faculty of those courses had not always traveled to the destination of the course prior to taking students there. For this particular course, there were two locations where the students were taken: the Netherlands and Germany. The course leader had firsthand experience using and researching active transportation modes in the Netherlands, and was therefore able to develop the relevant course components, which accounted for the largest portion of the course. In contrast, the portion of the course that was in Germany was not investigated in person in advance of the course. Organizers followed two different approaches for securing guest speakers in each of these countries. For the Netherlands, speakers were identified without cost to the course by coordinating “Information Exchanges” with universities. In Germany, in contrast, a portion of the course fees paid for the speakers. For both locations, the leader spent a large amount of time researching information by consulting colleagues who were knowledgeable in the area, journal articles, and numerous books. A decision was made to travel to both the Netherlands and Germany for the pilot course with the expectation that if the costs of traveling to Germany were too high, this portion of the course might be eliminated for future course offerings.



## **SURVEY FOR EVALUATION**

Because the course was a pilot, there was an interest to better understand the whether the course's learning objectives were achieved. The author had seen a before and after survey similar to the one discussed here employed for other short-term study abroad courses, like the one discussed by Lumkes et al. (3) in the Literature Review section. Therefore, a survey was developed and administered to the students before the start of the course and at the end of the course. Students were asked to not include their name on the survey. Furthermore, students only had to make "X's" in the boxes of their choice, which allows as much anonymity as could be provided while still having the course leader present during the survey. Students were told that the responses had no bearing on their grade. The results imply that there is value to the manner in which this survey was deployed because all students did not put a 1 for each response in the "before" survey and a 5 for each response in the "after" survey. Considering that only a small number of students participated in the course, it would have been difficult to understand the impacts of the course without interviewing each student in-depth. Therefore, there is value to information presented here.

For the survey, questions were crafted based on the four course learning outcomes:

- Describe the influence of planning, infrastructure, policy, and culture on active transportation in The Netherlands, Germany and the United States,
- Compare how differences in the built environment, policy, and culture affect active transportation modes in The Netherlands, Germany and the United States,
- Appreciate the cultures and languages of The Netherlands and Germany, and
- Recognize and explain the legitimacy of active transportation modes in creating balanced transportation systems.

From these intended outcomes, the course leader developed twelve questions:

- 1) I feel I have a basic understanding of the Dutch culture.
- 2) I feel I have a basic understanding of the Dutch language.
- 3) I feel I have a basic understanding of the German culture.
- 4) I feel I have a basic understanding of the German language.
- 5) I understand how walking, bicycling and transit contribute to a balanced transportation system.
- 6) I understand the differences between the built environment on the use of active transportation in the U.S., the Netherlands and Germany.
- 7) I understand the differences between the policies related to active transportation of the U.S., the Netherlands, and Germany.
- 8) I understand how differences in the Dutch, German, and the U.S. cultures affect the use of active transportation.
- 9) I can describe how planning influences active transportation in the Netherlands, Germany, and the U.S.
- 10) I can describe how infrastructure influences active transportation in the Netherlands, Germany and the U.S.

- 11) I can describe how policy influences active transportation in the Netherlands, Germany and the U.S.
- 12) I can describe how culture influences active transportation in the Netherlands, Germany, and the U.S.

Students were given a five point Likert scale, with 5 being “complete agreement” and 1 being “complete disagreement.” The Appendix contains the instrument presented to students. Figure 1 below shows the average value for the responses to each question when the surveys were given before the start of the course and at the conclusion of the course.

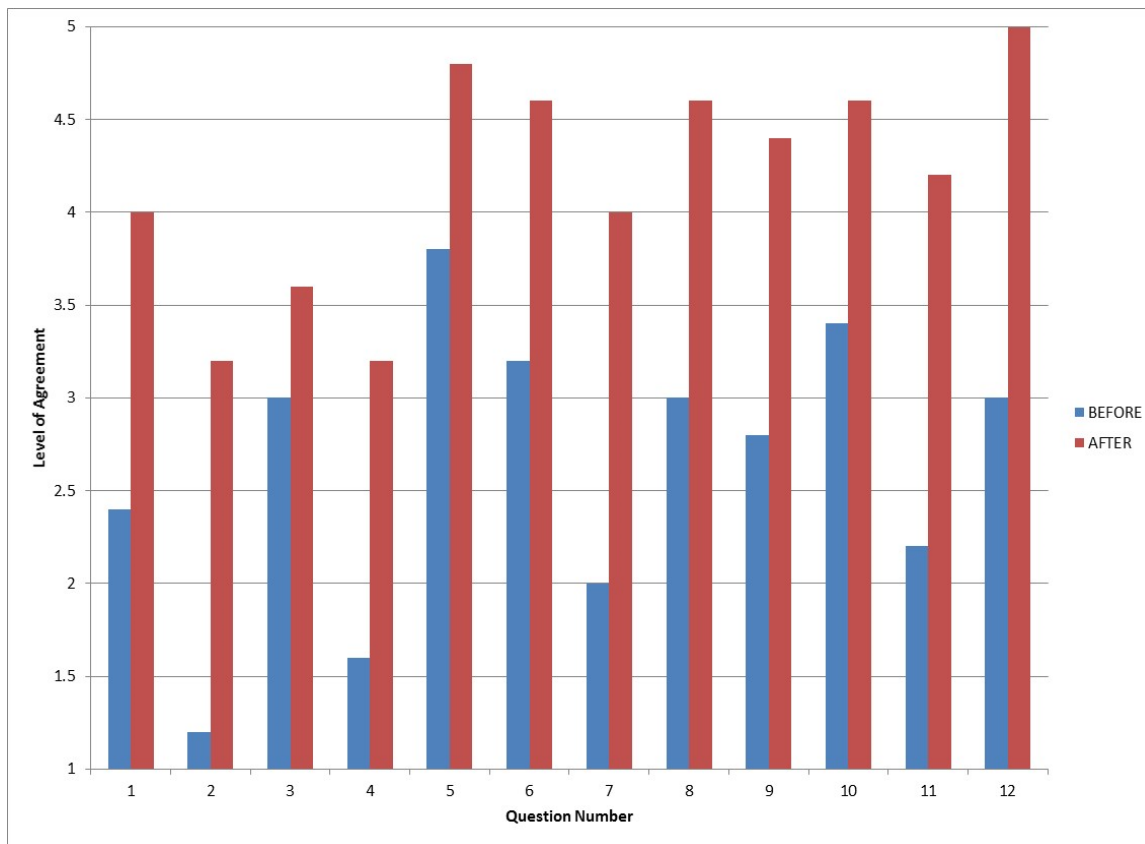


Figure 1: Average Value for Question Response

The results show that the course had a positive impact on all the learning outcomes of the course. However, there were significant differences in the amount of average change for each question. This suggests that the responses can provide some insight into which components of the course had more impact on the students’ learning than others.

For example, the first and the third question asked the students how well they understood the Dutch and German culture, respectively. The results indicate that the course provided the students with a better understanding of the Dutch culture as compared with the German culture. This is expected as a larger amount of time was spent in the Netherlands as compared to

Germany. However, it is also possible that the students felt that they already had a better understanding of the German culture as compared with the Dutch culture.

The second and fourth question addressed the students' understanding of the two languages. While in the United States, a portion of the class time was spent teaching students some basic words in Dutch and German. While abroad, a brief amount of time was spent discussing some of the words in Dutch and German. Furthermore, students took it upon themselves to discuss a "word of the day" during breakfast. This was clearly evident while in the Netherlands where the free breakfast allowed students to sit together and chat while they were eating breakfast. The students did not know any Dutch prior to the trip; however, there was some understanding of German. Therefore, the results regarding language development are in line with expectations of student learning.

The remaining questions are more specifically tied to a student's understanding of active transportation, the focus of the course. Questions seven, eleven and twelve (which address policy and culture issues) saw the largest before and after change. Considering that the majority of the students were engineers, who are not typically exposed to policy discussions, seeing a significant change in understanding on these issues is not unexpected. In contrast, there was a less significant change in responses to questions related to a student's understanding of the differences in infrastructure.

In reviewing the results of the survey, while acknowledging the limitations of the methodology, the professional staff concluded that the course had an impact on student achievement of the learning outcomes.

## **CONCLUSIONS**

The course, Active Transportation Netherlands and Germany, was offered for the first time to students in May of 2014. It was a short-term, faculty-led study abroad course. While there were risks and challenges associated with offering the course, there were opportunities as well. In addition, the survey that was presented to students at the beginning and end of the course, provided results indicating that the learning outcomes that the course was designed to fulfill were satisfied.

Many evaluations of study abroad courses focus on the benefits of participation on a student's knowledge of the host culture and acquisition of a foreign language. However, many overlook the benefits that a study abroad course can offer with respect to technical education. In civil engineering, particularly in the transportation area, many times, innovations, like cable barriers and roundabouts, come from overseas. Therefore, while the cultural component cannot be overlooked, the author purports that further understanding technical benefits that can come from study abroad opportunities, particularly short-term, can help to encourage increased participation by engineers and support by engineering faculty and departments. The questions posted within the survey, which were based off of the learning outcomes for the class lend support to conclude that there are technical benefits of a short-term study abroad course such as that presented herein.

How do we define success? What kind of change do we need to see to conclude that there was a cultural impact to student participants? The survey discussed herein showed that there was an average change of the student's understanding of the Dutch and German cultures. Lewis and Niesenbaum asserted that shorter programs can achieve some goals of longer programs. The results from the survey provide a basic support from this perspective, acknowledging the drawbacks of this metric.

Parkinson identified the lack of student interest as a challenge to offering study abroad programs to engineering students. While the author has to acknowledge the limited number of participants, there is an expectation that over time, more students would likely become interested as word gets around from students. Parkinson indicated that some of the best advertising for study abroad programs are past student participants; therefore, it will be seen as to the interest over time in a program such as this one.

Of course, another program challenge that Parkinson and Stanitski and Fuelhard identified was continued interest in faculty running such a course due to the time intensive nature of program development. At present, the program is set to run again in 2015; however, it is anticipated that the manner in which is executed will change.

A concern for many engineering programs is to ensure a large enough representation by women. Parkinson indicated that at least twenty-five percent of study abroad enrollment are women. The majority of participants in this particular course far exceeded that percentage. Furthermore, the trip leaders were all women. Therefore, offering programs, such as the one described herein, can be seen as a way to further encourage enrollment in engineering courses by women.

Stanitski and Fuelhart and Olson and Lalley both identified challenges of participation by engineering students as a result of scheduling conflicts. As discussed in the body of the paper, the timing of the course was considered carefully. The intent was to balance the length of the program so an appropriate number of credits could be earned with the timing of summer courses and the possibility of participating in internships after the course. From general feedback, participants seemed to be receptive of the timing, but there is always the possibility that some students did not participate due to the timing.

The literature reviewed indicated that cost was a serious concern for students (Stanitski and Fuelhart; Kernaghan). This was also highlighted to the instructors from participants. However, from the author's perspective, it seems to be a bit of a challenge with providing students with information about the real costs of travel to Europe. These expenses are not cheap. Furthermore, considering the credits awarded through the class, and the amount of time and effort spent by the instructors in developing the course, the cost was affordable. As mentioned by Parkinson, identifying donors which may be interested in supporting such experiences, could help to alleviate costs. Also, educating students on the value that they are receiving could go a long way on changing perceptions.

## APPENDIX

Please select the number which best represents your response to the following questions, where 5 indicates complete agreement and 1 represents complete disagreement.

Questions	5 (complete agreement)	4	3 (neutral)	2	1 (complete disagreement)
1. I feel I have a basic understanding of the Dutch culture.					
2. I feel I have a basic understanding of the Dutch language.					
3. I feel I have a basic understanding of the German culture.					
4. I feel I have a basic understanding of the German language.					
5. I understand how walking, bicycling and transit contribute to a balanced transportation system.					
6. I understand the differences between the built environment on the use of active transportation in the U.S., the Netherlands, and Germany.					
7. I understand the differences between the policies related to active transportation of the U.S., the Netherlands, and Germany.					
8. I understand how differences in the Dutch, German, and the U.S. cultures affect the use of active transportation.					
9. I can describe how planning influences active transportation in the Netherlands, Germany, and the U.S.					
10. I can describe how infrastructure influences active transportation in the Netherlands, Germany, and the U.S.					
11. I can describe how policy influences active transportation in the Netherlands, Germany, and the U.S.					
12. I can describe how culture influences active transportation in the Netherlands, Germany, and the U.S.					

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