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Improving students' learning through study tour

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Introduction

> *Teach me and I will forget; Show me and I may remember; involve me and I will understand. – Benjamin Franklin*

Evidences from teaching practice and research show that a student's attention starts to reduce after twenty to thirty minutes in a traditional lecture (Krakowka 2012, Bligh 1998). To provide effective learning environment, lectures can be combined with other teaching forms such as discussions, simulations, and fieldwork. Fieldtrip (or excursion, study tour) is considered an important way of encouraging deep learning, because students gain much out of seeing and experiencing things in person (Krakowka 2012).

In Urban Water Management course that I teach, study trip is one of the key components. However, much effort has been paid to practical things in earlier years' trips. I felt that it should be improved by more relating its contents to the lectures, and by promoting active learning and reflection during and after the trip. This was then chosen as the theme of the UP project. It is hoped that the project can provide evidence on what we can do for this and whether the improved study trips do contribute to the learning effect and the appreciation for the course. Experiences can be applied for study tours in other courses in the future.

The report first introduces the course used for this project and its study tours. Then related theories and actions done for improving the study tours are presented. Further on, the report presents the results of these actions,

by looking at the results of the pre- and post-trip questionnaires, the final course evaluation, the written exam, and by observation during the trips. The report finally analyzes and discusses the results.

The course and the study tour

The Urban Water Management course is within a two-years' master program 'Water and Environment' at the SDC (Sino-Danish Center for Education and Research) – a collaboration between University of China Academy of Science and the Danish Universities. It is taught in Beijing with both Chinese and Danish teachers and students. In 2015 the course runs for three weeks full-time. The 18 students come from various environmental disciplines during their bachelors. It aims at providing students sufficient knowledge on central issues relating to urban water systems and their challenges, so that they can apply their earlier knowledge to 'help the city to solve its water-related environmental problems'.

The course is based on lectures, in-class exercises, guest lecturers and study tours. Teaching is structured in two parts. The first part is mainly about knowledge building. The second part seeks to strengthen innovation skills with group assignment to provide an innovative solution with nature-based approach to an urban water challenge. Grading is based equally on a group assignment and a written exam. I am responsible for the study tours, a couple of lectures/in-class exercises, and course coordination. The overall course responsible and key lecturer, Professor Marina Bergen Jensen, supported with ideas and comments. The course had three study tours: two half-day's tours in Beijing right after morning lectures in the first part, and a two-days' trip to Tianjin Eco-city and TEDA in the start of the second part. Study trips are decided not to require written assignment, in order to balance the students' working load. Though attention has been put to all three study trips, the third study tour received more effort, because of its complexity and available time and resources. The objective of the study trip to Tianjin was to experience real eco-technology examples, with emphasis on water treatment and environmental technology. It is hoped that the students can link these examples with the taught theories and apply the theoretical knowledge for innovation.

Development of the course study tours for effective learning

Many scholars see the value of fieldtrips for learning because its role on consciousness-raising. Students are motivated to learn, since they receive challenges relating to them, and are urged to respond to those challenges (Freire 1970). They believe that education should 'involve the articulation of experience, critical thinking and reflection and action' (Jakubowski 2003). Others emphasize the role of fieldtrips for improving learning by doing. Referring to Kolb's theory that 'learning is the process whereby knowledge is created through the transformation of experience' (Kolb 1984). Krakowka (2012) saw the great potential of fieldtrips for the students to gain concrete experiences leading to the greatest degree of learning. He adapted Kolb's experiential learning cycle for fieldtrip and identified the main stages (Table 15.1). Wong & Wong (2009) conceptualized a three-

Table 15.1. Kolb's experiential learning cycle adapted for fieldtrips (Krakowka 2012)

Kolb's learning stages	Examples for fieldtrips
Active Experimentation PLAN	Looking at maps, researching the area of the fieldtrip, planning a route
Concrete Experience DO	The fieldtrip
Reflective Observation OBSERVE	Reflecting on the fieldtrip and what was discovered
Abstract Conceptualization THINK	Using what was experienced in a geographical framework Applying what was experienced to learned concepts

stages learning - research, experience, and capture - for how a fieldtrip can enhance student learning. 'Phase 1, the pre-trip phase, requires careful planning from the teacher and research by the students. During Phase 2, the on-trip phase, it is important for the teacher to take individual care of the students and for the students to keenly participate in all activities. Phase 3, the post-trip phase, requires the teacher to help students reflect on what they have learned from the class and from their experiences during the fieldtrip.' Mcloughlin (2004) then suggested some practical guide for developing a learning-effective fieldtrip (Table 15.2): These earlier theories and experiences are applied for the development of the study tours. Specific actions for the development of the study tours in Urban Water Management 2015 are presented in Table 315.3.

Table 15.2. Suggestions for developing a learning-effective fieldtrip (adapted from Mcloughlin (2004))

Teacher's action	The purpose
Plan interesting activities before, during, and after the trip	To encourage students to hypothesize, compare, analyze, synthesize, create, and reflect on their experience
Allow students' input into what trips they might like to take	Ownership increases engagement
Emphasize the trip's significance and learning objectives prior to the trip	To tie the trip to the curriculum
Incorporating student projects into a trip	To facilitate learning
Encourage verbal narratives about learned information, or sketches, photo essays, etc.	To intensify the meaning got from the trip experience
Discuss what they learned and discovered and share this with their peers	To make students to repackage and synthesize important content-related learning, reconstruct, reinforce, and to develop deeper understanding

Table 15.3. Actions for the development of the study tours in Urban Water Management 2015

Pre-trip phase
• The placements of the study trips within the course have been considered carefully to allow the students to relate the trip experience with what they have just learned, to reflect on it, and to apply their learning in the next step. For each study trip, a tour guide was developed with description of the detailed program, projects/places to visit, short introduction of the projects/places, maps/plans, and questions to find out and reflect upon during the trip. • For the tour to Tianjin, in order to give 'ownership' to the students, a pre-trip questionnaire was sent to students to collect input (Appendix I). • The tour programs were planned more carefully. The purpose of the study trip was communicated with the hosts. They were asked to provide basic materials before the trips and professional introduction during the trip. Tour guides were developed based on the basic materials. • In order to encourage the students to be more active in observation and discussion during the trip, a group of questions were assigned to each main site and included in the tour guides. The questions are combination of finding out concrete data or mechanism and questions for inviting reflection. • For the trip to Tianjin, a short pre-trip instruction was given to explain issues like logistic, safety, objectives, sites, questions. Besides, a summary of the students' input from the pre-trip questionnaire was presented. • It is repeatedly emphasized prior to the trip that the students are expected to collect ideas, materials and examples for their group assignment.
On-trip phase
• During the study tour, students are encouraged to ask questions and discuss with the local professionals. They are reminded to search answers to the assigned questions and note down/sketch the answers. Because most guides speak Chinese, Chinese students are invited to be interpreters. The students are encouraged to reflect on the experience on their way home.
Post-trip phase
• The first class after the study tour started with a one hour plenum session to summarize, reflect and discuss with the students on what have been seen during the study tour. Prior to this I summarize the key points and prepare the answers for the assigned questions. • After the written exam, a post-trip questionnaire was sent to the students to evaluate the study trip (see Appendix II).

The results

Pre-trip questionnaire results

Of the 18 students in class, 13 students have answered the pre-trip questionnaire. For how much they like study trips compared with other teaching forms, the average score is 4.7 out of 5. The reasons are: 'We can relate the excursion with the lecture if it is arranged soon after the lecture'. 'They broadened my horizon about urban water management and understanding on how they are carried out in the real world.' 'It is more fun than in-class teaching.' 'Through hearing and seeing, we are easier to find questions and then to get immediate reply from teachers or guiders.' For the future study

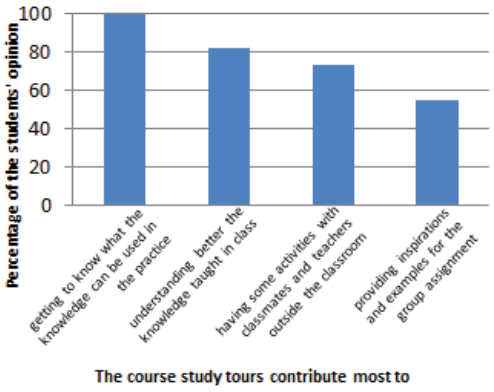

Fig. 15.1. Results to the question 'what learning aspects do the excursion contribute most'?

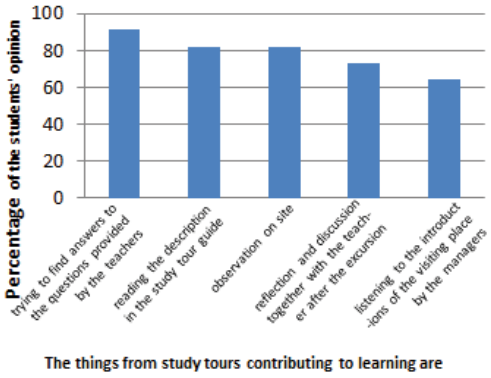

Fig. 15.2. Results to the question 'what you did for the excursion contributes to your learning'?

tours, the things they want to gain are, for example, 'an actual and visible example for the theoretical knowledge we learned in class', 'to see the actual use of what we have learned, to know whether it works well, to find out what can be improved to some extent', 'to learn how to get along with people and how to improve the innovation ability.' Especially for the trip to Tianjin, the students hoped to have more practical activities and challenges, e.g. exercises to facilitate understanding, 'to discuss some topics or assigned questions on the site', 'to know some background of the site and the purpose of the excursion', and to 'include a small discussion or summary about this excursion in the later lectures.'

Post-trip questionnaire

From all 18 students, 11 students answered the post-trip questionnaire.

For the questions on how much they like the study tours especially that to Tianjin and how much have the study trips helped on their learning process, both got an average score of 4.2 out of 5. There were mainly positive comments: For example, 'I really like the excursion. It is a good way to see how things are carried out in practice, and to give a better idea of the challenges behind'; 'It mostly fulfilled my expectation. It helped me to better understand knowledge learned in class and earned some personal idea. I thought why we built this eco-city there? Maybe we have better place to choose and how about the real benefit of the eco-city in the future'; 'The excursion had a lot to do with what we learned in class'; 'It was very interesting and very helpful. Because many managers gave us more details

about the eco-technology and it was also helpful for our group work'; 'It helped me very much on the understanding of how to do it in practice.' There are also less positive comments: For example, 'I have been to places like this before.' Figure 15.1 shows the results to the question 'what (learning aspects) does the excursion contribute most?' Figure 15.2 shows the results to the question 'what you did for the excursion contributes to your leaning?'

Other results referring to study tours

Students referred to the study tours, especially the tour to Tianjin in both the group assignment and written exam. This can be identified in four out of the six group assignments. For example, in a group assignment, the treated water is suggested to be used as water source of the landscape and water quality is suggested to be improved by a park with horizontal subsurface-flow and surface-flow constructed wetland. It is obviously inspired by the wetland park in Tianjin TEDA. In the writing exam, the last question asked students to reflect on the cons and pros of nature-based solution. A student reflected on the eco-city tour: 'Constructed wetland can improve the water quality and also become scenery for recreation. More eco-park or wetland park can improve the biodiversity too'; 'Some methods, like eco-city, really need high quality residents who possess a good environmental consciousness, which is a drawback.' The students also gave a good remark to the study tours in the final course evaluation. For the question 'please list the 1-2 best aspects of the course/what has been profitable', among the total nine comments seven emphasized that the study tours have been very good. For example 'Three excursions were very helpful for us to get practical ideas about what we learned'. It was also observed during the study trips that the students were eager to ask questions, both pre-assigned questions and questions from their spontaneous reflections. For example, in the seminar in the wetland park, one student asked about the water quality of the water in the lake and question whether it is harmful for the wildlife.

Discussion and conclusion

In the pre-trip questionnaire, the students' reflection on the effect of study trips echoes the earlier scholars' statements of the positive roles of field-trip, such as for conscious-raising and problem posting (Freire 1970), and

for improving learning by doing (Kolb 1984, Krakowka 2012). The students consciously appreciated that the study trips are well-related with the knowledge taught and they prefer active involvement than passive listening on site. This approved that my hypothesis for this project has been on the right direction to improve learning. The results of the post-trip questionnaire also show that the efforts of improving the study tour were rewarding. The students' referring to the study trips as an important factor for the course's success is an important evidence. Compared with the similar study tours last year when no special attention paid to improve the active learning of study tour and its link to the theoretical knowledge, the experiences from the study tours are better referred and reflected by the students in their assignments this year.

Whenever possible, the study tours, especially the tour to Tianjin, intentionally incorporated Krakowka's and Wong & Wong's theories and experiences into different stages of study tour. It is approved that a relevant and well-prepared study tour is very much preferred by the students, which experienced by the students has good effect on learning, for example supporting the deeper understanding of what taught in-class and motivated by the application of the theoretical knowledge in the real world. Some specific experiences can be drawn through the study tour development of this project:

- It is approved that the pre-assigned questions for each visit site are very effective for encouraging an active learning during the study tour. A carefully prepared tour guide including relevant introduction to the sites and a post-trip reflection/discussion session are also important for learning. Encouraging an active observation by e.g. relating the tour with the assignment and securing a good introduction by professionals are also helpful. The pre-trip introduction is also appreciated by students.
- The post-trip reflection session is good, but as a teacher guiding this session, the author felt that the students did not participate actively enough; therefore it needs to be improved. More instruments need to be introduced to promote their active reflection after the trip.
- It is good to emphasis the need for observation and collecting examples for group work.
- Only one student volunteered to be the interpreter during the tour. Maybe it is better to find more volunteers before the trip for interpretation, since this does promote the interpreter's active involvement and learning. Maybe a short session can be added prior to the trip for ex-

ploring the visit sites via internet. According to the learning circle, this is kind of experiment and will contribute to effective learning.
- The placement of the excursions is important. Excursion is best placed soon after the relevant theory taught.

Due to the time limit, only some basic measures for improving the active learning through study tours are applied, for example developing a question guide to each key site, inviting students' inputs prior to the trip and conducting a reflection session after the tour. Still these limited efforts have contributed to the learning effect of study tours and the apparition for the course. More measures inspired by other scholars' experiences are worth trying in the future and in other courses as well, for example setting off one hour in the class to ask students to explore the tour sites via internet, asking students to take some short reflection notes during and after the tour but before the reflection session, and relating study tours more to the assignments.

Reflection on the discussion with colleague

My colleague Peter Stubkjær Andersen read and commented on this report. He thinks that this is an interesting topic and generally well-written. He especially likes the application of Kolb's learning cycle to fieldtrips and finds it useful for him to arrange fieldtrips from this perspective. 'It will improve the learning outcome for sure'. He criticizes that I had much more actions on pre-trip phase than the latter two phases and suggests I expand focus to the other phases also. He also criticizes that the questionnaires had too few questions – 'Getting more information about students' impressions could be nice'. Finally he suggests that I could have incorporated the concept of institutionalization in the report, which is especially related to the post-trip stage – reflecting on the experience from the trip and put it to the broader learning context.

I think that Peter made some good comments and suggestions. It is true that more efforts should be done during and after the tour. The challenge during the tout is that time for each site is limited. The students are busy on listening, asking questions and making notes. There is often very little time left for making more interactive learning. This could be improved by reducing the sites to visit and really making important ones an effective learning process, by, for example, adding a discussion/reflection session

with groups already during the tour. Moreover, to apply institutionalization theory for improving the post-trip reflection stage may improve the results of the project. It has been my intention that I limited the questions in the questionnaire. I did not want the students to feel pressure by these two extra tasks in this short course with rather heavy working load. It has been a great learning process for me to intentionally make effort for improving student's learning. It is especially helpful to relate this practice with the earlier theories and practice. It has been a nice surprise that there have been others who had more experiences and made more thinking on the similar topic. As a teacher it has been encouraging and rewarding to experience that efforts for students do lead to harvest.

Acknowledgement

I pay my gratitude to my colleagues Peter Stubkjær Andersen and Marina Bergen Jensen for their comments on this report, and to Michael May for his comments during the project process.

A The questionnaire questions for improving learning through course excursion

Your name / E-mail: _____

- How much do you like course excursions in comparison with other forms of teaching, e.g. lecture, in-class exercise, group work etc.: Please give a 1-5 scale (1=do not like; 5=like very much), then explain shortly why you like or dislike?

- What do you want to gain through course excursions?

- What experience do you miss or dislike from earlier excursions in the program?

- Do you have other suggestions for the coming excursion?

B The questionnaire questions for evaluation on the excursions' learning effects

Your name / E-mail: _____

- How much have the course excursions, especially the last excursion, fulfilled your expectation? Please give a 1-5 scale (1=not at all; 5=fulfilled to a high degree), then explain shortly why you say so.

- How much have the course excursions helped on your learning process? Please give a 1-5 scale (1=not much help; 5=helped to a very high degree)

- What does the excursion contribute most? (You may choose one or more aspects. Please state the more important first.)
  A: Understanding better the knowledge taught in class;
  B: Getting to know what the knowledge can be used in the practice;
  C: Providing inspirations and examples for the group assignment;
  D: Having some activities with classmates and teachers outside the classroom.
  E: Other...
- What you did for the excursion contributes to your learning? (You may choose one or more. Please state the more important first.)
  A: Reading the description in the Study Tour Guide;
  B: Listening to the introductions of the visiting places by the managers;
  C: Observation on site;
  D: During the visit, trying to find answers to the questions provided by the teachers;
  E: Reflection and discussion together with the teachers after the excursion.
  F: Other...

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