

“Investing in a sustainable future”

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Abstract

In the innovative capstone course „*Investing in a Sustainable Future*” business, engineering and science students learn about the impact of environmental concerns on financial decision-making and the impact of financial concerns on environmental decision-making. In this class, cross-disciplinary teams of students from the United States and Germany learn and work together via IP-based videoconferencing technologies on rigorous, real-world projects that take into consideration both environmental protection and business practicality.

The student teams are asked to identify a real-world environmental problem faced by a business concern, and to develop an environmental-financial analysis supporting a preferred solution. Incorporating elements from traditional economics, ecological economics, industrial ecology and sustainable development, this course challenges students to think beyond conventional measures of business performance in developing innovative solutions to environmental problems. To the best of our knowledge, no other comparable course exists in the American or German university systems.

There are several innovative teaching elements implemented in the course:

- It uses experiential learning. Students work in teams to resolve real-world problems with environmental implications, e.g., redevelopment of a site, selecting a manufacturing technology, etc. At the end of the class, they communicate their findings in a formal presentation before an audience of business practitioners and professionals. Experiential learning is a proven pedagogy for teaching students not only to know, but to act.
- Cross-disciplinary teams are a powerful force for changing attitudes.
- The course’s structure stimulates and encourages discussion between students from very different cultural backgrounds. There are vast differences in the values, attitudes and norms US and German societies hold with respect to the environment.

1 Introduction

Investing in a Sustainable Future is a cross-disciplinary, cross-cultural and collaborative learning experience providing participants the opportunity to identify, evaluate and apply innovative business-based solutions to environmental problems. Upper-level students from the United States and Germany will learn about the many challenges associated with the transition to a sustainable society, and will work together in multidisciplinary teams to analyze real-world investment projects meeting rigorous standards for sustainability, strategic fit, financial performance, and business.

In the innovative capstone course *Investing in a Sustainable Future* business, engineering and science students learn about the impact of environmental concerns on financial decision-making and the impact of financial concerns on environmental decision-making. In this class, cross-disciplinary teams of students from the United States and Germany learn and work together via IP-based videoconferencing technologies on rigorous, real-world projects that take into consideration both environmental protection and business practicality.

The instructors of the course are Prof. Mark White, Associate Professor of Commerce at the University of Virginia's McIntire School of Commerce (UVA), and Prof. Dr. Edeltraud Guenther, Professor in Environmental Business Management at the Technical University of Dresden (TUD). The idea for such a project existed in our minds since several years. In 2004 we have gained the Procter & Gamble Foundation Award for Curriculum Development at regionally accredited U.S. colleges and universities. With this funding from the Procter and Gamble foundation we developed the course *Investing in a Sustainable Future* in detail. In designing this course we were heavily influenced by Dee Fink's (2003) *Creating Significant Learning Experiences*. This book advocates a student-centered form of education, which we find particularly compelling for the teaching of sustainability.

2 Target of the project and target group

Culture and currency of each nation influence domestic and international business and financial operations. Mostly lectures in universities are focussed on the currency issue, and less on differences in culture. Within the framework *Investing in a sustainable future* we want to increase students' awareness of cross-cultural differences as a prelude to understanding differences in international managerial and financial policies, because if graduates start working they work together with persons with different cultural backgrounds. (White and Whitener 1998)

Value creation is the objective of all business activity, be it for customers, employees, or investors. Maximization of shareholder wealth is the goal of all financial practice in the United States and in many other parts of the world as well. The ability to create and manage value depends upon one's capacity to identify and forecast future events, to evaluate the strategic and financial implications of particular alternatives, and to apply oneself to the implementation of a particular choice. This course concentrates upon the acquisition and development of these critical business skills while maintaining a vision of sustainability at its forefront.

This course is designed to be a “capstone” course for undergraduate students from many different disciplines. It is designed to provide students with the opportunity to integrate and apply knowledge acquired in other courses and work experiences towards the solution of an important real-world problem, i.e., the creation of shareholder value within the dynamic of growing resource demand and decreasing resource availability. Students’ grasp of concepts from ecology, economics, history, engineering, planning, psychology and management will be well exercised in developing the intuition and arguments necessary to achieve this result.

Environmental business professionals are often called upon to interpret various aspects of mankind’s impact on the natural environment as they might relate to a particular firm within a particular competitive framework. To this end, students will be expected to develop an understanding of the various global environmental and social trends affecting business organizations (e.g., global climate change, environmental legislation, changing consumer preferences) and to demonstrate this knowledge in classroom discussion. It is not enough to simply collect facts and figures and display them in pretty charts. Information is not an acceptable substitute for ideas and analysis.

Developing a strategy to create shareholder value is a significant responsibility, and all undergraduates will be asked to accomplish it while working with other members of the class. The experience of working together on a large, complex assignment offers every student the opportunity to develop job-related interpersonal skills in a controlled environment. The ability to coordinate the actions of others in isolating problems, researching alternatives, and suggesting solutions will be critical in delivering a high-caliber product on time.

The course emphasizes performance, not effort. It provides the students with the opportunity to measure herself/ himself against some of the best and brightest business students in the nation and to learn from them. Group management skills are critically important for the success in this course. Various writing assignments and the Sustainable Investment Project paper will highlight the written communication skills of participants and various oral presentations will showcase the students’ command of the spoken word and ability to respond to penetrating questions. The final presentation will be evaluated by outside judges from academia, industry and government.

3 Methodology und Didactics

In preparing for the course *Investing in a sustainable future*, we challenged ourselves to adopt Fink’s (2003) innovative course design method and teaching techniques encouraging students achieve significant learning experiences. According to Fink (2003) “Good courses are courses that...

1. Challenge students to SIGNIFICANT learning
2. Use ACTIVE FORMS OF LEARNING.
3. Have teachers who CARE ... about the subject, their students, and teaching and learning.
4. Have teachers who INTERACT WELL with students

5. Have a good system of FEEDBACK, ASSESSMENT and GRADING.”

The result of Edgar Dales' (????) research shows that the levels of effectiveness in learning are directly related to the participation of the student. The famous “Cone of Learning” presents the retention rates of students depending on different learning circumstances (see figure 1). The students bear in mind the transferred knowledge the more active and interactive the teaching and hence the learning. Today a normal study is composed of different lectures and literature study. But these kinds of teaching elements induce low retention rates. Sometimes students have to write a paper and have to do a presentation. Subsumed less active learning, less use of knowledge. Our designed class composes of many active elements. With Dee Fink's six different kinds of learning in mind we hope to increase the retention rates our students.

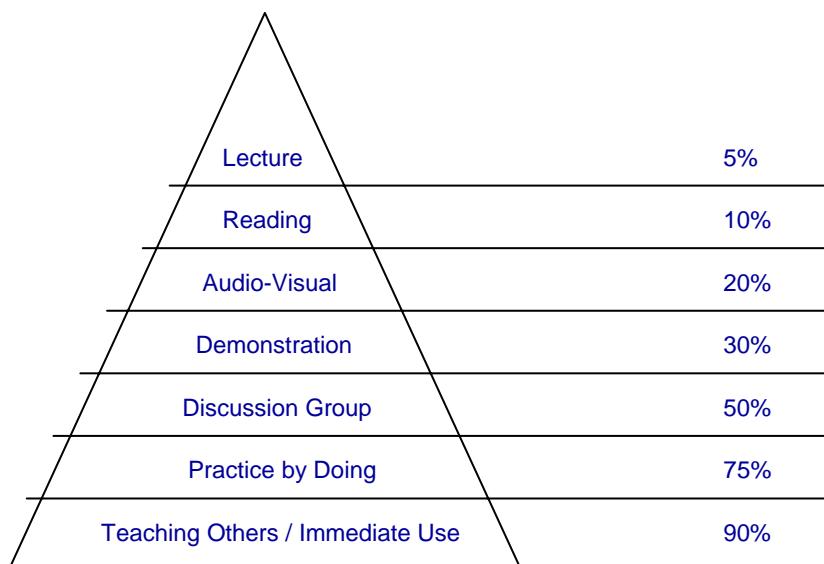


Figure 1: Cone of Learning (Dale o.J)

Dee Fink's six different kinds of Significant Learning, called as “Taxonomy of significant Learning” are *Human Dimension, Integration, Application, Foundational Knowledge, Learning How to Learn, Caring* and *Human Dimension*.

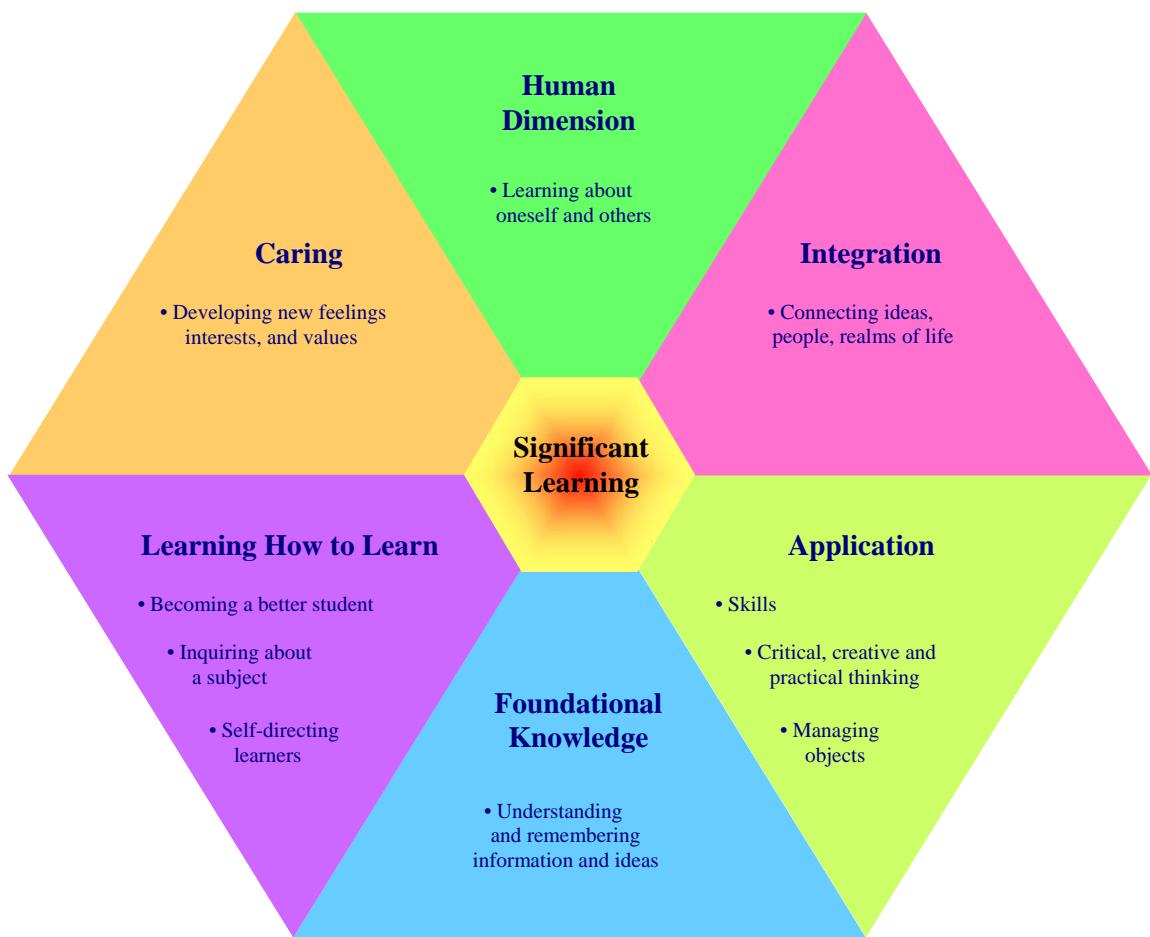


Figure 2: Interactive nature of significant learning (Fink 2003)

The element *Foundational Knowledge* describes the ability to understand and remember specific information and ideas, and also provides the basic understanding necessary for other kinds of learning.

The aspect *Application* aims to how to engage in some new kind of action and allows other kinds of learning to become useful.

The ability to see and understand the connections between different things is characterized by *Integration*. It gives students a new form of power – intellectual power.

Human Dimension means learning something important about oneself or others enables one to function and interact more effectively. It may provide a new understanding of oneself (self-image) or a new vision of what one would like to become (self-ideal).

Caring describes new feelings, interests or values that arise as a result of an experience. When students care about something, they gain the energy for learning more about it and making it a part of their lives.

The dimension *Learning how to learn* focus on becoming a self-directed learner. It enables students to continue learning in the future and to do so with greater effectiveness.

A critical element of Fink's taxonomy is that it is not hierarchical, but relational and interactive. Each kind of Learning dimension is interactive and can stimulate by every kind of learning dimension. The more kinds of learning goals a course includes, the greater the possibility of achieving significant learning outcomes. Consequently, we will be using a variety of media, games, simulations, role plays, videos, discussions, lecturettes, projects and exercises to elicit learning on many different levels. As this is the first time we will have used many of these techniques.

Students taking this course should hope to achieve:

- increased knowledge of course facts and concepts, e.g., the role of ecological capital, weak vs. strong sustainability constraints, applied cost-benefit analysis, decision-making under uncertainty, etc.,
- improved thinking, reasoning and problem-solving skills, especially with regard to the identification and framing of real-world problems and alternative solutions,
- greater appreciation for the contributions of others and enhanced ability to work in cross-functional, cross-cultural teams, and
- a sophisticated array of communication and presentation skills.

Our objectives are:

- to communicate structures for examining the challenges associated with achieving a sustainable society,
- to equip students with the necessary tools for making wise decisions, and
- to provide a forum for application and experimentation. The overall course structure – “Identify - Evaluate - Apply” – mimics these goals while providing a handy framework for future problem-solving.

4 The Course: Investing in an Sustainable Future

4.1 Implementing Learning activities

The aim to achieve a higher retention rates implements that we have to use different learning activities. Fink (2003) differentiates between three areas of active learning, which describes a holistic view of active learning – “Getting information & Ideas”, “Experiencing” and “Reflecting”. Therewith quality of student learning increase all three components should use in variety of ways. Therefore we try to realize every kind of active learning – every unit of the course shall contain parts of “Getting information & Ideas”, “Experiencing” as well as “Reflecting” (see Table 1).

	Getting Information & Ideas	Experiencing		Reflecting (on what one is learning and how one is learning)
		“Doing”	“Observing”	
Direct	* Primary data and sources	* Real doing (in authentic settings)	* Direct observation of phenomena	* Classroom discussion * Term papers * in depth reflective dialogue and writing on the learning process
Indirect, vicarious	* Secondary data and sources * Lectures * Textbooks	* Case studies * Simulations * Role-play	* Indirect observation, e. g. watching a movie	
Distance Learning (online course, interactive video, correspondence courses)	* Course Web site * Internet * Video lectures * Printed materials			

Table 1: The holistic view of active learning (following Fink 2003)

a) Getting information and ideas

“Getting information and ideas” belongs to the passive learning and is for a teacher the most common and also easiest component. But a student can receive information and ideas in different ways. Reading original sources and examining original data is a direct method. In our courses students have to examine original data, e.g. different statistical data about the development of energy prices or the gross domestic product about several years and in different countries. Our graduates have to read a lot of original sources, especially at the beginning of the course and at the start of a new topic. But original sources are more important than textbooks. Of course we use indirect form of “Getting information and ideas” like reading textbooks and secondary data. The third form of “Getting information and Ideas” is “Distance learning”, e.g. course web site, internet, video lectures and printed materials. This way of learning has increased in the last years very strong. On our course web site students can find a syllabus, which is very detailed – schedule, content of the course, grading, literature. The first paper, which students have to write, is about the syllabus. The advantage for us is to get suggestions for improvement of the syllabus. The internet is used for literature search, getting information about companies, e.g. what companies work sustainable, and also for the communication between the American and German students.

b) Experiencing

“Doing experiences” means that we show how to do, e.g. reading articles critically, writing essays about the subject. Additionally Fink (2003) differ between “Direct and Indirect Doing Experiences”. If a students doing something real in an authentic setting, so it is a “direct doing experiences”. We implement this kind of “Experiencing” in the way of presentation – our

students have to do a huge number of presentations, e.g. a short presentation of a book review and of course the presentation of the final project. Especially at the beginning of the course we record the students' presentation, therewith the students can watch his own presentation with regard to gesticulation, mimic, speed of speaking, volume – for the student it is a big learning process. The diversity of "indirect doing experiences" is very high – case studies, simulations and role-play. Case studies enable students practicing to solve problems and make decisions. The advantage for students is also that case studies involve no risks and no consequences in contrast to real situation. Over the time we collected and compiled various case studies. At the beginning of a course is played "Classroom Jeopardy" or we realize the Case Study "Life cycle costing: Dime and Nickel" (see table 2).

"Observing experiences" means that students can observe phenomena or they receive stories about the topic under study, e.g. movies like Al Gores's "An Inconvenient Truth" or "White Gold: True costs of cotton" ("Direct Observing Experiences"). An "Indirect Observing Experience" is the game "Ecobalance Jungle Safari". An observing Environmental certification is a growing industry and a method for differentiating products in hopes of achieving price premia and/or better credibility with customers. For this assignment students venture into the wild aisles of Wal-Mart, the Teeter, or any other grocery/discount store in search of ecolabels. If the product is cheap and/or students' can use it, they buy it and bring it to class. Otherwise, they can take a picture of the product with its ecolabel prominently displayed.

Topic	Exercise
Getting started	Classroom Jeopardy (http://www.classroomjeopardy.com)
State of the planet	Movie: White Gold: True costs of cotton (Environmental Justice Foundation (o.J.))
State of the planet	Sustainable UVA Calendar/ Sustainable TUD Calendar
Limited Resources	Ecological Footprint (http://www.myfootprint.org)
Limited Resources	Food for Thought (Population Connection 2004)
Life cycle cost	Case Study: Life cycle costing: Dime and Nickel (Guenther/ Kriegbaum 1997)
Externalities	Baregg Tunnel (Ullrich 2002)
Coase Theorem	Math tasks and paper planes (Hoyt/ Ryan/ Houston 1999)
Systems thinking	Dining hall waste management
Biomimicry	Souvenir analysis
Ecobalances	Ecobalance Jungle Safari

Table 2: Interactive exercises during our course

b) Reflecting

After students have got different information and ideas to the topics and had “doing” as well as “observing” experiences, they have to reflect it. There are different possibilities for reflecting the subject of the course – classroom discussions and term papers. Discussions take place nearly every week to the current topic. In the whole course will be several homework assignments due throughout the term. Some will be individual and some will require to work together in small groups.

At the beginning of the course we started with simple assignments e.g. “Sustainable UVA calendar” (USA) and “Sustainable TUD Calendar” (Germany).

“Sustainable UVA Calendar/ Sustainable TUD Calendar”

During the first lessons students read different literature and journals about sustainability. Furthermore we give students a questionnaire on topic sustainability – for further understanding. After those large information students are asked to create a poster for a “Sustainable UVA Calendar” respectively “Sustainable TUD Calendar”. Posters should inform members of the University community about these issues and ways in which they might change their own personal behaviours to live more lightly on the planet. We display the results on the classroom’s walls and ask participants to walk around and examine the posters, and to indicate their top three picks for inclusion in the hypothetical calendar using Post-It notes. After everyone had made their selections, we tally the votes and then have a discussion about why certain posters were selected and others weren’t. The exercise was a tremendous success – students were exposed to a marvellous number of sustainability-related topics, e.g. water use, soil erosion, income disparity, global warming, etc., in a relatively short time and were quite proud to explain their concerns and work to their peers. In our highly-competitive academic environment, the fact that the posters were of varying quality also proved beneficial in establishing high standards towards which the majority of students now strive.

In Germany the “Sustainable TUD Calendar” was given to the Minister of Environment Sigmar Gabriel, who was very astonished about the students’ ideas with respect to solutions of environmental problems and maybe it is an impulse for a common research project.

Sustainable Investment Project

The final assignment is the *Sustainable investment project*, which is the course’s capstone experience and offers the participants the opportunity to integrate, analyze and apply the concepts, frameworks and strategies developed throughout the semester. Working collaboratively in cross-disciplinary and cross-cultural teams, students should develop proposals to resolve real-world business and social problems in a manner consistent with the attainment of a sustainable future.

3-4 American students will be partnered with 2-3 students from Germany. Essentially, the American teams will propose the initial project – in consultation with the German teams, which should be implementable in both countries or another common location, if appropriate. Both groups will work on the project together, although the American Teams will of course have primary responsibility for achieving and producing the deliverables. Groups should work

together to realize their own meeting times. Small cameras allowing realtime videoconferencing over the Skype network will be provided for each group, if they wish. One condition is that each American-German-Team must provide their own laptop. The final presentation will be broadcast via videoconference, after which the German teams will pick up the ball and run with it during their Summer semester, adding more in-depth information specific to their particular flavour of the course.

The three key deliverables for this project are the preliminary report, an accompanying descriptive poster and the final report. The final written report should demonstrate the high level of professionalism appropriate to students' standing as University students in their final semester of school. We expect paper to be the best in terms of its content, analysis, and communicative skill. The *Sustainable Investment Project* should be an exposition and application of the concepts discussed in class, specifically, whether the project overcomes the sustainability, strategic, financial and practical hurdles.

To ensure that things are not put off until the last minute and also to provide opportunities for students to receive feedback before the final project is assembled and handed in, are there several milestones for the *Sustainable Investment Project*.

Following subjects were chosen by students in 2007 "Investing in Sustainability from Home", "Rethinking UVA Energy – Combined Heating & Power" respectively "Rethinking TUD Energy – Combined Heating & Power", "Green Dormitories", "The Homegrown Restaurant" and "Message in a Bottle (Glass Up-Cycling)".

4.2 Grading

Before starting the course a complete grading system should exist. During the development of grading system we follow three rules. First, a grading system should be manifold, so that different ways of learning have a chance. Second, the items of different scores should reflect the learning goals and learning activities. Third, the importance of every learning activity should be determined. (Fink 2003)

So we decided, that students' "Contribution to Classroom Learning" has the relative importance of 20%, the "Homework assignments" as well as the "Sustainable Investment Project" are weighted each by 40%. Furthermore we use for every assessment of students' performance detailed criteria like for the assessment of the "Contribution to Classroom learning" (Little 2006, Maznevski 1996) (See Table 3).

Score	Criteria
0	Absent
1	Present, not disruptive Tries to respond when called upon, but does not offer much Demonstrates very infrequent involvement in discussion
2	Demonstrates adequate preparation; knows basic case or reading facts, but does not show evidence of trying to interpret or analyze them Offers straightforward information (eg, directly from a case or reading) very infrequently (perhaps once a class) or without elaboration Does not offer to contribute to discussion, but contributes to a moderate degree when called upon Demonstrates sporadic involvement
3	Demonstrates good preparation; knows the case or reading facts well, and has thought through their implications Offers interpretations and analysis of case or reading material (more than just facts) to the class Contributes well to discussion in an outgoing way; responds to other students' positions, thinks through own position, questions others in a constructive way, offers and supports suggestions that may be counter to the majority opinion Demonstrates consistent ongoing involvement
4	Demonstrates excellent preparation; has analyzed case or reading exceptionally well, relating it to other materials (eg, other readings, cases, course material, discussions, experiences, etc) Offers analysis, synthesis and evaluation of case and reading material, ie, puts together pieces of the discussion and develops new approaches that take the class further Contributes in a very significant way to ongoing discussion: keeps analysis focused, responds very thoughtfully to other students' comments, contributes to the cooperative argument-building, suggests alternative ways of approaching material and helps the class analyze which approaches are appropriate, etc Demonstrates ongoing and very active involvement

Table 3: Grading Class Participation (Maznevski 1996)

4.3 Evaluation

At the end of the course we effect several evaluations. At first the students have to evaluate each other. We asked each student what kind of role they played in the group, who person workes effective, who was a team player and so. These evaluation sheets we evaluate and give the results to all students.

Furthermore we ask students for evaluate our course, so that we can improve the course next time. Students of the last course said that the biggest problem for the “cooperation project“ is the time shift between American and German within the summer / spring term structure. While American students start their spring term in March, their German counterparts might still write exams or already enjoy holidays at the same time. An adequate, satisfying solution could not be decided upon. Little worries exist over the time lag (hours). Following solution suggest our students.

The start of the course should be first or second week in summer term 2008, which begins with a „*Getting in touch*” – video conference where students but also coordinators get to know each other. This appointment should be also used to agree upon the overall objectives as well as all procedures surrounding the “cooperation project” and form the American-German teams for the two block seminars. Perhaps one week later every team member is obliged to have had contacts till that date and then the first block seminar can start. Topic is assigned by coordinators. After ten days should end the first block seminar. Results of the first block seminar have to be delivered in form of a document. A video conference should provide a stage for all teams to discuss (cultural) differences in perceptions and approaching the assigned topics. After few weeks should start the second block seminar – each American-German-team has to work one problem set together. It shall help to intensify the contact between all team members. After ten days the final report should finish. The course will finish by a video conference. All teams present the final results to all students of Prof. White and Prof. Guenther. It will offer the chance to show the outcomes to the wider audience of all students.

5 Summary

This course was developed with funding from the Procter and Gamble Foundation and is intended to be a model for cross-disciplinary, cross-cultural and collaborative learning of sustainability issues. While other universities also offer courses in sustainability, we believe the combination of an integrative and active learning pedagogy, coupled with a real-world sustainable investment project, will make this class a unique and particularly valuable experience as you ready yourselves to address the challenges of mitigating human's impact on the planet in the coming decades.

Students suggestions and comments for shaping and improving the course are particularly welcome as we move through this inaugural offering. As we gain experience with both the material and its delivery, we're looking to sharpen our approach to facilitate even deeper and more accessible learning outcomes.

Finally, there is no “answer book” for this class. The problems we face with regard to ensuring a sustainable future will not be solved by a single discipline, and it's quite clear that a multiplicity of both approaches and strategies will be required. The Sustainable investment project provides an excellent example of this. As students identify a particular challenge, propose a solution and evaluate that solution against sustainability, strategic, financial and practical hurdles. We are honored and humbled by the opportunity to work with students on problems of such planetary importance. Best wishes for a satisfying and successful course!

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Annex



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Syllabus for the „Cooperation project“ with the University of Virginia within the framework of lecture “Environmentally Oriented Information and Decision-Making Instruments” Summer term 2008

„Experience may be nothing of value. One can do things wrong as long as for 35 years.“

„Erfahrung heißt gar nichts. Man kann seine Sache auch 35 Jahre schlecht machen.“

Kurt Tucholsky, German writer (1890 – 1935)

General information

In the course of the lecture “Environmentally Oriented Information and Decision-Making Instruments“ [Ökologieorientierte Informations- und Entscheidungsinstrumente, IE] at TU Dresden in the summer term 2008, the so-called „cooperation project“ with the McIntire

School of Commerce, University of Virginia (UVA) and Prof. Mark White's lecture "Investing in a Sustainable Future" will take place. Participants are offered the opportunity to substitute 15 points from their obliged total number usually rewarded for homework. Prof. Dr. Edeltraud Guenther and Prof. Mark White have received high honors for this innovative teaching project. In 2004, they have gained the Procter+Gamble Foundation Award.

Time and place

There is neither a fixed place, nor time for meetings and working hours on the final report. Instead, it is rather expected that each team arranges all necessary tasks to eventually write a final report themselves. Nevertheless, some deadlines and scheduled meetings are due eg for initiating the first contact and establishing communication channels between UVA and TUD students. More details can be found within the subchapter *Agenda* in this syllabus.

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Main goals and expectations

By actively participating UVA and TUD students should be able to obtain specific knowledge and following skills:

- to integrate within an international team
- to organize these teams together with all team members autonomously that means:
 - to discuss the relevant targets and objectives for the assigned topic
 - to define a methodology for problem solution
 - to organize a suitable work split between all team members
 - to establish a well-working communication platform among all team members
- to be aware of the necessity to perform individually upon the divided tasks
- to participate in two short-term projects: one only among Germans, one in mixed teams with American and German students
- to write each time a final report eventually together fitting in each member's contribution

In the end, the results of each team are to be presented as a written final report and presentation. As such, all teams are asked to present their studies together during a video conference in front of all other students. A date for this conference is fixed.

The framework

First trial for such a “cooperation project” was realized in summer term 2007. Based upon this past experience of TUD students, occurring shortcomings and barriers for success were discussed, reconsidered, leading towards formulate possible solutions. The latter will follow as kind of guideline in this chapter category. The guideline shall help to guarantee a smooth team work among all participants – in Virginia, in Dresden and, foremost, between the two places. It shall therefore support the overall idea of the „cooperation project“. The latter is still under development and Spring 2008 will be its second offering. The cooperation between students is as well a dynamic process. That’s why a steady feedback between all students and coordinators involved is seen as essential for the success and value of the “cooperation project”. The next step is a short description of the past „cooperation project“ of summer 2007. Then, a list is presented containing requirements, but also advices for the upcoming new summer term 2008.

The original idea of the “cooperation project” in summer term 2007 was to establish a platform for a common, transatlantic course structure where mixed teams could work on certain problem sets regarding environmental and sustainable issues. Hence, it followed the outlined main goals and expectations. Teams formed by American as well as German students should have contained of up to six members in total. Still in the ongoing winter term 2006/07, but shortly after the final written exam of the course [Grundlagen der Umweltökonomie und Ökologieorientierte Unternehmensführung], a kick-off took place. An online video conference between Dresden and Virginia enabled all coordinating professors and, at that time, four German students to get a picture of what is meant by “cooperation project”. Within the next weeks altogether 8 German and 20 American students could be motivated to participate. All students were asked to prepare a portrait on a poster. Those portraits in a nutshell covering a “face wall” were thought of giving a first impression of and, of course, to all participants. However, students were assigned to each group by an easy logic: each team should consist of an equal number of German students.

The original idea of having true, transatlantic, and conjoint teams work on the final report did not work out in the end. Even though attempts were made to exchange first suggestions and discussion as kind of brain storming, it eventually failed. In fact, American and German students were then separately editing different problem sets of the chosen topic within the teams. April 27 UVA students presented their final results towards an audience of all TUD students during a video conference. The German team members were only serving an audience. After the presentation those German students were reassigned a related but extended topic. Till the end of the summer term 2007, they were working on their final reports. Finally, a presentation was arranged for the beginning of the winter term 2007/08. A list of advices and suggestions will follow to handle certain bothersome parameters.

The *biggest problem* for the “cooperation project” is the *time shift* between American and German within the summer / spring term structure. While American students start their spring term in March, their German counterparts might still write exams or already enjoy holidays at

the same time. An adequate, satisfying solution could not be decided upon. Little worries exist over the time lag (hours). A solution could be found for this issue.

At the beginning, a first contact should be arranged. The idea of a “face wall” of the past cooperation project 2007 even though a good brainchild was not conducted appropriately to form the groups. The pictures and texts of the American students were only shortly available and a selection of team members upon those portraits was not realized. An alternative suggestion is the „*Getting in touch*“ video conference in the Agenda.

From the very beginning, it shall be clearly outlined how many *credit points* can be achieved by attending the “cooperation project”. In summer term 2007, students could substitute for homework assignments as many as 15 credit points. However, 15 points were partly regarded as too little by German students considering the amount of work and efforts. The “cooperation project” is surely a unique opportunity for German as well as American students to extend their intercultural communication skills. But, it shall be stated that American German working groups need considerably more time and patience to coordinate and easily talk due to existing language barriers. A suggestion of the students: up to 30 points.

In order to motivate all team members, a *Certificate* for successful participating in the „cooperation project“ might be handed out after the final presentation. Such a document attracts and enjoys high popularity among many students. The certificate should accentuate the international character, each team’s research topic and the time frame. In summer term 2007 all students did get a nice one.

The finding and decision upon the *conceptual formulation* for each team could, on principle, be conducted in an open process by the participating students themselves. Previous experience suggests in contrary a more fixed and unambiguous nature. The research problem has to allow for separate editing by American and German students – if necessary. Therefore, the idea of block seminars was born. There will be two 10 days of working together on a specific topic assigned by the coordinators. The first block will be edited separately by American and German students. However, one German and one American team will form one international group. Each team within each group will, at first, work on one problem set among their teams themselves. Finally, the results will be presented to each team within a group. It is intended to see the differences between the cultures in terms of approaching a topic. The second task will then be done with the two teams mixed in one group.

Moreover, a *Schedule* is required that fixes the cooperation and communication between the UVA and TUD students. Deadlines are the main appointments thought of shaping the schedule. A draft for such a schedule follows at the end of this syllabus. Of importance is that appointments regarding meeting or kick-offs are binding for all participants – American and German.

All students should maintain *close communication via computer or phone*. Therefore, participants are expected to be curious about some kind of technics and web based means for communicating. Next to traditional standards like emails services alike blogs, wiki-Media, Skpye or a choice of messengers offer plenty of possibilities. More details can be found in the subchapter “Further comments on the framework”.

There might be peer reviews during the team work, but definitely at the end.

Nevertheless, some *problems persistently exist* that could not be solved in all participants' interest, so far. On the one hand, there is yet no common handling of *non-compliance*. On the other hand, the time shift for the American spring and the German summer term is regarded as the most disturbing. While German students are still busy exams or alternative plans eg internship, holidays and language courses. Therefore, the setting up of a first meeting seems to be most difficult. It will be a challenge for future „cooperation projects“. In the end, such a starting appointment might have a small time frame for its conduct – either one week before or one week thereafter the final exam of the lecture “Basics of Environmental Economics and Environmental Management”. Even though not every student will be pleased by this plan completely, it helps some. If the first meeting is known well-ahead, students can plan upon the so existing *Schedule*. A shift – of daytime or month's time – in favour of TUD students would eventually discriminate UVA students. A solution that pleases all participants is offered by the block seminars as explained above.

Further comments on the framework

The influence of distance and physical separation should not be underestimated. Without doubts, every seminar where group work is due creates pressure upon each participant. The challenge is of social integrity, communication communications. Everyone is a bit different but the team has to arrange its own research activities. Prof. Mark White said once about team work: Forming, Storming, Norming und Performing. In addition, some problems occur to cultural differences. Even though it is motivation and gives reason for joining the „cooperation project“, it has to be reflected that only high additional work ensures this.

Communication across borders and the Atlantic could be realized with the help of many different electronic platforms. The TU Dresden offers rooms equipped with video conference technics. It can be used for free after prior consultation with people responsible. For German students: Please, contact Frau Haupt or the AVMZ for more details. Additionally, there are a lot of tools in the internet. For example, a Media-Wiki or Google Docs platform could be set up. Both facilitate simultaneous work of different authors, a peer review or discussion, and allow ways to visualize transparently all changes and comments. As for the individual „real time contact“, a wide choice of known instruments is available such as *Skype*, *ICQ* or *MSN Messenger*. Beyond, there are constantly more and more such platforms. There is plenty of material for guidance. A leaflet for helping with possible software solutions might be provided.

There might be a possibility to promote an internet-based platform and the forming of a block seminar: the American German teams could work together on creating and publishing a scientific article for Wikipedia. However, this idea is still under process.

Draft for a schedule

Start: first or second week in summer term 2008

- „*Getting in touch*“ – video conference where students but also coordinators *get to know each other*. This appointment should be also used to agree upon the overall objectives as well all procedures surrounding the “cooperation project”. Forming the American German teams for the two block seminars.

1 week later

- Confirming *group initiative* – that means every team member is obliged to have had contacts till that date. *Start of the first block seminar*. Topic is assigned by coordinators.

10 days later

- *End of first block seminar*. Results have to be delivered in form of a document. A video conference should provide a stage for all teams to discuss (cultural) differences in perceptions and approaching the assigned topics.

X (to be specified individually) weeks later

- *Second block seminar starts* – each American German team has to work one problem set together. It shall help to intensify the contact between all team members.

10 days later

- *Hand over the final reports* – and present the acquired findings. The report shall be written in English and compiled in one study even though separate editing before might have been occurred.

X (to be specified individually) weeks later

- *Closing video conference* – all teams present the final results to all students of the two courses at the UVA (“Investing in a Sustainable Future”) and TUD (“Environmentally Oriented Information and Decision-Making Instruments”). It will offer the chance to show the outcomes to the wider audience of all students.

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