Interactive technology enhanced learning for social science students

Philipp Budka, Claudia Schallert, Elke Mader
Dean's Office Faculty of Social Sciences
University of Vienna
Vienna, Austria
philipp.budka@univie.ac.at

Abstract—**This paper introduces the case of an interactive technology enhanced learning model, its contexts and infrastructure at a public university in the Bologna era. From a socio-technological perspective, it takes a look at the conditions and challenges under which this flexible learning model for the social sciences has been developed. Furthermore, selected evaluation results, including experiences and expectations of social science students, are discussed. The paper concludes that it is possible, with the appropriate didactical model, to create and facilitate interactive student-centered learning situations, even in "mass lectures".**

interactive technologies, learning, social sciences, Austria

I. INTRODUCTION

Teaching and learning conditions have been becoming increasingly challenging in the last years at the Faculty of Social Sciences of the University of Vienna, Austria. This, on the one hand, is due to transnational policy guidelines in the course of the Bologna process, aiming to "harmonize" or standardize the European education landscape, and their national and local implementation. On the other hand, social sciences have to deal with increasing student numbers, high student-teacher ratio, and overcrowded class rooms resulting in decreasing interaction and communication between students and teachers [2].

In 2007, social science study programs at the University of Vienna implemented a joint introduction phase with a core curriculum aiming to provide first-year students with an overview about the interdisciplinary character of the social sciences as well as their disciplinary specifics [10]. This new study phase has been constantly supported through projects that contributed to the development of its infrastructure, its curriculum, its lectures, and its didactical models. For the creation of the learning models those projects have been utilizing digital media technologies to create interactive and flexible learning situations in a blended learning environment. Furthermore, the introduction phase is under permanent reconstruction due to modifications of the curricula and due to recent legal requirements for all introduction phases at Austrian universities.

In addition to these structural challenges, a dissonance between the design of the Bologna conform social science study programs and students' study practices can be identified.

For instance, more than half of the students are working part-time right at the beginning of their actual full-time studies. And between 40% and 50% of beginners enroll for at least a second study program, despite the fact that a single bachelor (BA) study program is already designed for a weekly 40-hour student workload. These are amongst the reasons that up to 40% of social science students drop out during the first year.

Under these conditions and challenges, how does a flexible, interactive technology enhanced learning model support students learning situation? And what are the experiences and expectations of social science students within these new learning environments?

II. SOCIAL SCIENCE STUDIES FOR BEGINNERS AT A PUBLIC UNIVERSITY IN AUSTRIA

At the University of Vienna's Faculty of Social Sciences, teachers and administration staff have to handle about 1.900 first-year students starting their BA studies in political science, social and cultural anthropology, and sociology each fall. With 17.600 students, the faculty is one of the largest at the University of Vienna, where 88.000 students have been enrolled in summer 2011, making it by far the largest university in Austria.

In Austria access to university education is basically without restrictions. Any person with a high school diploma or a similar qualification is allowed to study at public universities, which mainly depend on the Austrian Federal Ministry for Education, Arts and Culture, i.e. the Austrian state, for funding. There are virtually no student fees and only few study programs have yet implemented specific selection procedures. High and increasing student numbers and how to handle them are thus a hot topic in Austrian politics, media, and public.

In 2007, the study program directors of the Faculty of Social Sciences – journalism and communication science, political science, social and cultural anthropology, and sociology – decided, with the support of the University of Vienna Rector's Office, to develop a joint introduction phase with a common core curriculum for student beginners. Due to its particularly high student numbers and already implemented BA curriculum, the journalism and communication science study program developed its own introduction phase, but has been supporting the joint introduction phase by providing teachers for the interdisciplinary lectures.

The joint introductory phase for social sciences has been implemented within two projects that both contributed this way to the facilitation of the Bologna reform process at the University of Vienna's Faculty of Social Sciences [2]. This harmonization process at European scale meant for the Austrian higher education landscape, for example, the replacement of the *Magisterium* degree with two-stage bachelor's and master's degrees. It also implied a change to the European Credit Transfer System (ECTS) and hence the redesigning of courses by recalculating the student work load.

Students within the joint introduction phase have been provided, on the one hand, with an interdisciplinary overview about social sciences theories, methodologies and contemporary debates. By considering social science commonalities, students are also expected to learn about the disciplinary characteristics of the participating study programs and thus should be able to critically reflect on their choice of study. Furthermore, the introduction phase should also contribute to the first-year students' overall orientation at the university and their social integration into this new learning environment. All students enrolled in one of the social science BA study programs, except journalism and communication science, have to go through the same introductory phase that consists of interdisciplinary (colored) and disciplinary (white) lectures and proseminars (Fig. 1).

Joint social science introduction phase - 30 ECTS

LEC - Basics of Social Theory (5 ECTS)

LEC - Basics of Methodology (5 ECTS)

LEC - Disciplinary Introduction (6 ECTS)

LEC - Orientation (1 ECTS)

LEC - Contemporary Debates (5 ECTS)

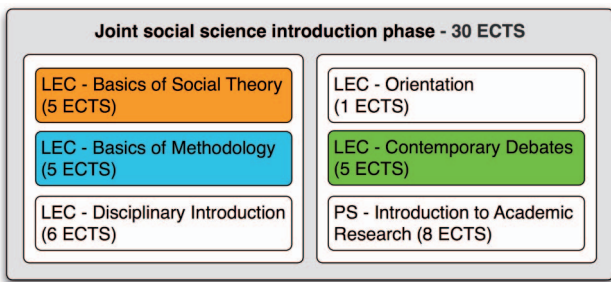PS - Introduction to Academic Research (8 ECTS)

Figure 1.   Courses in the joint introduction phase, winter semester 2010/2011 and summer semester 2011.

Until the summer semester 2011, the introduction phase had 30 ECTS. Students had to complete it within one semester, which is four months in Austria, to keep up with the schedule of the BA study program. As reporting numbers indicate, only about 10% of student beginners are actually able to accomplish that. The majority of students either drop out or they need more than one semester to get the required workload done.

Lectures in Austria – as opposed to seminars or proseminars – do not include continuous assessment of coursework, compulsory exercises, and mandatory attendance. Students are thus expected to study course material and prepare for exams by themselves, independently outside of the class room. For many students this means a radical change of learning patterns: from regular homework and compulsory attendance in school to self-managed, independent learning for university lectures.

Student attendance in lectures of the joint social science introduction phase varies over the semester. At the beginning and at the end of the semester, before the final exams, student numbers are usually higher than during the semester and can get as high as up to 500 students in the class room. Within such lectures it is obviously not easy to generate and implement interactive learning situations by a question and answer learning experience, for example.

So why are first-year students put into such courses? Why not offer smaller courses where teachers know students' names and interactively communicate with them on a regular basis? The answer is money, or better, the lack of money in publicly funded universities in general and for introduction phases in particular. Seminars, where students are coached and work in small groups, are much more expensive than large open lectures. Thus, at Austrian universities, particularly in the social sciences and the humanities, cost-intensive courses are primarily offered to advanced students who have a good chance to finish their studies. In Austria, publicly funded universities receive money from the state not for student beginners, but for graduates.

Considering these conditions, is it possible to create interactive learning situations for first-year students while preparing them for exams, for instance? And does the joint introduction phase enable student beginners to reflect on their individual choice of study?

III.   THE INTERACTIVE LECTURE MODEL AND ITS BLENDED LEARNING ENVIRONMENT

In order to support students' reflections and improve learning conditions in the social science joint introduction phase an interactive lecture model has been developed and implemented. This didactical model includes an interactive technology enhanced learning environment which itself consists of three basic elements: (1) the face-to-face lecture, (2) a content pool with hypermedia learning material, and (3) an online course facilitated through the learning management system (LMS) Moodle.

These three components enable and facilitate different modes of interaction among students, teachers and content [1, 8]. In this student-centered blended learning environment, students are able to interact with (1) each other face-to-face in the class room or online through the LMS, but also with (2) their teachers face-to-face and with (3) digital learning content online (Fig. 2).
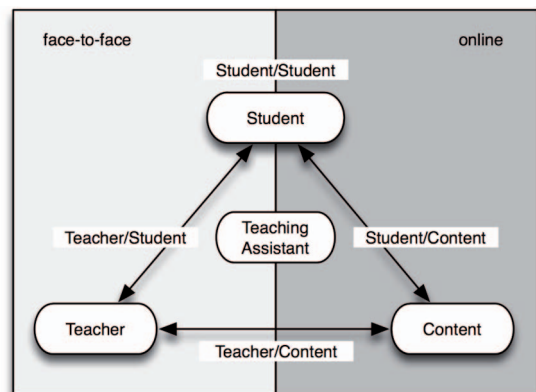

Figure 2.   Modes of interaction in a blended learning environment.

Due to the high student-teacher ratio, chances to actually interact and communicate with teachers in class are rather low. So a group of facilitators or moderators have been introduced to the learning model. Teaching assistants, who are advanced or graduate social science students working in interdisciplinary teams, which reflect the structure of the joint introduction phase, facilitate and guide all modes of interaction in order to support deep and meaningful learning. The support by teaching assistants is mainly accomplished online through exercises and assignments. Those are closely connected with the lectures of the introduction phase, their subject matter and in particular the final exam at the end of the semester.

Students, for example, learn about subject matter facts in class, reflect on that on their own or guided through online exercises, and discuss it with their peers or the teaching assistants online. Teaching assistants communicate the results of those discussions or questions of general interest back to the teacher, who then can choose to include explanations for those questions in the next lecture (Fig. 3). Since lecture attendance as well as online course work has to be optional at Austrian universities, the appropriation of this interactive learning model depends on students' learning practices, their prior knowledge, their individual learning styles, and their interest and motivation [2, 6]. In short, it is not possible to reach every student.
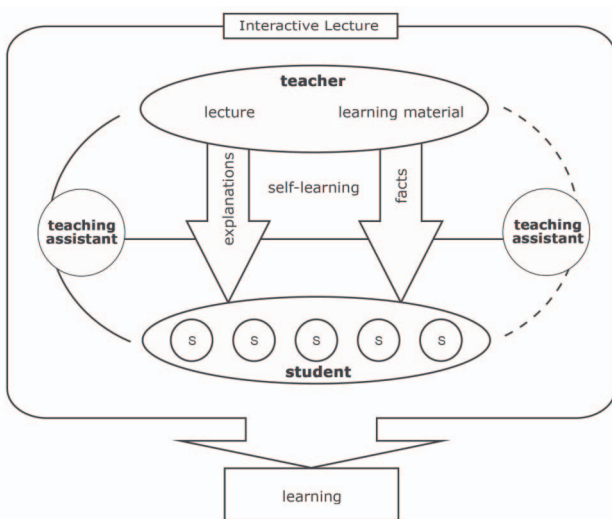

Figure 3.   The interactive lecture model.

Students, particularly in large classes and at the beginning of their studies, prefer interactive and flexible learning situations, where they have the opportunity to interact with teachers, tutors, assistants or other students [6]. Individual support, mentoring programs as well as bridging courses are therefore very much appreciated by students and teachers alike. Unfortunately, a publicly funded university with high student numbers, such as the University of Vienna, has in many cases not the financial means to afford all this. Nevertheless, it is possible with a flexible technology enhanced learning model to support an interactive student-centered learning situation. It is also possible to enable and support students to learn independently or in peer groups.

Since all online exercises and course work are optional and not mandatory as is attending the face-to-face lecture it is a huge challenge to motivate students to use the provided learning elements and tools. Supported by teaching assistants, students nevertheless choose, according to their very specific needs, from these offers to build up knowledge, learn continuously, and develop study skills and generic competencies [2, 7].

IV. Social science students' evaluation of the introduction phase

Several surveys have been conducted to learn about students' experiences and expectations. Over a period of three years student beginners were questioned in online surveys. Participation to those surveys was usually highest at the beginning of the semesters and when the project team could contact students via their personal e-mail addresses. In the following we are going to discuss selected results of the latest survey that was conducted in spring 2011 after the winter semester 2010/2011 (n=320).

A. *"The problem was that I had completely wrong assumptions about the study program." (first-year student)*

Social science students can be considered a distinct group within the Austrian student population. For example, with an average of 23 years of age the predominantly female first-year social science student at the University of Vienna is almost three years older than the average student beginner at Austrian universities [12]. And the main motivation for student beginners to study one of the social sciences is not to get a well-paid job, but simply interest, particularly in social phenomena. The following interpretations and discussions are either based on rating items using a 5-point Likert scale, 1 being "does apply", 5 being "does not apply", or percentage of "n".

Asked about their achievements in the first semester and what is generally important to them in their social science studies, survey respondents state that a positive graduation is of greatest importance to them (1.4). They also find their personal learning progress quite good (2.3) and that they are capable of fulfilling study assignments (2.0). In addition, students are mainly convinced that the phase has contributed to their intellectual development (1.9). One of every study program's objectives, intellectual development and increase of knowledge, could therefore be achieved in the joint introduction phase.

Students' evaluation of their social integration and communication at the university and in the social science introduction phase is not that positive. For instance, they experience only an average level of cooperation at the university (2.4), they don't make a lot of new friends (2.4), and they don't exchange much information about subject relevant and organizational issues with other students (2.5). Deficits can clearly be identified in the students' integration into everyday academic life at the university. While studying, their studies as well as the university as work place are not in the center of their lives (2.6). They experience problems to find and to get hold of contact persons (2.8). They don't feel to be supervised

well enough (3.1) and they feel to be left alone most of the time (3.3). It is in particular the contact with teachers that is missing. Since students have no chance to talk with teachers about subject matters, this item was rated lowest in the whole survey (4.1).

A peer mentoring program, which was tested for the first time in fall 2010, should support student's social integration in the university as new learning environment and the orientation in the introduction phase. In this optional program, experienced BA students of the social sciences support first-year students by sharing their experience and knowledge in small groups and informal settings. Those student mentors are trained by instructors in special courses to develop mentoring and supporting skills, such as group communication and learning to learn.

Because of the still prevailing lack of integration at the university, it is no surprise that students also responded negatively on a next set of items. Students experience no real connection to the university (2.9), reading scientific literature isn't a joyful activity (2.7), and they don't feel that they are already thinking like social scientists (3.1). In considering that one of the main objectives of every study introduction phase is to get to know epistemological basics and to learn specific scientific ways of thinking, than there is still much work to do.

B. "I think the (teaching assistant) support is really great and it's an excellent preparation for the final exam." (first-year student)

In this section we briefly discuss selected aspects of students' usage and evaluation of courses and support activities in the joint introduction phase. Students assessing the single courses of the joint, interdisciplinary introduction phase find, not surprisingly, that the disciplinary introduction lecture has the highest capability of promoting students' interest in their (disciplinary) studies (1.7). Interestingly, this pattern does not apply to the disciplinary proseminar (2.5), where students mainly learn about basic social science research practices. So it seems that it is in particular the subject matter content which is able to generate interest for the specific study program.

The supporting measures and activities in the introduction phase are primarily designed to handle the current study situation at the Faculty of Social Sciences and are all optional. No one is required to engage in any of those activities.

Time and spatial flexibility is made possible through blended and interactive learning models and environments. The interactive lecture model and the blended learning environment support self-learning as well as guided learning with the help of teaching assistants, for instance. Almost half of the survey participants state that they made use of the supporting activities, e.g. online exercises, assignments, and discussion, offered by the teaching assistants (47%).

The teaching assistant support worked particularly well in preparing students for the final examination and the essay, which was the assignment in the lecture "contemporary debates" (1.7). On the other hand, students rate the teaching assistant support for the development of an understanding for the commonalities and differences of the social science disciplines, which participate to the joint introduction phase, as least helpful (2.6). Since the joint introduction phase is changing rapidly and regularly, it remains critical that all involved teachers, teaching assistants, tutors as well as student mentors, emphasize those aspects of commonality and difference.

V. CONCLUSION

As the case of the social science joint introduction phase at the University of Vienna demonstrates, it is possible to create and facilitate interactive and flexible learning situations, even under challenging conditions in "mass lectures" at public universities. What is necessary is an appropriate didactical model, which fits the specific needs of the student population, and the utilization of digital technologies that allow for online communication and collaboration. It remains of course, also in this working blended learning model, plenty of room for improvement, e.g. in terms of integration and cooperation.

Literature [4, 5] as well as our experience in the last four years of development [2, 11] clearly indicate that a successful learning model has to have a strong and coherent integration of all of its elements, may they be online or face-to-face. To create such an integrated learning experience for students, teachers have to actively and systematically relate the face-to-face context to the online context and vice versa. Fragmentations in learning are thus avoided and interactive inquiry-like learning situations can be established. New interactive and digital technologies, such as social web and mobile applications, are able to facilitate not only more interaction but also more collaboration for students, also in mass lectures [3].

Social science students differ in some respect from other student populations, they are mainly female, employed, and they study primarily because of reasons of interest. But there is also student behavior that they have in common with many other students of the Bologna era, at least in the German speaking countries. Within new BA study programs, students feel that they are spending more time for their studies than they actually do [9]. Student beginners spend thus not nearly enough time for their studies as they should be spending according to the curriculum. A stronger module-like and blocked structure of the curriculum could tackle this problem, but again this probably would mean to invest more money by universities and the state.

For the winter semester 2011, the joint introduction phase again has to be changed, this time according to new legal guidelines. The introduction phase is shortened to half a semester and students are now required to successfully finish it before they can finish any other courses. This probably will put more pressure on the first-year students, making the introduction phase more competitive and challenging for all participating actors. All supporting activities have to be adapted to these new challenges, ideally without losing already working models and environments.

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