

Lecturers' attitudes on electronically supported pre-lecturing material for intensive programs: A case study

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Abstract: In 2006 and 2008, two large trans-national residential summer schools on conservation science were organized as intensive programs. Learners were not only second/third cycle students in both exact sciences and humanities, but further practicing restorers; consequently their educational background, and even their way of approaching scientific problems, were very diversified, and evaluation of the feedback brought about an urgent need for leveling knowledge and skills. The 3rd summer school, scheduled for July 2009, is addressing the issue by offering self-paced preparatory material authored by the lecturers, and obeying patterns that satisfy the specific needs of both an e-learning environment and a homogenization procedure. Before being offered to the attendees, the pre-lecturing material underwent an interim evaluation concerning its conformity to the Bologna process concepts, as well as to generally accepted methodologies for electronically supported distance learning. Furthermore, teachers were asked on their attitudes towards the proposed scheme. Evaluation of the answers permits drawing conclusions on how far lecturers are capable of and/or willing to accept the abovementioned course structure, in order to fit with a framework designed according to the student-centred Bologna approach, and the fundamental e-learning practices.

Key words: summer school; interdisciplinarity; preparatory material; e-learning; course development

1. Introduction

Since 1999 European universities have been going through the so-called Bologna process, in which forty states are now involved. The goal is setting up an open European higher education area by 2010. This in turn involves transparent and compatible degree structures, which are organized in three cycles. The qualifications framework for the Bologna higher education area has three elements, namely the three cycles: ranges of European Credit Transfer and Accumulation System Credits for the first two cycles; and the Dublin Generic Descriptors for another, drafted by the Joint Quality Initiative.

The Bologna process, the European response to the educational problems of our era, aims at an area, in which students can choose from a wide and transparent trans-national range of courses and benefit from smooth recognition procedures.

The goals of the Bologna process presuppose rethinking the traditional syllabus contents and make them more learner-oriented. The teaching mission of higher education institutions thus designed and the subsequent necessity for ongoing curricular reform, are resulting in an approach including clearly outlined learning outcomes.

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Student-centred education requires empowering individual learners by creating new approaches to teaching and learning, as well as effective support and guidance structures.

A parameter of outmost significance in realizing this target is the European Credit Transfer and Accumulation System, a student-centred system based on the workload required to achieve the objectives of a program—specified in terms of the learning outcomes and competences to be acquired. Student workload consists of the time required to complete all planned learning activities, such as attending lectures, seminars, independent and private study, preparation of projects and examinations. The grading scale ranks learners on a statistical basis.

In this frame, learning outcomes are dealing with subject knowledge, as well as abilities and skills. The latter are covering the demands set for each discipline by generic and specialized descriptors, and may be divided into three broad categories: discipline-related cognitive abilities and skills; discipline-related practical skills, if applicable; and generic skills. It is obvious that the greatest challenge is concerning subjects at the border of two or more traditional disciplines, for example, conservation science.

In the years 2006 and 2008, two residential summer schools on conservation science were successfully organized by the Working Group on Chemistry and Cultural Heritage, European Chemistry Thematic Network. They brought together approximately ninety students and fifty-five lecturers from thirty-one European and non-European countries. Highly pronounced interdisciplinarity is a core feature in conservation science studies, it even constitutes a main characteristic of this applied scientific subject. Humanities and archaeology; chemistry, physics and biology; geology and survey engineering; statistics and documentation; conservation and restoration—are fundamental topics, closely interconnected by the main goal of safeguarding the cultural legacy of the past, but difficult to cover in one institution. In this frame, short-term education and training courses, employing a transnational lecturing team guaranteeing expertise and diversity of viewpoints, are indeed the preferred means for acquainting students with applications of physicochemical/material sciences in the field of cultural heritage preservation, given that every contemporary university is offering the basic theoretical and practical knowledge, as well as the preliminary competences and skills indispensable for the subject (Skates, 2003).

Focused on the physicochemical aspects of cultural heritage preservation, having a strong practical character, the two schools aimed at: (1) giving attendees a solid knowledge on the ways natural/material sciences are applied in the safeguarding and authentication of tangible works of art; (2) acquainting them with state-of-the-art instrumental techniques; (3) offering a sound expertise in modern education tools; and (4) providing networking opportunities. The multinational team of experts from Erasmus and Tempus countries delivered theoretical lessons, problem-solving classes, and hands-on lectures on important aspects of conservation science, covering both information reviewing and notable case studies. The lectures were transmitted via video conferencing, thus further academics joined in various teaching activities from their home institutions. Moreover, young scientists were given the opportunity to present their researches results to the audience. Practical courses, actively involving all students divided into small groups, included state-of-the-art spectroscopic and chromatographic techniques as applied in cultural heritage diagnosis and preservation.

Taken into account that courses were held in English, students had the opportunity to attend regularly an English terminology and language course for conservation scientists, specially developed in the frame of the lifelong learning program/Erasmus/virtual campus project titled: systematization, valorization and dissemination of e-learning courses in conservation science; as well as to practice on the English version of online question sets dealing with chemical knowledge connected to conservation science.

2. Methodology

Learners were not only second/third cycle students in both exact sciences and humanities, but further practicing restorers. Consequently their educational background, and even their way of approaching scientific problems, were very diversified. Indeed, although attendees have a priori the indispensable basic scientific knowledge, there are considerable variations in the depth of their analytical/instrumental skills, theoretical understanding of physicochemical procedures, and acquaintance with humanistic issues. By offering all types of students a way to proceed to a wide-ranging combination of modules, and thus enabling them to expand their knowledge into fields and disciplines beyond a particular department's boundaries, the course proves deeply inter- and multi-disciplinary, and is greatly supporting homogenization.

Furthermore, the educational qualifications of teachers, as well as the learning outcomes expected and the pedagogical approaches used, are far from harmonious. Indeed, teaching staff is selected not solely among specialized chemists or physicists, but further amid restorers, archaeologists, biologists or engineers. Hence, both different educational experiences and distinct pedagogical concepts are first main characteristics of the summer school. In most group-based courses, trainers are attempting to present information to the typical or average learners. More competent attendees may become bored or frustrated, while less capable would feel lost or overwhelmed. On the contrary, a self-paced approach allows learners to take crucial decisions on the appropriation of knowledge and skills, by deciding on when, where, what and how fast.

A reasonable solution for structuring high-quality new courses, without increasing human and financial resources, is the incorporation of e-learning, so as to achieve teaching and learning based on phases of self-explanatory self-study that do not require further human assistance; as well as for extending enrollment possibilities and capacity.

Really effective learning cannot be accomplished by simply following lectures as part of a real or virtual audience. Indeed, background knowledge and understanding must not only be present, but furthermore stored in such a way that it is easily accessible and correctly understood. These principles lie behind the idea of prelecturing.

Evaluation of the feedback on the issue brought about a two-fold demand, formulated by the teaching staff as an urgent need of creating classes with leveled basic knowledge and skills, and by attendees as a request for preparatory study opportunities (Kozaris & Varella, 2008). Addressing the problem would fulfill the fundamental prerequisite for active participation; thus permit the 3rd summer school, scheduled for July 2009 as a lifelong learning program/Erasmus/intensive program, to perform on more solid bases.

The 3rd summer school is addressing at a European-wide degree for the possibilities of promoting state-of-the-art scientific education and training on material cultural heritage preservation, making large use of ICT infrastructures, as well as of modern digitalized educational procedures (Pitrik & Holzinger, 2003).

The pronounced preference of students at all levels for synchronous instruction and frontal contact, both with the instructor and other attendees, resulted in an increased use of blended learning. The term refers to the use of distance learning along with traditional face-to-face instruction in different forms or combinations to facilitate the educational processes (Duhaney, 2004). Studies in management education, for example, have suggested that web based distance learning is valuable but insufficient for teaching complex analytical, conceptual and interpersonal skills. The reasons presented include lack of communication richness, reluctance of some on-line students to interact with others, and the opportunity given to individuals with busy work schedules to delay, fail to complete,

or poorly perform learning activities (Bigelow, 1999; Salmon, 2000).

Taken into account that a blended learning approach is substantially supporting the integration of declarative and procedural knowledge (Kupetz & Ziegenmeyer, 2005), the educational framework is obeying the logic of a hybrid environment designed on the basis of a three-fold pattern—before, during and after each course unit or module. In the first phase, students are prepared for the lecture by having available all didactic material needed.

During the frontal hours, they are either physically present in the class, or approached by webcasting/archiving technologies; and afterwards they can benefit from study material, self-assessment opportunities and a meeting point with the instructor. Thus, the 3rd summer school is supported by a videoconferencing system allowing enrolled students to follow evaluated preliminary e-courses or equipment demonstrations, and take part in preparatory open discussions. Specialized tests are serving self-evaluation of candidates, and are assisting appropriation of knowledge and abilities offered. ICT is a substantial parameter in: (1) implementing the summer school in the desired quality of educational material and student preparation; (2) assuring an interactive follow up; (3) bearing both an open line for queries and well-organized relevant didactic material; and (4) guaranteeing long-term low-cost sustainability by means of an extensive database on the topic.

The preparatory educational initiative is founded on self-paced learning using the concept of pre-lecturing material (Sirhan, et al., 1999) in an electronic environment (Avril, 2007). Major benefits of this approach are easy access and continuous support of active learning. The material in question was authored by the lecturers of the 3rd summer school, obeying patterns that satisfy the specific needs of both an e-learning environment and a homogenization procedure. Main criteria for judging it has been keeping in accordance with the overall approach of the Bologna process concepts, as well as with the generally accepted methodologies for electronically supported distance learning (Mary, et al., 2006).

In the frame of the Bologna student-centred approach, care is taken to give students a clear concept of the learning outcomes, that is the knowledge and abilities they will acquire by following the course. In addition, their participation is promoted by offering keys to further study both in form of relevant scientific information, and as easily available appropriate references.

Thus, a presentation in Power Point or similar formats includes the following introductory items: (1) course category, course unit, and course unit contents; (2) further learning outcomes; (3) additional material, literary sources and bibliographical references; and (4) finally a number of self-assessment questions permitting a deeper understanding of the issue. Similarly, all specially recorded videos are accompanied by learning outcomes, additional material, and self-evaluation questions.

Education based on learning outcomes is largely adopted within the Bologna process as an approach of high relevance in the labour market, since factual qualifications are thus fully elucidated, while additionally non-formal educational experiences are also taken into account. Learning outcomes may be defined as statements on what a learner is expected to know, understand and/or be able to demonstrate after completion of a process of learning (Adam, 2006). This obviously student-centred notion is particularly important in preparatory courses, as it forms the final criterion for structuring clearly defined expectations from a given unit.

The concept of additional material, both in form of further information on specific items, and as selected easy-to-reach references, is completed by a detailed self-assessment test, permitting individual judgment on the coverage of learning outcomes.

Before offered to the attendees, the pre-lecturing material underwent an interim evaluation concerning its conformity to the abovementioned axes. At a second phase, lecturers were asked on difficulties during

reorganization of existing lecturing material according to the relevant guidelines, in what concerns introduction of learning outcomes and supporting data; on the necessity of possible external assistance for addressing the required electronic format; and finally on how far they considered the pattern imposed meaningful or even unavoidable, that is on their general attitudes towards the proposed course development scheme. Taken into account that teachers were resident in seventeen Erasmus and Tempus countries at the time of the survey, questionnaires were the sole appropriate form for proceeding.

3. Results and discussion

Although the guidelines were timely disseminated to the forty-nine prospective lecturers, conformity of the initially provided material to these fundamental pre requisites brought about the following results: 67% of the teaching staff included learning outcomes in their presentation, 34% compiled additional material, 82% offered bibliographical references, and 29% created self-assessment questions.

The figures are closely interconnected to those addressing a possible restructuring of the existing lecturing material. Answers to the question on authoring learning outcomes reaffirmed the lack of relevant experience (Kennedy, et al., 2006), since 52% considered the task very difficult, 26% difficult, 18% neutral, and just 4% easy, when using the five-point Likert scale. Although the notion of learning outcomes has reached a high-ranking status constantly sustained by the ubiquitous number of relevant references in conferences, official documents and communiqués, there is still a rather poor level of understanding associated with them, and their practical implementation across Europe is relatively rare. Detailed experience of learning outcomes is in fact limited to just a few countries at both the institutional and national levels. This gap presents a significant challenge to the Bologna process, and even calls into doubt the full realization of the European Higher Education Area by 2010. Thus, the need for their better understanding is turning to an urgent priority. Compiling additional information was judged as very difficult by only 2%, difficult by 8%, neutral by 18%, easy by 24%, and very easy by 48%, while pertinent data for offering references were on the same positive line—6% difficult, 14% neutral, 16% easy, 64% very easy. Creating self-assessment questions was regarded as very difficult by 10%, difficult by 24%, neutral by 32%, easy by 20%, and very easy by 14%. At the same time, no noteworthy lack of training in electronic technology was observed, since 86% smoothly prepared the presentation.

A significant parameter in successfully leveling knowledge and skills of all attendees in the interdisciplinary Summer School is the way that lecturers understand the learning and teaching process, that is their level of acquaintance with student-centred practices, as established within the Bologna process. In order to proceed to assessable results for the latter query, attitudes were categorized according to a phenomenographic perspective investigating the teachers' approach to teaching, i.e., their concepts of teaching and learning (Prosser, et al., 1994).

The pre-lecturing material is designed in the frame of a leveling initiative; consequently it is chiefly focused on transmitting knowledge, and practically all lecturers (96%) agreed that this objective is satisfactorily achieved once the proposed structuring axes are followed. The situation is clearly different when considering how far the material is assisting attendees in developing concepts. Having students with either scientific and technical or humanistic background, this parameter is on the whole judged as important; nonetheless, it is largely agreed (82%) that learners are rarely acquiring concepts during this preparatory phase.

Thus, the approach to teaching is generally focused on transmission of knowledge. Moreover, while setting up material for asynchronous, e-learning did not generate any problems to the teaching staff, a certain lack of

training in course development within the designed framework is obvious from the abovementioned results. Both authoring learning outcomes and creating self-assessment questions referring to them are crucial constituents of the Bologna methodology, and it appears that they should be further practiced by lecturers.

4. Conclusion

The case study is evaluating lecturers' attitudes on electronically supported pre-lecturing material from a double point of view, that is conformity to the Bologna process concepts, and compliance to generally accepted methodologies for e-learning. Concerning the first issue, the results evidenced that there is still a lack of experience on what learning outcomes exactly are, and on the way they should be structured, in order to form a significant assistance in designing the student's profile on knowledge and skills. Thus, it should be concluded that there is still a need for their better understanding. As to the attitude towards electronically supported teaching, European lecturers appeared well acquainted to the use of multimedia and information technologies in general as an educational tool.

A conclusion of didactic significance is that in this case of an interface subject addressed to students of various backgrounds, the pre-lecturing material is mainly yielding transmission of knowledge and not of concepts. The fact should be valid in all disciplines at the boundary of science and humanities.

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(Edited by Lily and Nicole)