

INNOVACIONES DIDÁCTICAS

RESEARCH-BASED DECISION MAKING: A COMPARISON OF FINAL RESULTS OF HISTORY TEACHING IN TWO PREDEFINED GROUPS OF TRAINEE TEACHERS

Estudio comparativo de resultados de enseñanza-aprendizaje de la Historia entre dos muestras predefinidas de alumnado para la toma de decisiones

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Abstract. This article stems from a research project conducted into possible factors involved in classroom learning. The project is based on a comparison of the academic performance of two groups within the subject of history teaching which, despite their morphological similarity, achieved different results. Analysis was carried out by comprehensively monitoring the individual activities of each student using the Moodle platform at the University of Barcelona. The project analyzed university entrance exams, academic performance in previous courses, academic backgrounds and other minor factors. The research concluded that none of these factors was decisive, meaning that other seemingly less important factors — such as the emergence of leadership in the class and the management thereof during the academic year — must be studied in depth in order to illuminate the issue.

Keywords: comparative assessment, social sciences, teaching history, university education, leadership.

Resumen. El artículo es el resultado de una investigación sobre los posibles factores que intervienen en un proceso de aprendizaje en un aula. La investigación parte de la comparación de los rendimientos académicos en una materia de enseñanza-aprendizaje de la historia de dos grupos morfológicamente similares pero con resultados distintos. El análisis se basa en el registro minucioso de las actividades individuales mediante la aplicación de la plataforma Moodle de la Universidad de Barcelona.

Los factores que se analizan son los referentes a: sistemas de acceso a la universidad, rendimiento académico obtenido en cursos anteriores, estudios de procedencia y otros factores menores. La investigación llega a la conclusión de que ninguno de estos factores fue determinante y que es necesario investigar en profundidad factores aparentemente menos importantes como la aparición de liderazgos en el grupo y la gestión de los mismos a lo largo del periodo académico.

Palabras clave: evaluación comparativa, ciencias sociales, didáctica de la historia, educación universitaria, liderazgo.

INTRODUCTION

On September 20, 2011, two courses on the Teaching of History began. The classes were virtually identical, and were both part of the Teacher Training program at the University of Barcelona's Faculty of Teacher Training.⁴ The courses were taught by the authors of this article, both of whom are professors in the aforementioned department. The first group, which we shall call Group A, comprised 54 individuals, including the two professors and two individuals listed in the Moodle⁵ course as 'CRAI DOCENCIA,' which is to say, staff who guaranteed that the online system worked correctly. Consequently, Group A comprised 50 students. The second group, which we shall call Group B, was a bit larger, containing 60 students (as well as the two instructors and staff from CRAI DOCENTE).

On February 2, 2012, provisional grades for both groups were published. Although some final corrections of errors would later be made, for all extents and purposes, the academic component of the semester had ended.

The two groups seemed to be similar; as per information provided to the instructors by the university's computer system, students in the two sections had comparable ages and academic backgrounds. The curriculum for both courses was identical. Group A attended lectures during the second block of morning classes, while Group B met during the third morning block. Each group met twice a week.

The main topic of the courses was the Teaching of History to pre-teens. In the Spanish educational system, this entails students in Primary School (EP) and Obligatory Secondary School (ESO).⁶

Given their similar make-up, the authors of this study decided to compare how both groups interacted with the subject matter and how we, their professors, interacted with the groups of students. Furthermore, the study aimed to assess which concepts, resources, teaching skills and choices were most appealing and effective (and consequently, best received by students). Needless to say, these results would also prove important when planning future courses.

To conduct this study, we opted to use the tools and teaching support that the university provides to all professors and students; namely, the Moodle platform.

STUDY PURPOSE AND GOALS

Obviously, there are numerous reasons for a study of this nature. However, we chose to undertake this project

due to the size of our classes. With 110 total students, it was nearly impossible to design differentiated educational programs for every student; these class sizes also required us to use much less effective teaching methods. Indeed, it is quite difficult to engage in debates in the classroom and stringently monitor every student with student-teacher ratios such as these. Consequently, from the very beginning of the course we considered which topics would be most interesting and which would be least appealing to students. We also sought to determine the effectiveness of the strategies we adopted. Were our teaching approaches and strategies effective? Which were most effective?

A second motive also led us to conduct this research project: we did not know our students and had no information on their background or how classes had been assigned.⁷ If one group were to achieve better results than the other (measured by better grades or some other indicator), what would have led to these differences? Were the groups assigned at random? Did some criteria used when assigning classes impact academic performance? What had the most decisive impact on results? These questions prompted us to conduct this study.

At the beginning of our research, precise goals were not outlined, since the project took shape as we designed and prepared the course materials and during the first classes of the semester. However, later on the goals of our research were stated. Specifically, the project aimed to:

- Determine if any factors played a significant role when assigning both groups, and, if so, determine what they were;
- Identify behaviors, attitudes, and learning styles which differed between Group A and Group B, if applicable;
- Determine whether student motivation about the subject matter and course is random or whether it can be linked to specific factors;
- Discover which topics and/or activities from classes were most motivating or led to the greatest increase in knowledge and which were least successful, and search for potential causes for this;
- Determine whether there is a cause and effect relationship between attendance and grades; and
- In light of the aforementioned goals, strive to improve or change those practices, exercises, explanations or activities that were least successful.

Though they are modest, these six goals nevertheless play a vital role in improving the mistakes that are an inevitable part of teaching.

INITIAL CHALLENGES AND STUDY RELEVANCE

This study faced some initial challenges of an organizational nature as the number of students prevented us from comprehensively tracking each student, especially in light of the fact that we were also responsible for teaching other courses. We also aimed to conduct the study without changing the normal flow of the class, adding new elements, modifying the curriculum or giving more exams than would be typical in this type of course.

The second challenge of this study entailed determining the scores or grades with which students had gained access to these degree programs and the paths students had taken to arrive here, since the Spanish university system can be accessed in various ways.⁸ An easy solution to this problem was quickly found, since the University of Barcelona's Educational Planning Division was able to provide the scores each student had received on university entrance exams in addition to information on their backgrounds and the ways in which students had gained access to this course of studies.

Nevertheless, we tend to face a real problem when comparing these groups of students: there is a marked difference in their learning and academic performance. In fact, in previous courses we had noted that some groups obtained much higher grades than others. This was the case even when teaching other courses, e.g. 'Teaching of Social Sciences' rather than 'Teaching of History' and was the fundamental issue we considered in this project. Are there factors that explain these academic differences? Why were results from one course always better than results from another? Were students assigned to courses in a manner that was not strictly random? It goes without saying that the answers to these questions would help to alleviate or solve these challenges.

HYPOTHESES

The following factors may be responsible for variations in end-of-semester grades from group to group and year to year:

- Scheduling: Some 'Teaching of History' classes may be offered during better time slots (e.g. before the mid-morning break) or in less advantageous slots (after the break);
- Entrance exam scores: Some groups may be composed of students who received significantly higher scores on the university entrance exam, which we assume would decisively impact academic performance;

- Different means of access to the course: There are several ways to get into the degree program. Most frequently, students access this course of studies by passing the university entrance exams (PAU, *Prueba de Acceso a la Universidad*); this exam is taken by students who have completed the *Bachillerato*⁹ in Spain. Students can also enter this degree program after having completed a vocational education program (a *Ciclo Formativo de Grado Superior* or 'advanced vocational training program'). Finally, a small but relevant number of students also enter this course of studies in other ways — for example, by changing degree programs, taking an exam designed for individuals over 25 years of age with no prior studies, having received a degree from a foreign university, or by transferring from another university;
- Classroom: The two classes are conducted in quite different spaces, since Group A's classes are held in a large, square room, while Group B attends class in a long, narrow room, making it difficult to split students into groups;
- Age: Although students are studying in very similar settings, their ages may be different; and
- Other factors related to group dynamics.

Of course, a variety of other factors could play a role in academic performance, but we have chosen the aforementioned elements since they can be measured and assessed using statistical tools.

Before considering the most plausible hypotheses, we discarded those that were least likely. For example, scheduling seemed unlikely to have a significant effect on results, since both classes were offered in the morning; consequently, we decided to bear scheduling in mind, but assumed it would have a limited impact on performance. Furthermore, although classroom layout certainly played a role in classes, it was likely to impact only a small number of students, namely those in the last rows of the classroom with a long, narrow layout. Although these factors might be significant on an individual basis, they were unlikely to explain global differences in learning.

In light of the foregoing, the most plausible hypotheses were those related to entrance exam scores or means of access.

Although both *Bachillerato* and vocational programs (*Formación Profesional*) are part of Spanish secondary education, their courses are quite different: the former tends to focus on theoretical knowledge while the latter stresses applied learning. Students and schools generally vary significantly, which could also impact performance. Of course, entrance scores could also be quite relevant, since they include not only results from the university

entrance exam but also factor in the student's secondary school grades.

The last factor that may impact performance is related to group dynamics. This is quite difficult to measure, since it can include items which are hard to quantify such as leadership, positive relationships or rivalries, the way students interact outside the classroom, internal cohesion, and more. Consequently, these complex factors should only be considered when all other factors have been clearly ruled out.

TEACHING OF HISTORY: A THEORETICAL BACKGROUND

Teaching of History is designed for students who will mainly work in primary schools, which is to say, those who will teach children ages 6 to 12. Nevertheless, although current Spanish law has set these age limits, the Teaching of History course bears in mind the fact that teachers are professional educators who should be prepared to teach students of ages that might differ from those set out by current law. Indeed, laws may change but the profession of teaching does not; furthermore, our students may teach in other countries, where age cutoffs may differ. Consequently, the course was designed to prepare instructors to teach pre-teens and adolescents, e.g. individuals up to about 15 or 16 years of age.

The course lasted one semester and included 15 thematic units.¹⁰ In addition to the 15 weeks of classes, the course included 3 weeks to present projects, offer seminars and other activities outside of class hours, and take final exams. Since each group attended two classes per week, the course included a total of 30 sessions covering theory and practical applications.¹¹ Six assessment sessions and seminar classes, where students could prepare for exams or present projects and classwork, were also offered to smaller groups.

The course was organized as follows:

MODULE 0: Introduction to the Teaching of History

MODULE 1: Why teach history to children and teens?

MODULE 2: Teaching history in light of student needs and abilities

MODULE 3: Purposes and goals of teaching history

MODULE 4: Teaching students to formulate hypotheses about the past: The hypothetical-deductive method

MODULE 5: Teaching students to analyze physical sources: Objects and the inductive method

MODULE 6: Teaching students to analyze written sources: Text study

MODULE 7: Teaching students to analyze oral sources: Interviews and questionnaires

MODULE 8: Teaching students to analyze multimedia sources

MODULE 9: Art as a source in history¹²

MODULE 10: Introduction to critical analysis of sources

MODULE 11: Causality: Causes and reasons

MODULE 12: Change and continuity: Discoveries, inventions, innovations and acculturation

MODULE 13: Stories and tales as teaching tools

MODULE 14: Creating timelines

MODULE 15: Walking in the footsteps of the past

Course goals were clearly formulated, and can be summarized in the following three statements:

- Provide a methodological framework for teaching history, which entails teaching students 'how to do it';
- Reflect on what history should be taught; and
- Acquire experience in creating educational activities for teaching history.

The course **methodology** can be summarized as follows:

- Presentation of topic by instructors.
- Analysis of objects and/or miscellaneous materials: Primary and secondary sources.
- Debate on the most interesting points that were put forward.
- Brief presentation of educational activities to take place outside of class using the Moodle.

Student work was **assessed** using three categories, in each of which students could be awarded a maximum of thirty points:¹³

- Activities related to the learning of history were submitted by students (individually or in groups of up to 3 students). The maximum number of activities that could be turned in over the course of the semester was 15 (one per module). Each student could select the number of activities he or she wished to submit, bearing in mind that each activity could receive a maximum score of 0.66¹⁴ and that at least 8 activities had to be submitted in order to pass the course (presuming each of these activities received the maximum score of 0.66).
- A written exam worth a maximum of 30 points was given in the month of January. All students completed this exam at the same time and in the same room. Students were permitted to bring any materials they wished (including computers with internet access) to this exam, which was assessed individually and consisted of applying knowledge gained during the semes-

ter to educational contexts. The possibility of administering a multiple-choice test was left open.

- Attendance and participation in the virtual classroom were assessed.¹⁵ The maximum number of points for attendance was 30, which correspond to the number of class sessions. Since attendance was taken 6 times during the semester, students who were present during each of these 6 classes received all 30 points, and other students received a proportionally equivalent score.

Final grades were calculated by averaging scores for the aforementioned criteria.

An underlying tenet of this course is that Teaching of History is an applied subject; consequently, bibliography and articles for debate were provided in each of the thematic units. Nevertheless, we are aware of the fact that nobody can teach that which he does not know. A prior knowledge of the subject matter is required to teach history; in light of the diverse means of access to the program, this was not completely demonstrated on university entrance exams.¹⁶ Consequently, we recommended that students read additional materials to fill holes in their knowledge. Students with particular difficulties in the field of history were encouraged to read the core biography in order to master the basic information required to teach this course. In any case, these contents could not be covered in this pedagogy course, which, as we have noted, was limited to 30 90-minute sessions.

Naturally, a note about this last comment is in order. Not all students who enter university-level teacher training courses do have the same knowledge of history; some of them will have studied history in secondary school or other courses and will have a basic knowledge of the field, while others will only have studied history in primary school, and will consequently have a very poor knowledge of the subject which makes it quite difficult to succeed in a course such as the Teaching of History. This brings up a key pedagogical principle that is often forgotten: nobody can teach what he or she doesn't know.

The main idea of the Teaching of History course is to encourage students to learn how to conduct deductive hypothetical thinking.¹⁷ Between ages 6-7 and 15-16, students develop deductive hypothetical reasoning skills. Without a doubt, pre-teens and teens need to hone these deductive hypothetical thinking abilities and automatically apply them to daily situations. If taught properly, history can be a powerful ally in this task. In fact, history requires interpreting the past; and in making deductions about and analyzing the causes and consequences

of events, students will inevitably formulate hypotheses, since historical knowledge is, above all, hypothetical.

Proving what happened in the past is always a challenge. When faced with any kind of fact, a historian brings together all available sources, analyzes them, generates hypotheses designed to explain or interpret the facts, and attempts to prove these hypotheses. However, she rarely succeeds. The heart of historical research is, quite fairly, the documents on which hypotheses are based.

It is precisely during schooling that the need to clearly demonstrate deductive hypothetical thinking emerges. Consequently, from the point of view of mental development, teaching history carries out this goal.

Of course, in history teaching that is focused exclusively on memorization, both instructors and the discipline itself fail to take advantage of one of the most important possibilities available to them.

Teaching students to formulate hypotheses is a complex task, but it can be achieved by means of concrete research carried out in museums or published in history journals. For example, when considering a mummy (about which we already know sufficient information), the task consists of guiding the student through a series of historical possibilities based on simple questions. *Who was this? Was it a man or a woman? How old was this person when s/he died? What was s/he like? What kind of clothing did s/he tend to wear? What do we know about the causes of his/her death? Are there other mummies like this one that we can consider?* In addition to this series of questions, we also need to provide the students with guidelines for analyzing the facts, tips for researching which will help them formulate a coherent hypothesis that may or may not agree with the hypothesis offered by the museum of journal. In any case, at the end of our study we need to review our conclusions.

While educating teens to formulate hypotheses is one key goal of history teaching, another point — as mentioned — is developing and structuring critical thinking. Pre-teens and teens often exhibit behaviors which underscore their need to engage in this kind of mental activity: sometimes they act like unruly rebels and nothing is enough for them; the adult world they are surrounded by seems absurd to them. These kinds of adolescent behavior often camouflage a need to develop critical thinking. How can we help students develop these kinds of thought processes? Naturally, without critical thought, history is simply a legend. The source material of history — whether written, spoken, multimedia, or artistic — is not always

true; papers, statements, letters, reports, speeches and other kinds of written communication — the materials with which we reconstruct the past — reflect the interests of the individuals who produced them. These are often influenced by the circumstances in which they were written; frequently, they simply twist the truth.

Without critical analysis, history would not exist. Consequently, to teach and foster historical learning, we must stimulate critical thinking. Along these lines, when educators do not teach students to critically analyze sources, they are not teaching history but simply are imparting a mythical and frequently adulterated version of the past.

Consequently, history should serve these two main purposes when educating adolescents. Critical thinking in history can and should be developed based on basic textual criticism; in these cases, analysis consists of considering questions like:

Who wrote this? Who was it written for? Why was it written? Where and when was it written? What camp, faction, or ideology did the author(s) of the text subscribe to? Each and every one of these questions, which underpin a critical analysis of texts, is a crucial part of the methodology that schools must teach.

The skills that we have mentioned make up a key part of history's role in educating; nevertheless, the discipline can go much further. History is always interpreted by the person who analyzes it, and these explanations can be quite subjective. Even our own history, our personal history, is explained quite differently by different people. The same facts sometimes lead to quite disparate interpretations. Consequently, there is no one true version of the past; in truth, history is multifaceted. We are all looking at the same multifaceted gem, but history appears to be different when examined through these different facets. History can be analyzed through diverse lenses, and even when analyses seem to differ, they may reflect reality, which is to say, they may be true. Herein lies the most important role of history in education: teaching that there are various versions of any situation, and that before ruling out an explanation, we need to determine whether it represents a falsehood or simply another different, yet equally true, perspective. The same event can be analyzed in different ways by people of different nationalities or social conditions.

The same event is also different when viewed through the eyes of an employer or employee, and we must bear in mind that these two individuals have quite different worldviews and takes on reality. We must understand that

the two coexist — and students need to appreciate the ethics or morality of their reasoning — yet this kind of approach is part of the framework of ethics and morals of judgment rather than history. When learning about history, students must be taught that events can be analyzed from numerous points of view and that each of these can be valid, even if we find them morally offensive or unacceptable. The goal of history is to understand the past, discovering the reasons and motives why we humans acted in a given way.

Consequently, this course aims to set out an analysis-based method for teaching history. This is not new: it is based on methods and strategies which have been known to historians for quite a long time, yet which have often not been part of the intellectual experience of primary or secondary school. Naturally, this teaching method entails presenting students with a series of concepts, abilities and processes that are an integral part of history. One of the most interesting elements in teaching history may be getting students involved in the processes of analysis and research which are part of the discipline. This entails teaching students to:

- Formulate questions about the present and the past;
- Make deductions about basic facts, causes and consequences;
- Extrapolate historical situations;
- Assess available information;
- Interpret facts;
- Sort and contrast sources;
- Question positions or explanations about facts;
- Propose hypotheses;
- Distinguish between primary and secondary sources;
- Distinguish between fiction and opinions; and
- Detect bias.

Each of these skills and processes is part of history; some may be exclusive to the field. The discipline is based on analytical methods which may vary quite significantly, although essentially, they do not differ from the general methodology utilized in science to analyze phenomena, e.g. from the phases which can be laid out as follows:

- When faced with a question, problem or enigma, try to determine what others have said or how they have responded;
- If these answers are unsatisfactory, go back to the primary sources related to this topic;
- Based on these sources, propose hypotheses which aim to explain or resolve our initial questions;
- And, of course, there are many types of sources we need to teach students to work with in schools, from

materials to texts to images to oral histories to stories and more. This is the foundation of this teacher-training course;¹⁸

- To prove or validate a hypothesis, we need to seek new sources;
- Sources need to be sorted so that they can be used;
- Sources need to be critically analyzed and verified;
- At the end of the process, we need to set out the conclusions from our research, detailing weak points, e.g. what we were unable to prove or resolve.

Of course, in addition to telling students about the past, schools should emphasize the reasoning system and the method by which these stories are constructed over the course of the semester.

Finally, students of teacher-training programs need to be taught that history does not provide answers, but rather, generates questions, and that history is a powerful ally in learning about ourselves as a social group. Nevertheless, history's responses always answer questions: what happened, how it happened, and why; learning about the reasons for a human action in the past and differentiating these from the causes which set off a series of events is part of the task of history. And this should also be part of the curriculum.

Teaching teens how to ask questions may be a teacher's most difficult task.

For centuries, the task of teachers has been to teach students to respond to questions that were asked them. Today, in the internet era, simply finding answers using an online search engine is not the most important goal. Rather, it is for students to learn that which cannot be found online, which often consists of coming up with questions. It is easy to find out when Columbus discovered America or when the Turks conquered Constantinople, but it may be more difficult to come up with questions about these events. And history is a field that, like many others, is responsible for teaching students to discern which questions are possible and which are not, which questions have answers and which lack them.

Indeed, historians can always ask about the causes behind facts and try to differentiate these from the motives that underlie our actions. Causes and motives always lead to justifiable questions, with or without answers; however, history, like all of the social sciences, can never answer questions about that which never happened.

ASSESSMENT TOOLS

The main assessed element in the course was based on 15 activities that students submitted during the term. These activities were primarily done in groups of two to three, although students also had the opportunity to do these individually.¹⁹

Activity 1 entailed taking a position on the current educational curriculum; students had to determine where the curricula for natural and social sciences referred to the goals of history.

The second activity was related to this; students had to try to determine student abilities and needs at this age, and the task consisted of identifying which of these needs and abilities could be linked to history teaching and learning. Concretely, the exercise required students to reflect on the educational goals of this subject.

The third exercise asked about the scientific purpose of history; in particular, it strove to have students understand the analytical method in the concept of the discipline so that they could later teach it to their students.

The next two exercises tried to teach students to formulate hypotheses, first through a 'detective' simulation and later through real research into historical events.

The sixth activity was related to discovery learning; students had to analyze a text by neuropsychologist Howard Gardner.²⁰

The next three activities focused on analyzing and classifying sources. Activities 7 and 9 referred to material sources and presented teaching through objects to students.²¹ Activity 8 was a simple exercise where students had to apply what they had learned using exercises from school textbooks.

Activity 10 entailed creating a small dossier of sources extracted from a short handbook about the Late Roman Empire; it included objects as well as artistic and textual sources.

Exercise 11 was a bit complicated, as it entailed making critical judgments based on primary and secondary sources related to a controversial case: the death of Emily Davison in the famous 1913 Derby;²² we had previously worked on this in groups during one session of class.

The next exercise, Activity 12, dealt with oral sources, asking students to prepare an interview about a predetermined topic and period.

Activity 13 focused on audiovisual sources, a product of the 20th century; students had to select clips from a historical television series and analyze them using an analytical framework designed to foster critical judgment skills in schools.

Activity 14 focused on the topic of time and asked students to create timelines based on a significant local topic like clothing; it was a relatively simple research exercise (focusing on citations) given the ease with which students could access images of clothing over time.

Finally, the last activity was an introduction to play in education wherein students had to invent or adapt two games based on historical facts; when possible, one was to be a board game and the other a computer game.

These fifteen activities comprised one third of the final course grade, while a second third was based on an exam. Students were encouraged to bring as many materials as possible to this exam, where they had to draw up an outline for teaching medieval history to children aged 10 to 12 in primary school. The goal was for students to utilize the resources we worked with over the course of the term and to demonstrate their understanding of strategies related to learning and teaching. These could include games, stories, object-based teaching, the formulation of hypotheses, the classification of sources, visits to historical sites, etc. The second question on the exam focused on teaching through primary sources in the form of objects. In this case, students were given a set of four replicas of Roman-era medieval instruments from a museum in the province of Barcelona.²³ The activity was similar to one students did in class, and required a knowledge of how to work with material and textual sources, since the medical instruments provided to them could be complemented by looking for information from *On Medicine*, by Roman author Aulus Cornelius Celsus. This question tested the extent to which students had acquired the ‘methodological basis for teaching history’, which was the primary objective we set out for this school year.

As noted earlier, the last third of a student’s grade was based on attendance. Attendance was taken at random rather than on a daily basis; in our opinion, taking attendance at random allows the students some freedom in their decision-making yet nevertheless tends to be significant.

Furthermore, students who believed they would have a high grade based on these three assessment criteria were given the possibility of completing an additional activity in order to obtain the *matrícula de honor*, the highest

honor in the class, which could be awarded to only one student in every twenty. Consequently, based on enrollment in our classes, this could only be given to two or three students. This activity could never lower a student’s grade and was an optional individual exercise wherein students had to create a very short audiovisual presentation using historical sources and *Windows Movie Maker*; students who were not familiar with this simple, free tool for editing images were offered the chance to attend an introductory lecture on the program.²⁴

These were the primary tools used for assessing students, although we also looked at students’ work in the Moodle, the number of posts made and time students spent connected to the campus (which we could quantify using electronic tools), and the visual observations instructors typically make over the course of the semester. We did not include meetings, conferences, and similar settings; although these can be relevant, they were not directly related to our assessment criteria.

METHODOLOGY AND TOOLS

The study naturally demanded a quantitative methodology, with two types of quantification: descriptive and, more importantly in our case, analytical. Quantitative analytical methods always present the most challenges and our research proved no exception. Our fundamental mission was to establish a comparison between variables in the two study groups, despite the absence of a control group for reasons previously noted. The aim was to analyze as many variables as possible, as they became apparent in each group, although the only variables we actively envisaged and took into account were scheduling, entrance exam scores, different means of access to the course, the classroom space, the age of students and factors related to group dynamics. Our working hypothesis was that means of access to the course and entrance exam scores would probably be the key factors in explaining the differences identified between the groups. Nevertheless, we were also aware that breaking down social reality into variables can produce a splintered picture, potentially undermining the results.

The Moodle platform was one of the main tools we utilized to apply our methodology. It is actually a program which is part of the University of Barcelona’s online campus. The information stored by this program allowed us to gather precise data on the activities each student did throughout the course. We also used Microsoft Office Excel (Windows edition) spreadsheets to process numerical information.

Data available for each student included:

- Weighted university entrance scores and means of access; this information was provided by the registrar's office in the University of Barcelona's Teacher Training Faculty.
- Attendance records collected by the instructor.
- Record of all activities submitted through the online campus.
- All optional activities submitted by students to increase their average grade.
- A recording of a required 90-minute exam at the end of the course in which students could use any materials they deemed necessary, including the internet.
- Records for the total number of posts made by each student on the online campus, the topics they viewed, and the amount of time spent connected to the classroom.
- Observations of student attitudes, participation and classwork.
- Data about each student provided by them in the online campus or provided by the program itself.

These data were analyzed and tabulated in order to find answers to the questions set out at the beginning of the study and especially to shed light on the study's main hypotheses.

PHASES AND TIMING

The **first phase** of this project entailed preparing materials for the course. Specifically, the following steps were taken when preparing materials for the two courses that were taught:

- 1) The 15 modules that make up the course were generally prepared beforehand. Each module contained a Powerepoint presentation with a series of at least 10 slides that included highly visible graphs and images. These followed a simple structure: each slide contained one or more images which evoked the main idea that was discussed in class. These materials were published before class sessions in the virtual campus so that students could read, view or print the presentation before class.
- 2) A complementary bibliography was also prepared for each module. These suggested readings were published on the online campus whenever possible; references were provided for copyrighted materials which could not be published on the campus.
- 3) Furthermore, special teaching kits were made up for some modules. For example, materials were prepared for a 'detective' simulation wherein students had to analyze the bag which a girl had supposedly left be-

hind in order to learn more about its owner; students also had to conduct a detailed study of trash bags and write up reports about the individuals who supposedly 'filled' these trash bags.

- 4) Since history teaching inevitably requires the use of primary sources, approximately one dozen different kits containing a variety of primary sources were created. The materials contained therein spanned the gamut and included medieval armor, Roman-era medical equipment, working models of steam engines, human bone remains from the medieval period, tools for conducting measurements and orienting oneself from various periods, prehistoric materials, and more.
- 5) Exact replicas of printed primary sources were also created. These included parchments and scrolls, accounting records, banknotes, reports, newspaper articles, and more. For some sessions, folders or boxes of materials focusing on a common theme were created so that students could analyze and study real cases.
- 6) Teaching and learning materials that would be provided to students throughout the course were prepared.
- 7) Finally, two trips were planned: one to a pre-Roman archeological site (the *Ciutadella Ibérica de Calafell* in Tarragona) and the other to explore the topography of Roman and medieval Barcelona. The goal of these trips was to illustrate the last course module: walking in the footsteps of the past.

The **second stage** consisted of the course itself. It goes without saying that this was the most important component of this course. During this stage, it was necessary to modify some of the activities that had been planned, add or remove materials from the kits and bibliography, etc. Of course, attendance was taken (a total of six times).

Most classes began with one of the two professors introducing the topic and moved on to an analysis of the primary sources or kits. Finally, a debate or question and answer session was held.

In each session, students were told which materials had been published in the online campus and student questions about these materials were answered. At no point was it possible to provide feedback on the work students had done. This fundamental part of learning was made impossible due to the large number of students in the courses and probably impacted final results. However, such feedback would have entailed using classroom time in a way that would have prevented the course from staying on schedule.

The **third phase**, which took place during the last few weeks of the course, entailed providing more individual-

ized feedback to students in order to answer questions about activities that had not been submitted and exercises that would be assessed. This phase also included the two aforementioned trips as well as a session focused on using and working with primary and secondary sources for audiovisual purposes. Lastly, this phase included the final exams, where students could use any materials they deemed necessary, including the internet; this was done in order to determine if students had acquired sufficient experience in creating materials for teaching history (the third objective of the course). Logically, the course ended when grades were published and students had the opportunity to request revisions of their final marks.

During the **fourth phase** of the project, all of the information that had been collected was processed. Data was tabulated using Excel spreadsheets and results were analyzed and compared to check the hypothesis. Based on results, suggestions were drafted for modifying future courses. Finally, this report was drafted.

STUDENT PROFILE

From a sociological point of view, the groups were relatively homogeneous, both in terms of age and in terms of background and social class. In Group A, 39% of students resided in Barcelona; this was the case for a slightly lower percentage of the students in Group B, 31%.

Consequently, in both classes the majority of students resided in surrounding areas; no particular place of residence stood out from the others. Logically, the large majority of these students resided in what can be referred to as Barcelona's 'hinterland', which is to say in the Maresme and Baix Llobregat regions; however, this was not statistically significant. Perhaps slightly more students in Group B came from rural areas, although this is strictly an assumption based on the relative numbers of students from some of the cities of residence.

In both groups, the virtual campus was used relatively little. This was slightly lower in Group A than in Group B, with percentages of students using the virtual campus very frequently of 10.5% and 12%, respectively. However, Group A also had a higher percentage of students who barely used the virtual campus (27%) than Group B (18%). This means that students in Group B entered

and viewed the virtual campus a good deal more than those in Group A. The vast majority of students in both classes entered the Moodle from time to time. Of course, these results should be interpreted cautiously, since some students log into the online classroom and download and print hard copies of the documents. Consequently, when taken individually, data about use of the online classroom could be deceiving; nevertheless, when viewed globally, these results are relevant, since students who enter the online campus infrequently will find it difficult to respond to questions or participate in debates. Consequently, on a global level it can be stated that the students in Group B were more active than the students in Group A, which might indicate more work and better final results.

The gender breakdown of groups was quite similar; both groups had more females than males, which is quite frequent in degree programs of this nature in Spanish universities; the University of Barcelona is no exception.

Generally speaking, students were polite and well-behaved.

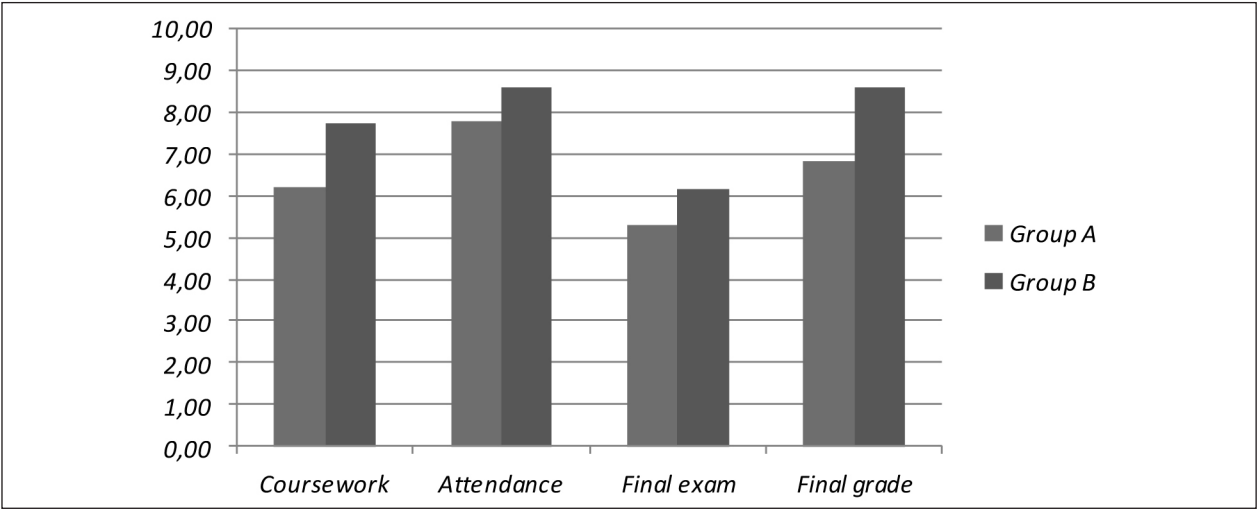
Although an initial assessment of historical knowledge was not conducted, it is generally understood that levels were quite low; significant interest in being good educators was thought to make up for this lack of knowledge. Indicatively speaking, however, it should be noted that 70% of the students in Group B and 62.6% of the students in Group A studied materials before class infrequently, e.g. once a week.

RESULTS AND ANALYSIS

The average final grade for Group A was a 6.85 (out of 10). This was calculated based on the average for activities submitted during the course (6.21), the average grade on final exams (5.3), and average attendance (7.8).²⁵

The average final grade in Group B was 8.58, nearly two points above the average for Group A. Students in this group received average scores on activities, final exams, and attendance of 7.76, 6.14, and 8.6, respectively. The results indicate that Group B clearly outsourced Group A in terms of ongoing work, final exams and attendance, with differences of 1.73, 0.84, and 0.8 points, respectively. This is shown in Graph 1.

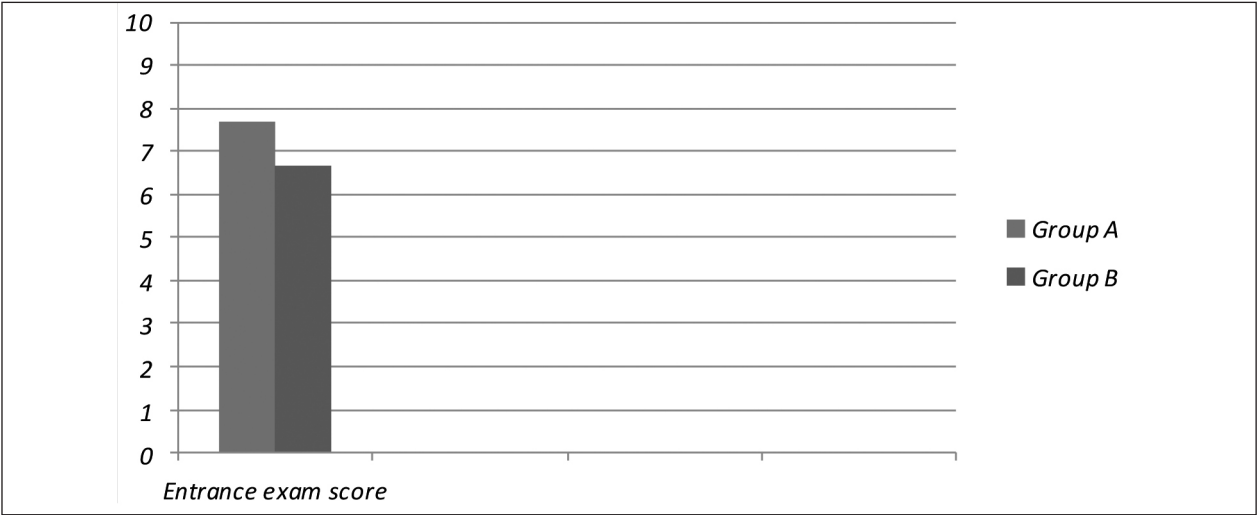
Graph 1. Comparison of groups on course assessment metrics



In accordance with our hypotheses, we analyzed whether these differences might be directly correlated to scores on entrance exams. Group A had an average score of 7.70 on these exams while Group B had an average score

of 6.69; the difference between these scores was consequently 1.01 points. These figures were clear enough to rule out the initial hypothesis.

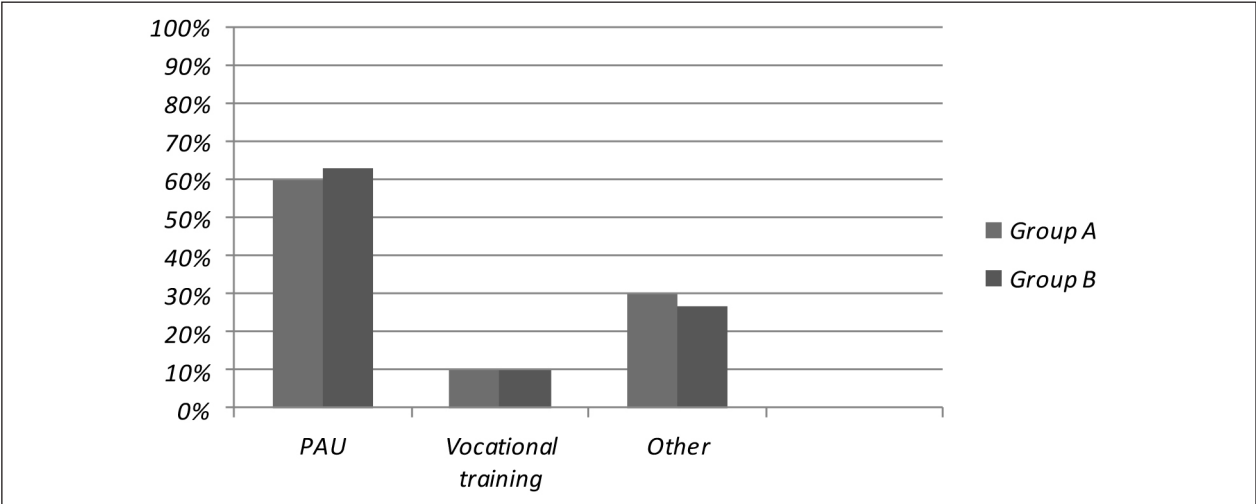
Graph 2. Comparison of scores on university entrance exams



The means of access to degree programs was also not statistically significant. In Group B, 49 students took the normal university entrance exams (PAU) and only 6 came from vocational training programs; in Group B,

these numbers were 42 and 5, respectively. The remainder of students entered the program through a variety of paths and were statistically insignificant.

Graph 3. Means of access to the Degree in Primary Education



Consequently, the main hypotheses of this study were ruled out. Based on these data, it could not be demonstrated that differences in results between the two groups stemmed from scores on entrance exams or the means of access to the degree program. Of course, it was confirmed that students who excelled on entrance exams also excelled in the course; this correlation was frequent but not constant. It should also be noted that Group A generally got lower grades than Group B; nevertheless, on some course activities (related to formulating hypotheses, preparing oral interviews, etc.), Group A scored higher than Group B. Nevertheless, Group A's final grades were lower.

CONCLUSION AND CRITICAL ASSESSMENT OF RESULTS

Although our hypotheses seemed to reflect the most logical causes behind differences in final grades, this

study did not confirm these hypotheses. Due to results, entrance exam scores, means of access, timing, age and classroom were all ruled out. Consequently, it seems that the final possibility noted above, namely group dynamics, might be the root of differences. These kinds of factors are quite difficult to measure, since they include elements we previously described as 'leadership, positive relationships or rivalries, the way students interact outside the classroom, internal cohesion, and more' (see HYPOTHESES). It seems that these factors must have had the most decisive impact on final results. However, these elusive yet important factors cannot be measured using standards-based assessment systems. Studying them requires in-depth, qualitative research and the analysis of case studies. Consequently, this study underscores the complexity of studying differences in results and the need to pursue such research using both qualitative and quantitative methods.

NOTES

¹ Universidad de Lleida. Departamento de Didácticas Específicas. Facultad de Ciencias de la Educación. Doctora en Didáctica de las CCSS y del Patrimonio por la UB ha trabajado en proyectos y grupos de investigación del ámbito de la museografía, la didáctica del patrimonio y de las ciencias sociales y el turismo escolar. Es directora de la revista *Her&Mus. Heritage and Museography* y de la *Colección de Manuales de museística, patrimonio y turismo cultural* (Ed. Trea). Es autora, entre otros libros, de *Museo local. La Centenaria de la cultura*, *Claves de la museografía didáctica* y *Manual de didáctica del objeto en el museo*.

² Universidad de Barcelona. Departamento de Didáctica de las Ciencias Sociales. Facultad de Educación. Investigadora del grupo

DHIGECS y coordinadora del Taller de Projectes, donde desarrolla investigaciones vinculadas a la didáctica de la historia y del patrimonio, la museografía didáctica e interactiva y el uso de las nuevas tecnologías para la educación. Es autora de diversos artículos científicos en revistas del ámbito de la educación y el patrimonio como *Íber. Didáctica de las Ciencias Sociales*, *Educatio siglo XXI* o *Her&Mus*, así como autora en distintas obras colectivas de la editorial Trea, destacando *La cultura museística en tiempos difíciles*.

³ Universidad de Barcelona. Departamento de Didáctica de las Ciencias Sociales. Facultad de Educación. Investigador del grupo DHIGECS y director del Taller de Projectes, con una larga trayectoria en la investigación y la docencia en didáctica de las ciencias

sociales y del patrimonio. Investigador principal del Proyecto I+D «Musealización de espacios patrimoniales a partir de aplicaciones reactivas con contenidos multiplataforma: telefonía móvil y superficies táctiles». Es director de la revista *Her&Mus. Heritage and Museography* y de la *Colección de Manuales de museística, patrimonio y turismo cultural* (Ed. Trea). Es autor, entre otros libros, de *Museo local. La Cenicienta de la cultura*, *Claves de la museografía didáctica*, *Manual de didáctica del objeto en el museo* y *La cultura museística en tiempos difíciles*.

⁴ The University of Barcelona's Degree in Primary Education included 7 groups of students, 4 of which studied in the mornings and 3 of which studied in the afternoons. The program, which comprises 240 ECTS credits, is part of the Department of Social and Legal Sciences (*Ciencias Sociales y Jurídicas*).

⁵ Moodle is the virtual teaching platform used by University of Barcelona. Professors used this online space to provide students with materials and resources.

⁶ In Spain, Primary School (*Enseñanza Primaria*) includes students aged 5 to 12, while Obligatory Secondary School (*Enseñanza Secundaria Obligatoria*) is given to students aged 12 to 16.

⁷ The only information we teachers had is that students rank the groups they would like to join; students are assigned to a class based on their grades in previous courses. Consequently, given that the Teaching of History is a third-year course, the students with the highest grades in their first and second year of study would have the greatest chance of being placed in the time slots they selected.

⁸ In order to access an undergraduate degree program at the University of Barcelona, students must: have obtained the *Bachillerato* (or an equivalent degree) and passed the university entrance exams (PAU); or have completed an advanced vocational training program; or have passed the university entrance exams for individuals older than 25 years of age; or meet the admissions requirements for individuals older than 40 years of age. For more information, please see: http://www.ub.edu/web/ub/en/estudis/oferta_formativa/graus/acces_preinscripcio/acces_preinscripcio.html (Consulted, 21st August 2012)

⁹ The *Bachillerato* is a course of studies taken during the final two years of secondary school designed to prepare students for university. It follows ESO (Obligatory Secondary Education).

¹⁰ As per the university calendar, the first semester started on September 19, 2011 and ended on February 2, 2012.

¹¹ Each class lasted 90 minutes.

¹² Due to incidents beyond our control, classes during week 9 were canceled and this topic was omitted. Consequently, the 16 modules (15 modules + 1 introductory module) were reduced to 15 modules.

¹³ Assessment was out of a total of 90 points; students could receive a maximum of 30 points on each of the 3 assessed items.

¹⁴ This value is calculated by dividing the maximum possible grade at the university (10) by the number of activities in the course (15).

¹⁵ Data on use of the virtual classroom included the number of entries, number of views of topics and length of time in the classroom.

¹⁶ Bear in mind that students are not required to take the history exam as part of their university entrance exams at this university.

Consequently, students could enter this university without any assessment of their level of historical knowledge.

¹⁷ The theoretical underpinnings behind teaching history are laid out in detail in, J. & SANTACANA, J. (2011a). 'Por qué y para qué enseñar historia?' (The whys and wherefores of history teaching). In J. PRATS et al. *Enseñanza y aprendizaje de la Historia en la Educación Básica* (Teaching and learning history in primary school) (pp. 21-72). México D.F.: Universidad Pedagógica Nacional. See also PRATS, J. & SANTACANA, J. (2011b). 'Los contenidos en la enseñanza de la Historia' (Content in history teaching); 'Métodos en la enseñanza de la Historia' (Ways of teaching history); and 'Enseñar a pensar históricamente: la clase como simulación' (Teaching historical thinking: The class as a simulation). In J. PRATS (coord.) *Didáctica de la Geografía y la Historia* (Teaching geography and history) (pp. 11-85). Barcelona: Graó.

¹⁸ For an analysis of primary sources in history teaching, see our work in PRATS, J. & SANTACANA, J. PRATS, J. & SANTACANA, J. (2011e). 'Trabajar con fuentes materiales en la enseñanza de la Historia'. In J. PRATS (coord.) *Geografía e Historia. Investigación, innovación buenas prácticas* (Geography and history: Research, innovation and best practices) (pp. 11-92). Barcelona: Graó; PRATS, J. & SANTACANA, J. (2011f). 'Los restos arqueológicos, los monumentos y museos como fuentes del pasado'. In J. PRATS (coord.) *Geografía e Historia. Investigación, innovación buenas prácticas* (Geography and history: Research, innovation and best practices) (pp. 11-92). Barcelona: Graó; PRATS, J. & SANTACANA, J. (2011g). 'La historia oral y los documentos fotográficos y audiovisuales'. In J. PRATS (coord.) *Geografía e Historia. Investigación, innovación buenas prácticas* (Geography and history: Research, innovation and best practices) (pp. 11-92). Barcelona: Graó.

¹⁹ Coursework was designed with a dual purpose: to touch on topics which could not be included in the syllabus due to time constraints but which the instructors believed students could handle individually or in groups and to strengthen the knowledge or processes the instructors believed to be essential.

²⁰ This text was required reading, and one class session was spent debating it. See GARDNER, H. (2000). *La educación de la mente y el conocimiento de las disciplinas* (The disciplined mind) (pp. 133-158). Barcelona: Paidós.

²¹ For an example, see SANTACANA, J. (1995). 'Com treballar amb les fonts de la història a l'escola: exemplificacions i propostes de treball' (Working with historical sources in schools: Examples and proposals). Balma: *Didàctica de les Ciències Socials, Geografia i Història*, 1, pp. 81-90; or SANTACANA, J. & LLONCH, N. (2012). *La didáctica del objeto en el museo* (Teaching the object in museums). Gijón: Trea.

²² Materials designed by the School council of London and adapted into Spanish by Educational Research Group 13/16 were used.

²³ These were replicas of items in the Museum of Badalona (*Museo de Badalona*), where ruins from the ancient Roman city of Baetulo are preserved. For further information see www.museudebadalona.cat (Consulted, 18th August 2012)

²⁴ Guidelines, step-by-step instructions, and ways to use this activity were presented in March 2012 at the *I Congreso Nacional de Investigación e Innovación en Educación Infantil y Educación Pri-*

maria (First National Conference on Research and Innovation in Early Childhood and Primary Education). These can be consulted in MARTÍNEZ, T. (2012). 'Las fuentes de la historia y el recurso audiovisual: una propuesta para la Educación Primaria' (Sources of history and audiovisual resources: A proposal for Primary Education). *I Congreso Nacional de Investigación e Innovación en Educación Infantil y Educación Primaria* (First National Conference

on Research and Innovation in Early Childhood and Primary Education). Murcia: University of Murcia.

²⁵ Average final course grades do not correspond exactly to the three assessed items, since some students who chose to do the optional individual exercise and compete for the *matrícula de honor* saw their final grades increase.

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