

11th IPB Erasmus Week

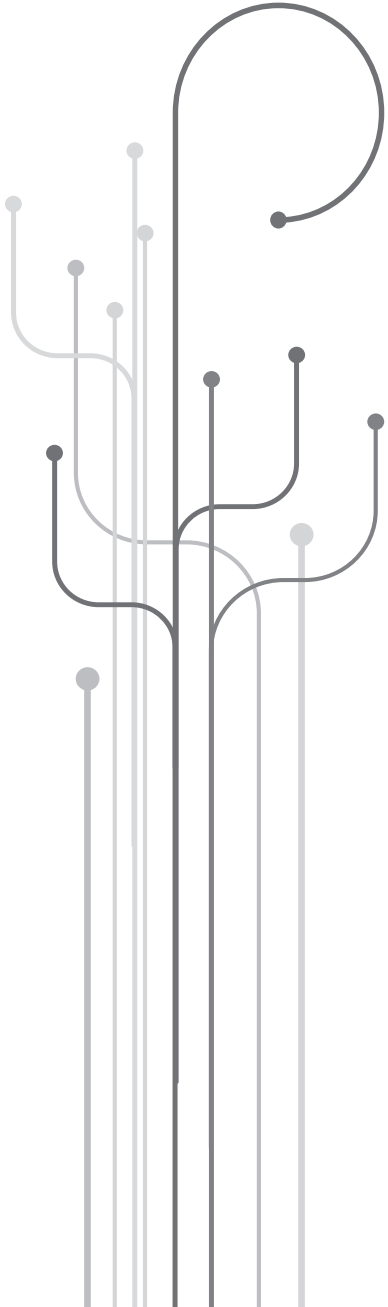
Teaching Crossroads

Edited by

Elisabete Silva

Clarisse Pais

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Preface

Elisabete Silva, Clarisse Pais, Luís S. Pais

The Editors

In the wake of the latest news regarding IPB's award for best Polytechnic Institute in Portugal, we would like to congratulate the IPB community who has always striven for the quality of the institution within the national and international academic milieu. We are, undoubtedly, bowled over by the 1st place in the national context (out of the 27 national institutions under evaluation) and the 7th position in the international scope. In fact, it is worth mentioning that the IPB has won this award, three years in a row, being in a leading position in the ranking promoted and sponsored by the European Union. This year's edition has selected and evaluated over 1300 world higher education institutions.

Teaching Crossroads intends thus to give a watershed contribution to the IPB's successful and most valued pathway. Numbers indicate that *Teaching Crossroads* has had over 2550 downloads since it first came out.

But let's cut to the chase. Once again, we are delighted to present the 5th number of *Teaching Crossroads*. This wholly calculated and well-sustained editorial adventure started in 2012 when the first number of *Teaching Crossroads* first saw the light. This year's publication includes the areas of Human Geography/anthropology, Information Technology and Forensics and Language and culture, focusing on minority languages. Alongside this, as in the two last previous numbers, we've included the specific area for International mobility, Intensive Programmes and Erasmus+ Mobility of Individuals, being the latter financed by the European Union within the Erasmus+ Programme, whereas the former is sponsored uniquely

by the foreign partner institution, in this case, Lillebaelt Academy in Denmark. These types of programmes convey very positive and overarching ideas, resonant in cross-cultural and educational benefits, valuable for all the involved partners.

We would very kindly like to thank the authors for having contributed with much enlightening and serious articles on a wide array of areas.

Pablo M. Orduna Pórtus's article focuses on border culture and heritage management. The author's study is placed on two borderlands of the Iberian Peninsula: Roncal Valley (Navarre) and Riverbanks of Douro. Going beyond the linear or physical conception of the border, the author centres his study on the metaphysical and symbolic ideas of the frontier that sustain his anthropological analysis.

Michal Popdora manages to find evidence for his proposal of a new conception of teaching Image Processing, based on the student-centered approach. A hands-on experience on a Project-based Learning methodology sustains the teaching project.

Grounded on "a forensic-flavored style", using the author's own words, he shows how students can become engaged in a highly effective learning process.

Cláudia Martins is already a confirmed habitué of this publication, as in every Erasmus Week she delivers a lecture on Portuguese language and culture to visiting teaching and non-teaching staff. This time, the author decided to delve into a Portugal's official language, Mirandese, spoken in a small designated area in the northeastern part of Portugal, Miranda do Douro and its surrounding area. The author gives account of some thought-provoking facts about the language, from the origin and the survival of the language, however still a minority language, up to the moment when it was acknowledged Portugal's second official language, together with the challenges that nowadays faces.

Luís Frölen Ribeiro, João Eduardo Ribeiro, Carlos Casimiro Costa, António Duarte, Carlos Andrade from the Polytechnic Institute and **Arne Svinth, John Madsen, Morten Thomsen, Kent Smidstrup, Carsten John Jacobsen** from the Lillebaelt Academy, in Denmark, participate in a joint project which they describe, outlining the main goals and gains of the project. To overcome teaching difficulties regarding the engineering degrees, a 12-ECTS joint course from Lillebaelt Academy and Polytechnic Institute of Bragança was created based on the Danish model. The course Product Development and Industrial Processing was hence created.

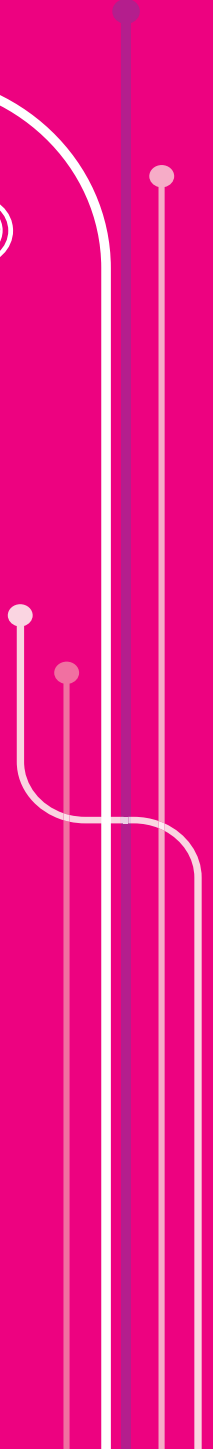
Rui Pedro Lopes presents an insightful and acute account of the Internationalization programmes in Higher Education in Europe. At one go, the author describes his own experience as a visiting lecturer, within the Erasmus+ programme,

to Università Politecnica delle Marche in Ancona, Italy, in a Master's degree in computer science, bringing to light a personal reflection on the goals and benefits of the mobility for both students and teachers. Finally, the author puts forth some suggestions that would improve the whole mobility process.

We sincerely hope to have stimulated you to keep on reading, upholding the belief that these texts can represent valuable sources for both teachers and students in their research work.



Human Geography



The border culture and the heritage management: from the concept to the reality

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Abstract

This paper tries to achieve and increase a depth in the analysis of the concept of border culture. The historic and ethnologic research was already initiated by the teacher in different field and theoretical works carried out with Javier San Vicente and Ester Álvarez. The work was implemented in two borderlands of the Iberian Peninsula: Roncal Valley (Navarre) and Riverbanks of Douro. Through these pages the dissertation will focus attention on the point of the concept of boundary and its anthropological reality. By this way, social and ethno historic concepts of border culture, frontier and peripheral territories will be analyzed. Similarly, a comparative perspective of the identity and the phenomenology of border landscape as growth factors will be set out.

Keywords: *Border culture, Boundary, Iberian Peninsula, Phenomenology of Landscape, Cultural Heritage*

Introduction

Nowadays in the context of the European Union, under the Schengen Agreement, historians and anthropologists ask themselves: How do we see one another in Europe? What is the sense of border, limit, boundary or division in this new continental scenario? That is how, little by little, several issues arise from the epistemological perspective, which lead to an actual assortment of questions (Escamilla, 1999a). European communities, more or less isolated or particular in terms of identity, need to reinforce themselves in a community, and even globalized, context. From the point of view of Social Sciences, it has become essential to redefine the equation of “oneself” against “the other” (Peña & Esteban, 2012, p. 13-16). Trying to decipher the meaning of boundary, a dividing line that drawn in a map or in the mind of a peripheral community defines self-identity, becomes relevant. Such cartographic and political element is able to add similar and intrinsic elements to its own existence and to the existence of the society where it lies.



Figure 1: Cromlech in Organbide in the Pyrenean border between Aezkoa (High Navarre - Spain) and Garazi (Lower Navarre - France). Picture by M^a Victoria Portús

Well, in the midst of the 21st century, is it admissible to have unstable areas within the European Union or its territorial outline? It's clear that on paper, drawing the line, the border or the limit, is something technical meant to create partitions. However, in terms of ethnology and culture, in those borderlands there is a series of “milestones”, “intangible facts” that are used as reference frameworks by the com-

munities living there. This is sometimes done using elements of cultural heritage full of symbolism. That is when the international demarcation that separates the states becomes a cultural umbrella and a tool to build a new human identity: the border society. We will see how in that particular scenery the tangible and intangible heritages converge into something socially and culturally unique and particular. Thus, we can see megalithic monuments of our common ancestors, hermitages or even very old and outstanding trees turned into boundary stones (see figure #1).

The polysemic concept of boundary

As it has already been mentioned, a new anthropological reflection has emerged on the concept of boundary. It might be due to the current moment of socio-economic, and even political-military, instability we live in. Keep in mind that in our own continent economic boundaries have been reopened between the North and the South. Likewise, in East Europe, the state boundaries that resulted from the dismemberment of the former USSR are questioned not only through diplomacy but also through the weapons game. Therefore, in order to understand the meaning of boundary, we must go back to its origins (Orduna, San Vicente & Álvarez, 2016, p. 15-38).

From the human point of view, there has always existed a separating space between “one’s own” and “the other” (Peña & Esteban, 2012, p. 14). Nevertheless, the idea of limit, of the known land, one’s own, explored and exploited land, arose with the establishment of sedentary population groups. As a result, Bottino (2009) talks about the origin of what can be considered “boundary” within a non-political or non-legal context; that is, a boundary which is part of a natural phenomenon of the sociability of the human being. In the midst of the Modern Age, once the Peace of Westphalia was established (1648), it might be said that the idea of a state model in Europe was consolidated. At the same time, that new model of an international map with preset limits exceeded the first idea of the Roman *limes* or the idea of the territories of medieval kingdoms (Vallejo, 2010).

Once the Spanish Civil War was finished and the Second World War was coming to an end, Franco’s regime hurried to build about 10,000 parapets (bunkers, casemates, etc.) along the Pyrenees, in order to isolate his state from the Allied Powers in Europe (see figure #2). However, the project was unfinished and did not succeed, on the one hand, because it made no sense in a world that was already divided into two sides – the “western” and the “communist” –, and on the other, due to the end of the Cold War and the subsequent falling of the Berlin Wall in 1989 (Orduna & San Vicente, 2015, p. 1010-1029). In that moment, Europe seemed to have reached the harmony of unity, which would turn the division of the world in blocks into a memory. It was then when the European Union not only evolved, but also continued spreading its “boundaries” territorially speaking. In that way, the former inner borders –after the Schengen Agreement came into effect in 1995– became, if they

were not yet, converging, meeting and communicating spaces. Such connection between similar but at the same time different realities became political rather than distinctive. Since then, cultural values got rid of Governmental policies and market ties. Bottino (2009) talks us about the reappearance of a series of intangible meanings in nowadays' borderlands. He considers all those meanings a non-stop interaction that gives rise to borderlands where the change, the transition or the breaking with what apparently was established prevails.



Figure 2: Military bunker of the P Line in the Pyrenees. Otxondo (Baztán – Navarre). Picture by Carlos Orduna Portús

At an etymological level, throughout History, the concept of boundary has changed any metaphorical or metonymical meaning (Mantecón, 2014, p. 19-32). Its own existence has always surpassed the periphery but it has always been held by a centrifugal force that tied it to a central and stable point. Therefore, it was the peripheral area the part that was farther from the terrestrial domain of a dominant nation or entity. It was the farthest point where that power could exercise its sovereignty. Thus, the idea of frontier –“what is in front”– was created (Bottino, 2009, p. 1). However, such idea of frontier exceeds the concept of limit, understood as a line in a plane. That is, when talking about border territories, we refer to a series of variables that make every frontier unique. They can be geographical, political or cultural. Moreover, all of them are ready to be more or less modified as they are humanized. In other words, they are functional since they adjust to those who establish or inhabit them (Zapata-Barrero, 2012). A clear example of that is the agreement reached between the Spanish and the Portuguese governments to exploit the waterfalls in the river Douro jointly (see figure #3).



Figure 3: Aldeadávila Dam in the Arribes del Duero (Spain– Portugal). Picture by Pablo Orduna Portús

While the limit divides the space into two, the frontier reaches a higher meta-physical stage. In other words, it is something ambiguous and complex that brings together the symbolic aspect and, thus, the ability to bring closer or to separate. In that way, the idea of frontier reaches the human fact in its full complexity, and exceeds any linear or simplistic conception of it. Therefore, when doing research, anthropologists and historians must take into account the subjective frontier, the subtle border that cannot be apparently recognized. It is true that, at a political level, we should start from an idea based on power and the territorial sovereignty principle. Nevertheless, connected to that, there is another idea of demarcation as a cultural principle that is surrounded by the exclusion and inclusion of the other. At the same time, it is subject to the idea of security or vulnerability of the power that establishes the legal boundary of the space. Inevitably, together with that, the reality of inequality arises as a response to the lack of its antonym (Zapata-Barrero, 2012, p. 52).

Are we facing an assimilation or cultural pluralism?

Heewon Chang (1999) explains that the social and population structure of peripheral communities is formed as a response to the conjunction of different multicultural categories. Those aspects are defined through a complex assimilation and adaptation process within a particular identity. It is in that point when the concept of “cultural boundary” appears. There, we can find a melting pot of different people (Garreta i Bochaca, 2003, pages 70 ff.) Or else, it can give rise to a plural society where every group upholds its own particularities in a common construct (Garreta i Bochaca, 2003, p. 27, 39 and 53).

As Consuegra (2011) points out, boundaries are settling rather than differing places. Even if it gives rise to the separation between two different realities, it will always yield to the habitation. Therefore, in an “empty area” a place to colonize will be sought; if it is a “barbarian place” it will become civilized and if it is an inhabited area but “peripheral” it will develop its own identity. A noteworthy example of a central power in a borderland inhabited by Vascons that wanted to control the land was the Roman trophy-tower in Urkulu (Orbaizeta – Navarre). It was built by the Romans to commemorate their victory in Aquitaine. It was designed as an exaltation of the victory and as a boundary stone on the south of the newly conquered territories (see figure #4).



Figure 4: Roman trophy-tower of the 1st century B. C. E. in Urkulu Mountain (Pyrenees of Navarre)
Picture by M^a Victoria Portús Pérez

Richard Harstshorne (quoted by Bottino, 2009, p. 3), emphasizes that central powers facing such outlook or mosaic of interrelated realities react with two different and opposed forces. Thus, there is one centrifugal force that sets its last length limits, and one centripetal that represents self-identity within its own territory. However, in that way, according to Bottino (2009, p. 3), the limit, the boundary, becomes a legal entity preserved by the Government. People are no longer needed to preserve it. In other words, it turns into an abstraction of the national law; into a reality subject to international laws, which usually are far from the wishes of the inhabitants of borderlands (Bottino, 2009, p. 3).

Now, in the eyes of an anthropologist, it is necessary to include more than just official relationships in the concept of border. That is when what you might call “border culture” arises, a game of undetermined human and historical facts. It is, then, no longer a programmed area, but a multiple interpretation of the same territory. Hagget (quoted by Bottino, 2009, p. 3-4) talks about the subsequent borders. They are drawn as a result of the development of the establishment of populations in their margins. Next to them, precedent borders can be seen, which were established at an international level by political and diplomatic treaties. There is a third group, according to Hagget, consisting of the borders superimposed over the population that previously inhabited the territory. See the boundaries established by the colonizing powers over the native ethnic groups in occupied territories.

We are, then, facing an ambiguous reality full of nuances. In our peninsular scenario, we can refer to the smuggling border or to traditional agreements, such as those of common areas (*partzuergoak, comunais...*), between adjoining valleys in both sides of national boundaries (Melón, 2010). One of the most representative examples of such cross-border event might be the Tribute of the Three Cows. It is an agreement between villages of the Roncal Valley (Navarre – Spain) and the Baretous Valley (Bearn – France). That consortium or agreement has not changed despite the various conflicts that have closed the border between Spain and France throughout History (see figure #5).

Between an unreal boundary and a symbolic limit

If we go beyond the simple cartographic fact, the border reality becomes a polysemic speech regarding human and cultural meanings. Therefore, in order to understand its wholeness, we need to develop a cognitive process. Such analysis must be cross- and interdisciplinary. With regard to the demarcation of the limit, a series of relevant markers are established. There are internal markers (created by the powers who established the demarcation) and external markers (created by the communities that live in the territory). According to Chang (1999), such markers are easily recognizable.



Figure 5: Boundary stone called the “San Martín” Stone, where the Tribute of the Three Cows takes place; and decorative reminders in the towns on both sides of the border. Picture by Pablo Orduna Portús

All of them work together to set up a well-defined border culture. Moreover, it will be the very local community who, all together, will establish such culture from both sides of the line. The barrier cannot stop the contact between people in both sides and the transit of ideas and people. Actually, walls, customs are permeable nets. We face a cultural rhetoric that is embedded in the understanding of the environment, the ecological niche of the towns that accompany it. That is, we come across again with the already mentioned Haggett model of subsequent (ethnic, linguistic, legislative, etc.), precedent (post Westphalian) and superimposed (more or less accepted) borders.

Nevertheless, this ethnographic concept of border should not be understood as a living confrontation. It is about the ambiguity of border (Medina, 2006a & 2006b). It is a paradox the fact that an ethnologist doing field work in those territories would find a full cross-border coexistence and permeability. It is an infiltration like a mutual absorption between two groups, who base their interaction on their own perception in the equation of “us” against “them”. Such interaction and proximity can be noticed in several fields of study, such as toponymy, dialectology, population systems, family networks, migratory herding or movements (legal or illegal), that are structured parallel and transverse to customs or dividing barriers. Therefore, those will not only be the main topics that the ethnographer will research, but also the cornerstones of what the inhabitants of such places think about their human and social environments.

There is a saying in Vila de Barrancos, a city at the Spanish-Portuguese border, that says: *Cada terra com o seu uso, cada roca com o seu fuso* [Every land with its traditions, every wheel with its axle] (Mentioned by Navas, 1997). In this dilemma, we should focus the attention on the acculturation process suffered by those groups, the metonymic image of their border and their human understanding of the landscape where the border lies (Orozco, 2015). In other words, we move into the interpretation of the real phenomenology of the landscape.

That equation among culture and an occupied territory must be understood from an anthropological message. Especially, it is obvious in borderlands, where it is ‘entre deux’ (Ligrone, 2010). It is true that a cultural border is also a political space where ethnic groups actively blend and merge their culture with that of the dominant. Thus, the interrelationship of humans with their ecological niche can be observed and analyzed from the Anthropology of the Territory (García, 1976).

According to Aguirre (1997, p. 13), from the point of view of human ethology, it is said that humans have always had a tendency to occupy, demarcate and defend a territory, taking into account costs and benefits. However, from a cognitive and symbolic perspective of the etnoterritory, “human territoriality is defined as a habitat that a community acquires and culturally adapts” (see figure #6).



Figure 6: Herd of sheep grazing in Latxotola forest (Uztarroz – Larraine) on both sides of the Pyrenean international border. Picture by Pablo Orduna Portús

Thus, as stated by Chang (1999), the border can be understood as a psychological space where bi- and multicultural identities strive one with another. Therefore, it is necessary to characterize the cultural identity terms that prioritize the process of ethological adjustment of the inhabitants to the environment. That is the only way to understand the socio-cultural impact of a boundary within a community. In other words, in order to open up a phenomenological interpretation of the border landscape, the human and cultural space must be interpreted. We must approach their cultural group and “fingerprints” (material, formal, and non-material fingerprints) that have been left behind in their population environment (Albert, 2006). Nonetheless, we should remember that such spaces are permeable boundaries, areas opened to culture, history and population transit.

As Romero (1998) says, in peripheral and border territories a series of economic, linguistic, social and cultural relationships persist much more clearly than in other places. They are facts that can only be evaluated from an ethological perspective (at human level). Such point of view cannot drop out the cognitive and symbolic prism that every multicultural society needs for its global understanding. Besides, we must be aware of the adjustment process that occurs in them. As stated by García (1976, p. 1), in that process, the territory functions as an important ground for cultural behavior. Inhabitants should never attach themselves to that place directly, but completely understanding and assimilating the territory as an inseparable part of their own identity.

According to Escamilla (1999b), in any borderland, as well as in other places, we can see that “spatial patterns are the geographical structures that can be identified in space in a certain moment”. Now, every evolution process within them forms a set of “changes or alterations of those patterns over time”. Therefore, as the author states, such patterns “are the equivalent to an image of the geographical structure of an area in a certain moment. That is, we could consider them “photographs” or transects in time”. However, the already mentioned transformation phases they suffer “would be equivalent to a movie, which would show the essential changes to reach a good geographical interpretation and explanation of our world”. But, is it only a physical and geological evolution?

As Álvarez points out, the identification of the territory as a polysemic concept and phenomenological research category must fit within the reception theory and life history (Álvarez, 2008, p. 33-61 & 2010, p. 182-189). Thus, in order to understand the border territory, proxemics enables, at metaphysical level, the human perception of the space they live in (Hall, 1968, p. 68-71 & Navarro, 2011, p. 432 and 439). It is then when the relationship between human beings and the environment turns into a cultural construction, besides the already mentioned “ecological niche”. The inhabitant considers the landscape, his space, a symbolic and social structure. He transforms and develops it in his mind until it becomes a personal or group experience. As stated by Álvarez (2008), it becomes, besides a natural fact, a human fact that suits Baudel’s *longe durée*.

As has already been stated, we could say that the border limit is part of a complex narrative that shapes collective memory (Mairal, 1994). Then, we must read that ideological landscape of a border community as an active part of their “places of memory”. And, as we have said, the essence of such particular spirit must be found within the equity stemmed from ambiguity. Its cultural sense must be found within the polysemic speech of the concept of boundary – spatial or material – and in the symbolic perception that it transmits (Perales, 2004).

One of the hints given by the historical evolution of those human groups lies inside the cultural heritage background –tangible and intangible– that they have created themselves and have implemented in their environment. Such heritage treasure must be valued as a development source for those peripheral territories. Therefore, it must be scientifically researched and studied through analysis or cataloguing systems. That is the only way to understand and apprehend heritage elements as key elements in their history and in the formation of their projections into the future. To that end, we must not only give sense to their particular border identity, but also achieve a change in the traditional conception of those places that nowadays consider such facts signs of delay or an obstacle for their local administration.



Figure 7: Aerial view of the Real Fuerte de la Concepción located between Aldea del Obispo (Salamanca) and Vale da Mula (Concehlo de Almeida – Distrito da Guarda). Image source: Google maps based on BCN IGN España

On the contrary, a good example of local heritage development is the refurbishing of the Real Fuerte de la Concepción in Aldea del Obispo (Salamanca). The citadel that dates back to the 17th and 18th centuries was built few meters away from the meadow of the Turones River. The riverbed functions as boundary between Portugal and Spain. The building lost its strategic value for defensive and border purposes after being blown up at the beginning of the 19th century by British troops. It was forgotten for long time, but nowadays it has been refurbished and transformed into a hotel and a restaurant (see figure #7).

Final assessments

Gurevich (quoted by Bottino, 2009, p. 5) states that world configuration nowadays results from the union of different fragments. That way, its wholeness creates a mosaic that is not only a simple addition of parts, but also the reflection of a latent dynamic. It is evolution joining and separating pieces constantly. It reorders its structure according to every historical and cultural moment. Bottino (2009, pages 5 ff.) specifies that, maybe from the outside of its context, each of those tiles can be gathered into a series of territorial “archipelagos” with a widespread union. Maybe, sometimes, those common nexus -tangible and intangible- are not noticeable for the researcher and such sections of mixture appear distant or isolated pieces.

It is in that moment when the reality of the border exceeds the line drawn by the nations on the map. Barriers become a simple curiosity in the landscape and cross-border networks stay alive and active. In such coexistence, separation becomes a union force for the community and it is not necessarily based on –state or thought– reasoning. The group who lives next to the “line” assimilates it as its own, as part of its own identity. The group keeps in the line its heritage, group memory and current vitality. It transforms the territory around and puts queries to the researcher: What can we currently understand by real border? What are border territories, peripheral

territories or hinterlands that have no contact with other realities? Are they places of conflict or places of common understanding and construction for their inhabitants? In any case, one thing is objectively certain... borders are the most fertile greenhouse regarding progress and evolution in human reality.

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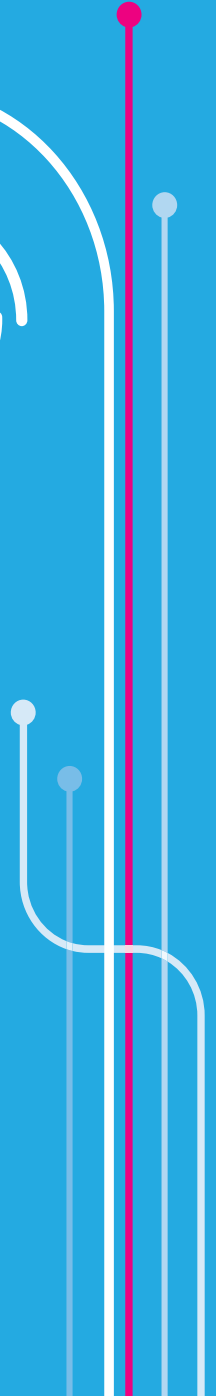
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Information Technology and Forensics



Increasing Students' Interests in Computer Vision Lectures by Using Forensic Examples and Proper Teaching Methodologies

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Abstract

It is relatively easy to teach Image Processing. It seems to be clear what should be included in the lectures, and it is not difficult to come up with basic practical exercises. However, students often have great expectations and finally find Image Processing workshops boring. In this paper a new conception of teaching Image Processing is proposed (lectures as well as workshops). This approach has been tested in small groups of students and seems to be successful – after the course students become strongly interested and involved in the field of Image Processing. This paper also describes specificity of Computer Vision in Forensics – from basic techniques to state-of-the-art algorithms – so that using this teaching approach would be useful for teachers with no Forensic background.

Keywords: *Image Processing, Computer Vision, Computer Forensics, Teaching, Inquiry-based Learning*

Introduction

Teaching the Image Processing course is often considered to be easy. Lectures should include pixel representation, raster images, pixel-level operations, frequency-domain filters and further topics. Workshops should give an opportunity for students to implement their own Image Processing applications. In reality, this course turns out to be challenging for the tutor as well as for students. Students often have great expectation when picking Image Processing course, while the very first lectures are often found too theoretical, boring and distant from programmer's reality. Even worse, first workshops are not thrilling too – students (of varied programming knowledge/skills) have to design and implement a core application (for future implementation of filters, modifiers, etc.), which is not a hands-on Image Processing workshop kick-start they have expected. Of course, the teacher/TA may offer a basic “revision zero” application, so that the students would not have to implement it, and would be able to focus on Image Processing, but this approach seems to be even worse – students still have to spend time “learning” the core application's code, and they are tend to be less proud of their skills, than if they had developed the whole application by themselves.

Considerations concerning the teaching methodology have led the author to the root of the learning and cognition – first sparks of fascination/interest, which are of great importance for the students' attitude towards the topic, knowledge and competences/skills to be taught. Tutors should be aware that their experience and practice might turn into routine – in that case one of the first symptoms would be the lack of students fascinated by the topic.

Methodology

During the search for an inspiring, active – while activating – teaching methodology, the author was asked to organize a new course of study – Computer Forensics (CF). The CF course included a subject called Computer Vision in Forensics (CVF), which deals with image enhancement (e.g. to recognize a criminal), detection of counterfeits (photos as well as documents) and more. The CVF workshops require basic programming experience, the awareness of digital evidence – and – basic Image Processing knowledge.

At a first glance, a subject, which requires knowledge of Image Processing, seems to be useless for teaching Image Processing. But there is something incredible about the CVF workshops – students were fascinated and truly involved in participating in the workshops. This might result from the opportunity to play the role of an investigator, to solve some kind of puzzle or mystery in every task.

After the methodological success of the CVF workshops, a new idea has emerged – to use the ambiance of the Forensics (puzzles, mysteries, crime stories, digital evidence, image refinement/manipulation) in Image Processing workshops.

An experimental run of the first CVF-inspired Image Processing class at Opole University of Technology was performed in academic year 2014/2015.

Lectures

The Image Processing lectures were entirely revised. All basic and introductory content was removed and replaced by case-specific slides, presenting a particular modification (Figure 1a) or a problem to solve (Figure 1b). This, of course, required much more effort from the tutor, while the presentation was not supportive – the tutor had to use a specific slide as a ground/provocation for introducing the Image Processing knowledge.

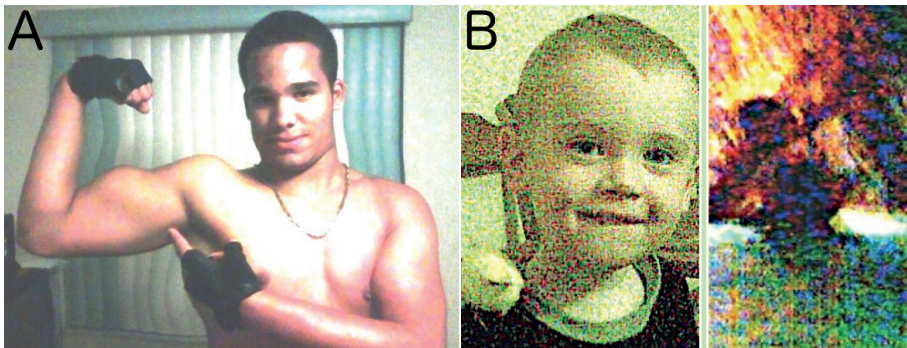


Figure 1: A) – an entertaining example of a specific modification (geometric) [source: PSDtube.pl], B) – an example of one of the Image Processing challenges (CMOS matrix noise) [own work]

This approach at first seemed to lower the quality (substantive level) of the lecture, but in conjunction with workshops it turned out that students become significantly more interested in the matter and finally their knowledge is greater than when using the usual/previous lecture and workshop contents and methods.

The first lecture introduces the contents, methodology and an entertaining introduction to image manipulation. The following ones include CVF-flavored “cases” (e.g. Figure 2 and 3), which can be solved using Image Processing software/procedures. The tutor explains the proper Image Processing procedures and their background.

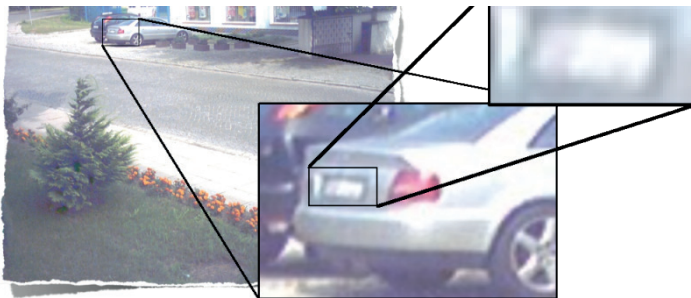


Figure 2: The reality of the popular “let’s zoom in” movie phrase [own work]



Figure 3: An example of successful image enhancement using only basic modifications [own work; original source image: internet/unknown]

The first lectures are supposed to inspire and induce to participate every student actively in the course. The content of following lectures, showing and explaining more advanced issues and aspects of image Processing can be organized in any possible way, however the lectures will not lose high reputation if the forensic-flavored style is continued. Figure 4 presents the informal agenda of lecture 3, entitled “software for analysis of digital photographic evidence”, which slides are also a pretext to introduce first advanced Image Processing algorithms.

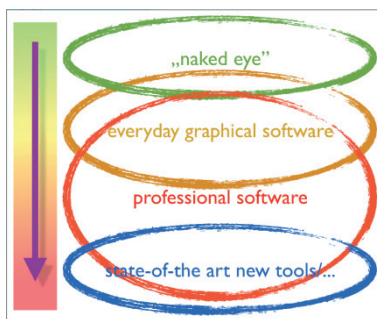


Figure 4: An informal agenda of the 3rd lecture (introduction to advanced algorithms) [own work]



Figure 5: Example slides, explaining the most important algorithm for analysis of authenticity of

digital images – the ELA algorithm [fotoforensics.com]

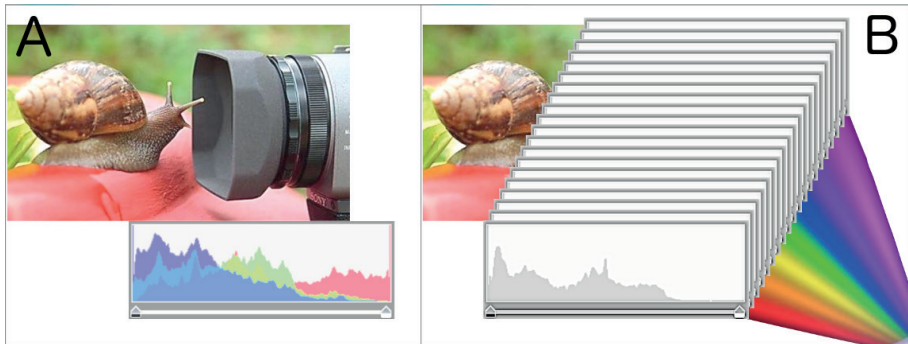


Figure 6: Example slides, explaining the most important tool for digital analysis of authenticity of documents – hyperspectral imaging [own work]. A – RGB image, B – hyperspectral image



Figure 7: Example slide, presenting one of the state-of-art algorithms for automatic detection and visualization of image manipulations [Kee, Farid]

Error Level Analysis algorithm (Figure 5), while showing modifications done to a digital image, can be used as an occasion to describe JPEG compression, cosine transform and its typical artifacts. Hyperspectral imaging (Figure 6) is not only a great tool for distinguishing different combinations of pigments in counterfeit documents, but also a nice opportunity to describe physics and optics of the acquisition process of an image to its digital form. Lectures can also include some of the state-of-the-art algorithms (Figure 7), to show the boundaries of what is known or what is currently considered to be possible. Students (especially the most ambitious ones in a group) actively participate, if they have the feeling that the latest and up-to-date knowledge, tools and research are presented in a lecture.

Lectures, arranged as a journey into the world of Computer Vision in Forensics, can go surprisingly deep into the Forensic reality. If presented with passion, students

can get readily involved. Of course, the workshops content should not exceed students' programming capabilities, so the contents of lectures and workshops might split at a specific moment.

Workshops

The Image Processing Workshops were also redesigned to fit the new convention. During the first workshop students are given a half-ready project of an application, capable of opening an image from a file and showing it on a graphical user interface. The application contains only few lines of code and an extremely simple interface, so designing it from scratch can also become a part of the workshop scenario, but it might overshadow the first impression of CVF, and make the workshops look similar to any other programming workshops. First programming tasks are correspondent to the basic image representation knowledge and the simplest pixel-wise operations, e.g. brightness correction. Subsequent workshops include increasingly complex image manipulation algorithms: histogram-based image corrections, noise filtering, finding edges, frequency-based filtering, Error Level Analysis.



Figure 8: An example “evidence” digital image, in which brightness correction is not sufficient to read the car’s plates – students should/will implement high-pass filtering (4th workshop) [source image: driversedguru.com]

The workshops would be particularly engaging if the students have the opportunity to work with a broad collection of meaningful and representative examples – images that are consistent with the forensic convention of the course, images that actually are (or might be) a real digital evidence in a case (e.g. Figure 3 and Figure 8).

Summary

This paper describes a new conception of teaching Image Processing. The key aspect of the proposed approach is to use Computer Forensics as a base for all considerations (lectures, workshops and learning approach). This should be done by using Student-Centered Approach to Learning [Gibbs]. Student-Centered

Approach includes Inquire-Based Learning methods and Cooperative Learning Methods [Teach.com], and three main teaching models can be found within the Inquiry-Based Learning [Grasha]: Facilitator, Personal Model, and Delegator. The Facilitator model [Carey] is an open class model, in which the teacher and students work together. The model emphasizes hands-on learning, exploration, and fostering independence [Grasha]. Hands-on learning and independent work, understood (by the teacher) as a form of natural learning, results in engaging students in active [Armstrong] and highly effective learning process. Highly engaged students have better understanding of the issue and they represent higher level of practical skills and knowledge. Hands-on learning, and generally all Inquiry-based learning methods, enable the possibility to run and maintain the didactic process on highest levels of Niemierko's cognitive/knowledge taxonomy [Genci2010, Genci2013] – C and D, where: A = remembering, B = understanding, C = application of knowledge/skill to/in a standard situation, D = application in an extraordinary situation [Szlosek].

Ensuring a decent quality of learning/teaching process can be achieved by using any student-centered learning approach. Great advances in the quality of didactic process can be attained if students become truly interested and involved into a topic. The “forensic atmosphere” of lectures and workshops is intended to gain students' attention, to activate and engage them, to give them an exciting and interesting wrapping for the knowledge and skills they are supposed to gain during the course.

An anonymous evaluation poll was prepared and performed among the “CVF-flavored” Image Processing classes and the “classical” ones, but the results were comparably similar. In both cases students answered similarly, resulting in respectively 4,6 and 4,4 (scale: 1..5) overall student's average satisfaction. However, student's response was absolutely different when it comes to the engagement and competences: 7 students came to ask about the possibility to write their diploma theses (7 out of ca.60, formerly: 1 of ca.60), ca. 1 student per week comes to talk/ask about an issue during author's office hours (1 out of ca.60 , formerly: ca.1 per month).

In conclusion, Computer Forensic applied using Inquiry-based learning methods to the learning/teaching of Image Processing gives better results (or requires less effort) when it comes to the quality of learning and the level (taxonomy) of knowledge.

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Language and Culture



Is Mirandese a poor second? – Portuguese linguistic heritage Será l mirandés l pariente probezainas? – Fazienda de la lhéngua en Pertual

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Abstract

Portugal has proudly presented herself to the world as the oldest monolingual country in Europe, where only one language had been spoken since immemorial times. This assertion consisted of an important means of national identity (Ferreira, 2002, p. 65), enhanced by the Portuguese dictatorship in the 20th century, which comes to explain international amazement when the acknowledgement of Mirandese as the second official language took place with the law no. 7/99, just at the very end of the first millennium. In fact, the language that takes its name from the region where it is spoken – Miranda do Douro –, dates back to the 6th century, even before the birth of Portuguese nationality, and stems directly from Latin via Asturian-Leonese branch of languages, bearing resemblances with the currently surviving languages, as well as with Portuguese, until it was finally “discovered” by José Leite de Vasconcellos in 1882. Mirandese has been given a new lease of life by means of the translation into Mirandese of canonical and liturgical literature, the production of prose, poetry and theatre in Mirandese, as well as the compilation of traditional oral literature. It is then our aim to provide a thorough historical perspective of Mirandese and elicit its identity, along with

an overview of Mirandese literature (translated or not) and a reflection on the importance of the law no. 7/99 for the assertion of the language.

Keywords: *minority languages; language policy; Mirandese; law no. 7/99; spelling convention.*

Introduction

Daqueilho que to la giente gusta ye de falar de si mesmo ou d' ancuntrar-se a si mesmo an la fala de ls outros. Por isso, bou a cuntar-bos un cachico de la mie bida para berdes se an eilha ancuntraís algo que seia tamien buosso. I tamien para que sábades por que razones you, que nun naci an terras mirandesas nin falo mirandés, m' antresso por esta lhéngua i stou hoije eiqui a falar-bos subre eilha. (Barros Ferreira, 2003, online)

The topic of Portuguese culture and language, which has been the motto of my participation in the IPB's Erasmus Week, intends to broaden participants' knowledge of the country, enabling them to have a taste of Portugal without having to leave Bragança. Among the various aspects focused on, I highlight one which I personally envisage of considerable importance: language or rather languages. For centuries, Portugal asserted herself as the oldest monolingual country in Europe, disregarding not only regional varieties, but also the minority language spoken in Miranda do Douro and surrounding areas. This fact was only altered at the end of the 19th century, when Leite de Vasconcellos "discovered" the language and wrote seminal work on Mirandese. It was in his "Mirandese Philology" that Leite de Vasconcellos established not only all necessary conventions for this language to become a written language, with an alphabet, phonological, morphological and lexical rules, but also gathered traditional oral literature. Despite his philological efforts, Leite de Vasconcellos foresaw the death of Mirandese and the construction of Douro's dams and the arrival of "outsiders", along with the intense migration movements of the 1960s, seemed to support this gloomy prediction.

According to the European Charter for Regional and Minority Languages (ETS 148, 1992), a regional or minority language is a language "traditionally used within a given territory of a State by nationals of that State who form a group numerically smaller than the rest of the State's population and [thus] different from the official language(s) of that State". In this charter, it is recognised the need to protect "the historical regional or minority languages of Europe, some of which are in danger of eventual extinction, [which] contributes to the maintenance and development of Europe's cultural wealth and traditions", because "to use a regional or minority language in private and public life is an inalienable right" of every European citizen.

According to the *Centro de Linguística da Universidade de Lisboa* (CLUL), Mirandese is the minority language spoken in northern Portugal, on a 500-km²

plateau in the vicinity of the Spanish border that follows the winding route of the River Douro. Historically, it stems from Asturo-Leonese branch of languages, with which it shares a number of phonetic features, resulting from a lengthy period of common evolution. Having survived to the 20th century as an oral language, the Portuguese Parliament only acknowledged Mirandese as an official language in Portugal in 1999, along with the publication of its “Spelling Convention”, whose first version appeared in 1995.

As put forth in previous work (cf. Martins, 2014), the 20th century witnessed serious development in linguistic geography, specifically carrying out linguistic atlases which allowed for the mapping of national and regional varieties in Europe based on phonetic, morphological and lexical features.

Barros Ferreira & Martins (1987, pp. 33-34) state that linguistic atlases enable to show the differences and resemblances between languages and dialects, whereas linguistic monographies allow the thorough study of a particular language or variety. Therefore, a linguistic atlas consists of a series of maps of a region, which facilitate the comparison of what happens linguistically speaking in one area to others. These authors mention different atlases, such as the *Atlas Linguarum Europae* (ALE) and the “Atlas Lingüístico da Península Ibérica” (ALPI – *Linguistic Atlas of the Iberian Peninsula*), the latter made up of 75 maps with a focus on historical phonetics.

On the other hand, in the words of Przemysław Dębowiak (2008), there can be identified three different stages in the history of Portuguese linguistic geography, namely due to the work of Leite de Vasconcellos, Paiva Boléo and Lindley Cintra. The first and foremost work was conducted by Leite de Vasconcellos, who presented, in 1893, the first classification of Portuguese dialects on the basis of the aforementioned characteristics. Then Paiva Boléo followed with his *Linguistic Survey* in 1942, in line with other European surveys, and managed to confirm Leite de Vasconcellos’s data. One of the innovating aspects was that Paiva Boléo focused on the identification and limitation of the several isoglosses (i.e. isophones and lexical isoglosses) in Portugal, allowing for further work to build on. The third stage of Portuguese linguistic geography is led by Lindley Cintra with his *Linguistic Atlas of the Iberian Peninsula*, following work from 1962 on the lexical areas of the Portuguese territory. It was in 1971 that he came up with “Nova Proposta de Classificação dos Dialectos Galelo-Portugueses” (*New Proposal for the Classification of Galician-Portuguese Dialects*). Based on phonetic features, Lindley Cintra presented a classification which is still the most widely accepted: the north, coastal areas and northwest are viewed as the most conservative, whereas the south, the inland and the centre and south are regarded as the innovating. By going beyond political and administrative borders, Lindley Cintra classified the dialects into Galician dialects, Portuguese northern dialects (encompassing *transmontanos*, *alto-minhotos* and *baixo-minhotos*, *durienses* and *beirões*) and Portuguese centre-southern dialects (i.e. centre-coastal, centre-inland and south). As a result, Przemysław Dębowiak

(2008) defines the north dialects as more conservative, by including, for example, ancient features no longer identified in other regions. These dialects, as a whole, developed in a more stable region, less prone to foreign invasions or human migrations, with the exception of those occurring in the 1950s and 1960s, at the height of the Portuguese dictatorship.

Bearing all this in mind, this paper will be organised into three parts, all of which are intertwined as pieces of a far more complex jigsaw puzzle. The first part will focus on the historical background of Mirandese language from the period in which it was a “mere” oral language to its “discovery” by Leite de Vasconcellos, who provided it with philological and literary documentation. Added to this, attention will be devoted to the geographical areas where Mirandese is spoken and varieties that arise there, as well as to some of their phonetic and lexical features, attempting to elicit its linguistic identity. Secondly, as a result of this gradual assertion of Mirandese from the end of the 19th century to the last quarter of the 20th century, we shall briefly present a number of the works originally written in Mirandese or translated into Mirandese either from Portuguese or from other foreign languages. At last, we intend to offer a thorough explanation concerning the importance of 1999 as the date when Mirandese was finally acknowledged as an official language in Portugal, but also received full recognition by means of its “Spelling Convention” and other critical work.

Brief history of Mirandese and its linguistic identity

José Leite de Vasconcellos is a landmark in the “discovery” of Mirandese, the language that dates back to circa the 6th century AD, even before the foundation of Portuguese nationality, which is commonly accepted as being 1143 (Quarteu & Frías Conde, 2002, p. 89). He was a renowned Portuguese linguist, philologist and ethnographer, whose doctorate thesis focused on Mirandese – “Esquisse d’une dialectologie portugaise” – and was published in 1901. His interest for the language arose when he came across a Medicine student in Porto, in 1882, who was originally from Miranda do Douro. His first contact with this “língua charra” (rude language) led him to visit the region in 1884 to study it and this encounter ultimately resulted in his 830-page-long Mirandese philology, organised into two volumes.

According to Przemysław Dębowski (2008), Leite de Vasconcellos’s thesis:

foi a primeira obra de síntese mais pormenorizada, decrevendo e classificando as variedades diatópicas do português e que, apesar de imperfeita e já um pouco antiquada, sempre constitui um ponto de partida obrigatório para quem estiver interessado nos falares de Portugal. Convém mencionar que até hoje não a veio substituir nenhum outro trabalho comparável que apresentasse uma extensa imagem actualizada dos dialectos portugueses.

Mourinho (1987, p. 75) sets off Mirandese as a neo-Latin language that encompasses the council of Miranda do Douro, as well as three locations in the council of Vimioso, although it might have been spoken by some populations in the council of Mogadouro, namely Urrós and Bemposta. According to Raposo (1987, p. 55), Mirandese is spoken by 15,000 people in Miranda do Douro villages (except Atenor and Miranda itself) and in three parishes in Vimioso (i.e. Vilar Seco, Anueiro and Caçarelhos) and has cast its influence in Vimioso, Mogadouro and Bragança. It was described by Leite Vasconcellos (cit. Mourinho, 1993) as a rustic language used along the traditional activities of agriculture and breeding cattle – it is the “*língua do campo, do lar e do amor*” (language of the fields, home and love). From Martins’s point of view (2002, p. 56), this statement may also have had a negative effect on Mirandese, because by recognising the importance of the family in the language transmission it might have condemned it to not having the ability to convey more elevated, abstract and scientific thoughts or concepts, as it often happens with minority languages.

As mentioned above, Leite de Vasconcellos published two volumes on Mirandese language between 1900 and 1901 – “*Estudos de Philologia Mirandesa*” (“*Studies in Mirandese Philology*”) –, the first being about the structure of the language and the second with Mirandese documentation and other texts, such as literary ones (cf. Annex). Later, he also gave to light work on his “*Opúsculos*” (*Opuscules*).

In the second volume of his studies, Leite de Vasconcellos (1901, pp. 4-6) claims that the origin of Mirandese is Latin, which he managed to prove by means of a complete correspondence between Latin and Mirandese phenomena, which affected and influenced the language in terms of, for instance, the formation of the plural and feminine of nouns, pronouns, numerals, verbs, prepositions, conjunctions and adverbs. He goes as far as to state that Latin and Mirandese are two different stages of the same language. Nonetheless, it is obvious that Mirandese is one of the languages that makes up the linguistic system of the Iberian Peninsula, resulting from a direct stage of Latin modified in loco by the people that inhabited that place.

Despite some authors’ hypotheses, the Land of Miranda was not deserted at the time of the Romans and if there was an ancient population there must also have been an ancient language as well, which is documented by numerous archaeological vestiges, such as tombs, inscriptions and the like. However, Leite de Vasconcellos (1901, pp. 7-9) argues that there are no barbarian remainders in this region, although some Germanic and Arab words have survived to these days – e.g. *Sendim* and *Atenor*, respectively. Both words might be borrowings, since Zamora was under the Goths and Arabs’ rule.

Another aspect Leite de Vasconcellos (1901, p. 10) raises is the fact that Mirandese was not the only language spoken at this region – there were also *Riodonorês* and *Guadramilês* –, a fact that also comes to show that the region of Miranda was much larger than what it is nowadays. Notwithstanding, he highlights the fact of how

extraordinary it is for Trás-os-Montes to offer three linguistic systems that are so unique in themselves.

Mirandese finds itself caught between Leonese territory, on one side, and the River Douro, on the other, thus enjoying the perfect conditions to develop “uma falla especial” (Leite de Vasconcellos, 1901, p. 11) or special way of speaking. It was for centuries determined by its relative isolation¹, having established contact with the rest of Portugal by means of roads, newspapers and primary schools. We should bear in mind that the railway to Miranda was only concluded in 1938, when it finally arrived at Duas Igrejas. The full railway line was 105-km long, connecting the station of Pocinho to Miranda do Douro, past Torre de Moncorvo and Mogadouro. The complete journey took three and a half hours and, in 1975, there were 4 operational connections in both directions. However, it was reduced to only 2 by 1980. In 1986, it ceased to transport passengers and, in 1989, it was definitely closed down².

Another peculiarity we must not overlook is the effect of the construction of the dams in Miranda (cf. Sérgio Ferreira, 2011 and 2012) and the opening of this community to national “outsiders”, which, according to Moreira (1962, p. 15), were looked upon in suspicion and displeasure, because of speaking the national language. Mirandese people would call these outsiders impostors: “Chamam “impostor” no sentido de pretensioso e vaidoso a quem tal fizer. Falar português é falar “fidalgo” índice de preciosismo pouco grato ao mirandês” (Moreira, 1962, p. 15).

In this context of confinement, in the words of Leite de Vasconcellos (1901, pp. 11-15), Spanish phonetics does not particularly influence Mirandese, nor its morphology, but rather its lexicon. The same occurred with Portuguese, whose influence was more powerful on Mirandese lexical elements, even if the relation between Mirandese and Portuguese was stronger and more intimate.

As far as documentation is concerned, Mirandese offers few examples of archaic documents, besides the odd inscription or tomb, as mentioned above. Leite de Vasconcellos (1901, pp. 16-25) refers to some documents from the 16th and the 18th centuries, related to the demarcation of places and parish memories, from where he retrieved Mirandese words.

In this second volume, Leite de Vasconcellos (1901, pp. 28-29) presents Mirandese as a set of popular and indigenous ways of speaking that encompass three different sub-dialects or dialectal varieties: border or northern Mirandese (from the so-called dry border); *Sendinês* or southern Mirandese; and normal or central Mirandese. The first is defined by a number of morphological differences, whereas the second is distinguished by significant phonetic features; however, lexical differences may be identified on the whole territory. Leite de Vasconcellos (1901) also suggests the existence of a 4th variety that would include Mirandese varieties in Vimioso, calling it western Mirandese, although he acknowledges the lack of elements to support this statement.

Elaborating on Leite de Vasconcellos's data, Barros Ferreira & Martins (1987, pp. 33-37) sustain that the aforesaid linguistic atlas – ALPI – facilitates the comparison of Mirandese to Portuguese and Galician, in line with what Menéndez Pidal (1906) upheld earlier in the 20th century, but also to other Leonese varieties and Castellano, as it is shown in the following three tables. These tables summarise data about the phonetic features of these varieties.

| Latim | Mirandés, português, galego, leonés | Castelhano |
|---------------|--|--|
| F- | f- | ϕ (+ leon. ori.) |
| [ks] | [s] | [x] |
| -C'L-, -LL- | [λ] | [x] |
| -CT- | -it- | [tʃ] (+ leon. ori., sul) |
| [ow], [ej] | [ow], [ej] | [o], [e] (+ port. sul e leon. ori.) |
| -SC + i, e | [s] | [θ] (+ leon. ori., sul) |
| CL-, FL-, PL- | [tʃ] | [λ] (+ leon. ori.) |

Table 1: Comparison of Latin to Mirandese/Portuguese/Galician/Leonese, on the one hand, and Castellano, on the other (Barros Ferreira & Martins, 1987, p. 34)

There is also a series of phonetic features that connect Mirandese to Portuguese, Galician and Leonese dialects of the north of Spain that Castellano does not exhibit.

| Latim | Mirandés e dial. leon. | Gal. e port. |
|------------------------|------------------------|--------------|
| -L-, -N- | -l-, -n- | 0 |
| -LL- -NN- | [λ] [ñ] | -l-, -n- |
| [ε] < $\overset{u}{E}$ | [jé] | [ε] |
| L- | [λ] | l- |

Table 2: Comparison of Latin to Mirandese/Leonese varieties, on the one hand, and Portuguese/Galician, on the other (Barros Ferreira & Martins, 1987, p. 36)

Similarly, some phonetic phenomena distinguish Mirandese and Leonese varieties from Portuguese and Galician. Finally, within the Leonese territory, Mirandese has its own identity and presents a greater phonetic resemblance to the dialects of the north of Portugal.

| Latim | Mirandés e port. N. | Outros dial. leoneses |
|-------------------------|---------------------|-----------------------|
| ŏ >[ɔ] | [ɔ] | [we] |
| ō >[o] | [wo], [wɔ] | [o] |
| S-, -SS- -S- | [s] [z] | [s] |
| KE-, KI-; -KI-, -TI- | [s] ou [z] | [θ] |

Table 3: Comparison of Latin to Mirandese/Portuguese, on the one hand, and Leonese varieties as a whole, on the other (Barros Ferreira & Martins, 1987, p. 37)

As far as morphology is concerned, Barros Ferreira & Martins (1987, pp. 39-40) mention archaic words and expressions that can still be identified in Mirandese. For instance, *bubela* or *boubielha* (PT “poupa” > one of the birds from the family Upupidae) is an archaism that is only known through Medieval Galician-Portuguese literature. Mirandese words *antenado* (PT “enteado” > stepson) and *pulburino* (PT “redemoinho” > whirlwind) are examples that bear such a long-lost form that they enable to shed light on the current meaning of the words in Portuguese. A final instance consists of “joaninha” (> ladybird) which, in Trás-os-Montes, assumes the form of *pata-sol* or *pata-sola* (> paw-sun or paw-sole), whereas, in Mirandese, it is *cunta-dedos* or *cunta-me-los dedos*, forms that are also similar in Almeida and Sabugal in the district of Guarda, according to these authors. This is coherent with what occurs in Leonese territory, where it is recommended that the lady bird should “contar os dedos e voar para Deus” (count fingers and fly to God) (Bouza Brey, 1948, 1950 cit. Barros Ferreira & Martins, 1987, pp. 39-40).

All in all, Mirandese is defined by Mourinho (1987, p. 80) as bearing the perfect and complete linguistic structure, directly stemming from popular Latin in the 12th century, thus possessing a richer and more complicated phonology than that of Portuguese and Spanish. This author claims that this is reflected on the evolution and conservation of intermediate vowel sounds, of its indefinite diphthongisation and of its vowel and consonant dispersion into intermediate forms. Mirandese morphological independence is also shown in its pronouns, articles, some prepositions and verb inflection. Notice the following examples taken from the Mirandese Spelling Convention (1999, pp. 29-31):

- (1) the personal pronouns subject: *you, tu, el/eilha, nós, bós, eilhes/eilhas* (PT: *eu, tu, ele/ela, nós, vós, eles/elas*);
- (2) the definite articles: *l, ls, la or l', las* (PT: *o, a, os, as*);
- (3) the indefinite articles: *un, ãa, uns, ãas* (PT: *um, uma, uns, umas*);
- (4) the contractions of prepositions with articles: (4.1.) the definite articles and the preposition 'cun' – *cul/cun l, cula/cun la, culs/cun ls, culas/cun las* (PT: *com o, com a, com os, com as*), 'de' – *de l, de la, de ls, de las* (PT: *do, da, dos, das*) – and 'por' – *pul, pula, puls, pulas* (PT: *pelo, pela, pelos, pelas*); (4.2.) the indefinite articles and the preposition 'en' or 'an' – *nun, nũa, nuns, nũas* (PT: *num, numa, nuns, numas*);
- (5) verb to do/make: *fago, fais, fail/faç, fazemos, fazeis, fáien/fázen* (PT: *faço, fazes, faz, fazemos, fazeis, fazem*).

Along with the name of Leite de Vasconcellos, others should also be mentioned: D. Ramon Menendez Pidal, who established the Leonese affiliation of Mirandese; the philologist A. R. Gonçalves Viana that standardised Mirandese orthography; and the Swedish Erik Staaf, the latter publishing a volume on the ancient Leonese dialect in 1907.

Literary production and translation

Ã Abril
 Augas mil
 Coladas por um mandil
 (cit. Mourinho, 1987, p. 82)

It is possible to comprehend from the above-presented information that Mirandese was a spoken language only, without any written support, until the end of the 19th century, when it began being cultivated by various literate Mirandese people. Mourinho (1987, p. 77) illustrates this by mentioning names such as the Abbott Manuel Sardinha and Father Francisco Meirinhos, who translated short literary texts into Mirandese. Added to this, Bernardo Fernandes Monteiro, a civil servant at the Custom Services in Porto, conducted extensive translation work, i.e. St. Paul's Epistle to the Corinthians, the Four Gospels by Matthew the Apostle, Luke the Evangelist, Mark the Evangelist and John the Apostle, and a few short stories and dialogues in the monthly newspaper "O Mirandês".

Furthermore, Mourinho (1987, p. 77) mentions Trindade Coelho, due to the fact that he transcribed Leite de Vasconcellos's first writings in the Lisbon daily newspaper "O Repórter", which would be basis of his Studies of Mirandese Philology. Trindade Coelho published several texts and comments about Mirandese in this same newspaper, entitled "Echos", as well as excerpts of liturgical service texts from Bernardo Fernandes Monteiro's translation. Two final examples are Francisco Garrido Brandão, who composed an *entremés* (short, comic theatrical performance

of one act) in Mirandese, Portuguese and Galician entitled “Sturiano i Marcolfa” (two proper names), and Alfredo Cortez with his play “Saias” (*Skirts*) from 1938.

Notwithstanding, Mourinho (1987, p. 75) claims that there were written forms of this language scattered in ancient documents, such as letters, wills, donations, exchanges, lawsuits and contracts, from 12th to 19th centuries. A number of these documents were written down by scribes who were part of the Monastery Saint Mary of Morerueta, whereas others were the result of the intervention of less literate scribes who were Mirandese themselves and thus escaped the prescriptive rules of Portuguese (Mourinho, 1987, p. 75).

Returning to Mirandese literature in the 20th century, Mourinho himself also published texts in Mirandese: in 1941-42, he composed the legend “Siête hermanas” (*Seven sisters*), which was recited at the Society of Geography and published later in the Second *Transmontano* Congress, in which he also published “Nós somos de Pertual” (*We are from Portugal*). Between 1946 and 1947, Mourinho launched his “Subsídios para um tratado de dialectologia portuguesa” (*Subsidies for a treaty on Portuguese dialectology*), including sections on Mirandese dialect, the expansion and vitality of Mirandese and its literature, Mirandese grammar and phonology and the origins of Mirandese, followed by “Diversidades subdialectais do mirandês” (*Subdialectal diversities of Mirandese*) in 1960. Two years later, in 1962, the first book in Mirandese would be published by Mourinho – “Nôssa Alma, nôssa tiêrra” (*Our soul, our land*, cf. Annex) – following the orthographic rules in line with Vasconcellos’s guidelines. In 1984, Mourinho put out the first volume of “Cancioneiro tradicional e danças populares mirandesas” (*Mirandese traditional chansonnier and popular dances*).

In 1987, the First Meeting on Mirandese Language and Culture was held in Miranda do Douro. In this event, Raposo (1987, p. 55) argued that there were little literature in Mirandese and it was then of the utmost importance to produce more literature that would be felt as modern. According to this author, the fact that the teaching of Mirandese started officially in the school year 1986/1987 (as an optional subject in Basic Education in Miranda do Douro) would have a positive effect on the development and ultimately the survival of Mirandese. Added to this, other undertakings would also be highly significant, such as the creation of a Centre for Mirandese Studies (cf. web references), of literary competitions and of radio and TV programmes, the increasing publication of fiction and non-fiction books and also of dictionaries and, finally, the staging of plays.

In the aftermath of this event, considerable literary production has come to light, according to the information retrieved from the bibliography coordinated by Barros Ferreira (2015), in which we can find three sections on Zone Ia. Bragança/Miranda (Ferreira & Barros Ferreira, 2015, pp. 53-101), concerning themselves with language, literature and culture.

In relation to literature, this bibliography is organised into prose, poetry, theatre and traditional oral literature. In both prose and poetry, we can find an inescapable name: Amadeu Ferreira and his pseudonym Francisco Niebro. Apart from his various chronicles in newspapers and on blogs, we could mention “Las cuntas de Tiu Jouquin” (*The tales of Mr. Jouquin*, 2001) and “Lancanto de las arribas de l Douro” (*The enchantment of Douro’s Cliffs*, 2001), as well as some short stories, e.g. “Amanhai-bos cumo podirdes” (*Manage as you can*, 2001) and “La biaige” (*The journey*, 2001). It is also worth referring to some of Amadeu Ferreira’s works: “Ditos dezideiros. Provérbios mirandeses.” (*Mirandese proverbs*) and “Lhéngua Mirandesa: Manifesto an Modo de Hino.” (*The Mirandese Language: Manifesto in the form of a Hymn*), both from 2014.

As far as Amadeu Ferreira’s pseudonym is concerned, it is worth referring to “Las biaijes dua folhica” (*Journey of a little leaf*, a poetry book for children) and “L bolo de l beiso” (*The flight of the kiss*, with a Portuguese translation), both from 2001, “Cebadeiros” (the name given to the organic matter decanter that occurs in agriculture gutters) and “Deixa-te quedar” (*Stay put*, also with a French translation) from 2002. In later years, we could mention “Ars Vivendi Ars Moriendi” (2012) and “Belheç. Velhice.” (*Old Age*, 2015).

Amadeu Ferreira’s brother, Carlos Ferreira, is also among Mirandese writers and thus we should mention “Lhonas lindainas, sacadielhas, cuntas de camino I outras cuntas” (*Jokes, puns, charades, tales of the road and other tales*, 2002), “Cuntas que me cuntórum, seguidas de l Gato de das Botas” (*Tales I was told, followed by the Puss in Boots*, 2002) and “L miu purmeiro lhibro an mirandés. O meu primeiro livro em mirandês” (*My first book in Mirandese*, 2005), along with his 2001 play, named “L barbeiro que dou an doutor” (*The barber who became a doctor*). Francisco Niebro also published the play “Garabatos i Rodadeiras” (children’s toys made up of a wheel – *rodadeira* – and a curved stick that guides it – *garabato*) performed at the Basic Education School in Sendim, in 2001.

Furthermore, we must allude to the literary-competition-winner José Francisco Fernandes (“Miranda yê la Mie Tiêrra” > *Miranda is my homeland*, 1998, and “Miranda, Mie Mirandica” > *Miranda, my little Miranda*, 2002, in terms of poetry, and “Miranda, Cousas i Causos” > *Miranda, Things and Cases*, 2002, for prose), Tinta Nubrada with “Dies Cuntados” (*Counted days*, 2002, online), Emílio Pires Martins with “La proua de ser sendinês” (*The pride of being Sendinês*, poetry, 1999) and Manuel Preto with “Bersos mirandeses” (*Mirandese verses*, poetry, 1993).

Other less known names worthy of mention are Bina Cangeiro (“La fardela de las lhembrâncias” > *Memory Bag*, 2003; “La paixarina azul i outras cuontas” > *The blue butterfly and other tales*, 2010), Alfredo Cameirão (“Tortulhas. Cuontas deste mundo i de l outro” > *Tortulhas* (name of a rivulet). *Tales of this world and the other*, 2009), Valter Deusdado (“L Ancuontro” > *The Gathering*, 2011) and Fonso

Roixo (“L Purmeiro Libro de Bersos” > *The first book of verses*, 2009; “L Segundo Libro de Bersos” > *The second book of verses*, 2014).

In terms of traditional oral literature, we must touch on Mirandese collections of oral stories, which, in the case of this language, is of outstanding importance, since Mirandese was an oral language until the end of the 19th century, and thus its heritage is safeguarded in these stories that were passed on from generation to generation of Mirandese speakers and form also the core of its literature. In addition to Leite de Vasconcellos and Mourinho’s records, we should point out others worthy of mention, such as António Bárbolo Alves with three books from 1999 to 2002 – “Lhiteratura oral mirandesa – recuolha de textos an mirandés” (*Mirandese oral literature – text records in Mirandese*), “Cuntas de la Tierra de las Faias” (*Tales of the Land of Beeches*), “Cunta de bruxas” (*Witch tales*), “Las bruxas i l çapateiro” (*The witches and the shoe-maker*) and “La cunta de Juan Suldado” (*The tale of John, the Soldier*) –, Manuel da Costa Fontes, who compiled “Romanceiro da província de Trás-os-Montes” (*Chansonnier of the province of Trás-os-Montes*, 1987) and Maria Aliete Dores Galhoz, organiser of a volume entitled “Romances tradicionais” (*Traditional romances*, 1987).

A final word must be said about translation into Mirandese. As presented above, translation was conducted since Leite de Vasconcellos “discovered” Mirandese. Since then, translation has been conducted from various languages, namely from Latin, Portuguese and French. Examples of this activity, carried out by various authors, some of which already alluded to, consist of the translation of: (1) poems by Horace, Virgil, Catullus and Ovid, (2) the Fables of La Fontaine, (3) an anthology of Portuguese poetry, as well as “Mensagem” (*Message*) by Fernando Pessoa and “Os Lusíadas” (*The Lusíads*) by Luíz Vaz de Camões, (4) two Asterix’s adventures (i.e. “Asterix, L Goulés”, 2005, and “Asterix, L Galaton”, 2006³) and (5) liturgical texts and the four gospels.

1999 as the hallmark in Mirandese acknowledgement

Falar hoje sobre política linguística não interessa se se limitar à exclusiva indicação de formas concretas de difusão da língua, sem se saber exactamente onde, como e para quê.

(Mira Mateus, 2009, p. 73)

This excerpt by Maria Helena Mira Mateus reflects a shared feeling about the current state of Mirandese in Portugal. After 1999, little or nothing has been done by the central powers in terms of Mirandese language policy and thus the outcry of the mentors of Mirandese legal acknowledgement has been frequently heard. However, added to this, Barros Ferreira (2000, p. 57) elaborates by claiming that it is not only essential to reconstruct the language, but above all turn it into some-

thing cherished by everyone, to prevent it from crumbling down not long after. Protecting Mirandese comprehends also dignifying it so as to avert the stigma that has always surrounded its use (cf. “língua charra” vs. “língua fidalga”). Providing Mirandese with a spelling convention and official acknowledgement presents it in a completely different light: as an independent and self-sufficient language system and thus fully standardised (Barros Ferreira, 2000, p. 62).

Mirandese was acknowledged in 1999 as the second official language in Portugal, according to the law no. 7/99 (from 29th January) and following the Parliament session on 17th September 1998, where the law was unanimously voted. This law also acknowledges people’s right to speak Mirandese in administration and at school, where only Portuguese was allowed before (Martins, 2002, p. 58).

In addition to the law, the “Convenção Ortográfica da Língua Mirandesa” (*Mirandese Spelling Convention*) was also approved, whose existence was first supported by António Maria Mourinho (Barros Ferreira, 2000, p. 55). In 2000, an amendment to the convention was suggested, in order to integrate *Sendinês* into the common writing.

Barros Ferreira (2000, pp. 63-65) briefly presents the process by which the spelling convention was developed. It was first discussed in the Regional Meeting of the Portuguese Linguistics Association in 1993, with a view to facilitating the teaching of the language, which had started back in 1986/1987, without a recognised writing system. This was due to the fact that written Mirandese experienced great diversity of writing conventions: it varied from writer to writer and even the same author could write the same word differently and often in the same text. Therefore, in Barros Ferreira’s perspective (2000, pp. 63-64), the need for a spelling convention had to comply with two demands: on the one hand, the agreement of representatives of the main varieties of Mirandese and, on the other hand, it would have to achieve a level of abstraction that would enable different readings according to possible pronunciations. This required also reaching a compromise as far as written conventions were concerned, so that it could be used as a tool for collective recognition for all the language community. The team that would be in charge of this convention was made up linguists (most of which from the already-mentioned CLUL) as well as representatives of the different varieties of Mirandese. The first proposal for a convention was put forth in 1995 (Barros Ferreira, 2000, pp. 65-66), bearing in mind specific aspects, such as the historical perspective of the language, restricted graphical variation in the same words and respect for the fact that children could be using both Mirandese and Portuguese in a situation of bilingualism or diglossia, giving preference to the more economical forms, but without disregarding the individuality of the language in the Portuguese and Leonese contexts.

Returning to the Mirandese Spelling Convention, this document is divided into the following parts:

- (1) presentation of the document and general principles (1999, pp. 9-12), which explain the underlying guidelines for this convention;
- (2) Mirandese alphabet with the identification of its phonemes and the presentation of examples (1999, pp. 13-15);
- (3) particularities of Mirandese orthography and their pronunciation (1999, pp. 19-23);
- (4) orthography of diphthongs, especially the decreasing and increasing oral diphthongs, and nasality (1999, pp. 24-25);
- (5) complementary signs, i.e. accents, apostrophe and hyphen (1999, pp. 26-28);
- (6) orthography of morphological paradigms, such as definite and indefinite articles, prepositions and their contraction with the articles (examples of which were shown above), pronouns, conjunctions and connecting phrases, adverbs and adverbial phrases, interjections (1999, pp. 29-36)
- (7) conjugation of some verbs (1999, pp- 37-59);
- (8) brief lexical sample, with some toponyms, numerals, days of the week and family relations (1999, pp. 60-62).

Cristina Martins (2002, pp. 48-54) analyses the situation before and after the 1999 law according to a group of different criteria which are elaborated below, namely the legal framework, administration and political bodies, the presence of Mirandese in the media, the teaching of the language, chansonniers and literature, scientific writing, scientific conferences, work and publications and, at last, other promotion activities.

In terms of the legal framework, before the law, there was no legal recognition of linguistic minorities in Portugal, which was still presented as the oldest monolingual country in Europe. Moreover, before the law no. 7/99, it is worth mentioning another legal document produced by the Ministry of Education on 8th September 1985, which allowed Mirandese to be taught at schools in Miranda do Douro as an optional subject. After the law no. 7/99, a legislative order enshrined the right for formal learning of Mirandese in the public education system in Portugal, without being exclusive to Miranda do Douro.

As far as administration and political bodies are concerned, before 1999, Mirandese was only used in erratic posters and official invitations by the Miranda do Douro City Council and was spoken by the City Council President and other representatives in commemorative events. It should be alluded that the opening session of the Portuguese National Assembly was done in Mirandese by the then Member of Parliament Júlio Meirinhos, when discussing the proposal of the law that was to be passed. After the law, the language was more frequently used in the situations where it had already been under use, as well as in the regular sessions of the City Assembly in Miranda by some of its members. Nonetheless, Martins (2002, p. 58) states that, despite the legal recognition, the use of Mirandese is still residual.

Concerning the media, before the law, there is no known case of the use of Mirandese as a linguistic tool in newspaper activities and the interest in this language is residual. The media only started focusing their attention on this language with a view to presenting it in the shape of reports or documentaries. However, it must be mentioned that, even in the preceding period, the University Radio of Minho broadcast short humorous chronicles in Mirandese, twice a week, between 1994 and 1996, put together by António Bárbolo Alves. From 2001 on, news articles and chronicles have been regularly published in Mirandese on the website of the “Diário de Trás-os-Montes” (*Trás-os-Montes Daily Newspaper*), as well as a radio programme in Mirandese on the Radio Mirandum – FM, under Domingos Raposo’s responsibility. The role of mass media must not be overlooked, as Ferreira & Martins (2012) elaborate on, being an essential part in the assertion of a minority language within the context of a mainstream and overpowering national language.

Related to the teaching of the language, it was already referred that, since 1986, the language had been offered as an optional and after-hour subject in 5th and 6th years of Basic Education in Miranda. After the law, these teaching experiments went on and, in the school year of 2000/2001, the offer was extended to Sendim, another experiment was also carried out with primary school pupils and the first courses in writing Mirandese for literate adults were made available. Several Mirandese courses are opened in higher education institutions, such as at UTAD (University of Trás-os-Montes and Alto Douro) in 1999/2000, as part of the Master’s in Portuguese Language and Culture and as a free language course, but also at the School of Education of the IPB (Polytechnic Institute of Bragança) in 2004/2005, to mention just a few. The first summer course in Mirandese Language and Culture was organised in 2001, followed by another one held in 2011 with the participation of the Faculty of Arts of the University of Porto.

As for chansonnier and literature in Mirandese, Martins (2002, pp. 50-51) adds on to what was presented above. The Mirandese chansonnier was basically oral and there should be mentioned song festivals organised by the City Council. The year 2000 witnessed the creation of the Mirandese rock group called “Pica Tumilho, Agrícola Rock Band”⁴ from Sendim, which launched their first album “Sacho, Gaçpólia i Rock n’ roll” (*Hoe, New wine and rock n’ roll*) in 2000 and, in 2008, their second “Faíçca, uã stória d’amor e laboura” (*Faísca* (proper name), *a story of love and agriculture*), with all their songs in Mirandese. In terms of literature, in 1995, the first literary competition was promoted by the City Council, whose winner was José Francisco Fernandes (who died in 2015), and repeated again in 2001.

Scientific writing was non-existent in Mirandese before the law, although authors, such as Bárbolo Alves, Raposo and Amadeu Ferreira embody the first attempts. Related to scientific conferences, even before the law, there are some events that should be cited, namely the “Primeiras Jornadas de Língua e Cultura Mirandesas” (*First Meeting in Mirandese Language and Culture*) held in 1987, the 1993 Regional

Meeting of the Portuguese Association of Linguistics, which organised a round table on Mirandese, not to mention numerous meetings promoted by the Asturian Language Association. In the aftermath of 1999, events in and about Mirandese started cropping up in both Portugal and Spain, for instance, one such event is about ecolinguistics and minority languages, which is going to occur in June 2016 at the University of Aveiro and in Miranda do Douro, and the “1º Simpósio Internacional Línguas e variedades linguísticas ameaçadas na Península Ibérica: Documentação e revitalização” (First International Symposium on Languages and endangered linguistic varieties in the Iberian Peninsula: Documentation and Revitalisation), organised by CIDLES – “Centro Interdisciplinar de Documentação Linguística e Social” (Interdisciplinary Centre for Social and Language Documentation) in July 2016.

In terms of scientific work and publications, apart from the pivotal work by Leite de Vasconcellos and other publications by António Maria Mourinho, references to Mirandese are also made in the work of several authors, such as Joseph Piel (1930), Herculano de Carvalho (1952, 1957, 1960), Kurt Baldinger (1958), Ramón Menéndez Pidal (1962, 1968) and several other Portuguese scholars, namely Manuela Barros Ferreira, Telmo Verdelho, Cristina Martins, to mention just a few. Publications include proceedings of academic events and some dissertations and theses, the first of which was by Maria da Conceição Azevedo Moreira, entitled “A vida do povo mirandês através do seu vocabulário” (*The life of Mirandese people through their vocabulary*), a graduate dissertation in Romanic Philology by the University of Coimbra from 1962. In 1994, Martins defends her master’s dissertation at the University of Coimbra on the sociolinguistic situation of Mirandese, with a view to code-switching and language choice. Later, in 1997, António Bárbolo Alves is awarded his master’s with a dissertation on Mirandese lexicon by the University of Minho. After the law, the Spelling Convention is put forward in 1999, and its amendment in 2000, as well as numerous works on Mirandese by the above-mentioned scholars and by “Grupo de Estudo da Língua Mirandesa” (GELM – *Study Group on Mirandese Language*) created in this same year. In 2001, the website mirandes.no.sapo.pt is set up with the support of CLUL and has remained highly active since then. A year later, in 2002, António Bárbolo Alves presents his doctorate thesis to the University of Toulouse also on Mirandese lexicon. It should also be mentioned the fact that numerous academic work has been developed within the three study cycles of higher education (HE) in several HE institutions not only in Portugal, but also in other European countries (cf. “A situação da língua mirandesa – Bi- e plurilinguismo numa comunidade minoritária no Nordeste de Portugal” > *The situation of Mirandese language – bi- or plurilingualism in a minority community in northeast Portugal* (2014), by Evelin Gabriella Hargitai, from Budapest, Hungary). For instance, at the School of Education of the IPB, a piece of work from 2014 was conducted within the master’s in Social Education – “A língua mirandesa, um meio

de comunicação na socialização” (*Mirandese language, a means of communication in socialisation*) by Carlos Manuel Rêgo.

As far as other promotion and dissemination activities are concerned, Martins (2002, pp. 53-54) alludes to the creation of GELM in 2000 and of the “Associação de Lhéngua Mirandesa” (*Mirandese Language Association*) in 2001, whose headquarters were at the time in Lisbon. This same year, Barros Ferreira represents Mirandese in the National Committee for the European Language Day. From 2000 onwards, two websites start presenting texts in Mirandese, namely www.bragancanet.pt/picote (currently inactive) and www.sendim.net. Worthy of mention is also the setting up of the “Centro de Estudos António Maria Mourinho” (*Study Centre António Maria Mourinho*) in 2004. At last, one last example is related to the fact that the “Associação de Desenvolvimento Astúrias/Portugal” (*Development Association Asturias/Portugal*) has published, in 2015, a document in four languages: Portuguese, Spanish, Mirandese and Asturian, offering Mirandese the status of international language.

Taking the above-mentioned into account, Martins (2002, pp. 56-57) also discusses the patterns of diglossia in the periods before and after the law. With the approval of the law no. 7/99, the neglect for Mirandese linguistic idiosyncrasy, which always led to the hostility of outsiders (cf. the construction of Douro’s dams) and their discrimination of Mirandese speakers, should have been routed out. However, the stigma has not only set out from the “outgroup”, but also from the “ingroup” (cf. Gumperz’s concepts, 1982): when confronted with outsiders, Mirandese themselves started stigmatising speakers of their own language, enhancing the feeling of inferiority and ridiculousness.

Conclusion

The linguistic heritage of any country is unmistakably related to its linguistic varieties and also other languages spoken. The sheer idea that a country is so unified that allows no variety or variation is a fallacy that was proved wrong when the 800-year monolingual Portugal acknowledged Mirandese as its second official language. Therefore, in line with the Charter on regional and minority languages (1992), recognising these languages is “an expression of [national] cultural wealth”. This same document upholds that resolute action should be taken not only for encouraging the use of these languages in spoken and written and in both public as private life, but also for establishing cultural relations between national governments and local ones in their own languages. As a consequence, investment is paramount in the areas of teaching, from pre-school to higher education and also in adult and continuing education, which require, for instance, official coursebooks and teacher training, as well as of translation and interpreting, demanding also university training for these professionals. There should also be, at the very least, one TV and one radio channel in Mirandese, supported with financial assistance.

What Leite de Vasconcellos once called “the language of home, love and fields” has since then been equipped with the essential means (e.g. official recognition, original and translated literature) to become a standardised minority language. Nonetheless, Mirandese has also since then lost its three dimensions, being the family that which most suffered. According to Martins’s study (2002, p. 59), parents will only speak Mirandese to their children if they feel that “essa opção representa, quer para si, quer para a sua descendência, uma clara mais valia social e simbólica” and thus the highly important role of the school. Consequently, only those who are over 50 will be totally bilingual and proficient in Mirandese, whereas younger speakers will not be proficient in Mirandese, since their knowledge will be residual, even if they are studying it at school. In line with this, we uphold that Mirandese should be offered as an optional subject in all levels of study from pre-school to higher education, as well as in the whole country and not be restricted to Miranda do Douro and surrounding areas. Mirandese should also become a part of teacher training degrees to allow for the recognition of the language and the profession of teaching Mirandese. Based on these proposals, the language would bear the possibility of crossing the borders of Trás-os-Montes and be made available throughout Portugal, cheating extinction and avoiding entering the toll of dead languages.

According to Hagège (2009), a language can be lost in two generations and there is one language that disappears every 15 days: Mirandese has fooled death when Leite de Vasconcellos predicted its disappearance in the beginning of the 20th century, but the question remains – will it survive the new millennium in a country that has become oblivious to its existence and where family no longer plays the role of passing on the language from generation to generation? It is our strong belief that, throughout the whole process of “discovery”, defence and acknowledgement, the central government has failed Mirandese people, culture and language and ultimately Portuguese linguistic heritage as a whole.

End-of-text Notes

- ¹ For a more in-depth discussion of the myth of isolation in the context of Mirandese language, cf. Sérgio Ferreira (2011 and 2012).
- ² Cf. Blog “Os Caminhos de Ferro – Retratos e relatos do Portugal ferroviário”.
- ³ The new adventure “Asterix and the Missing Scroll” was launched in 2015 and will also have a Mirandese edition, according to the publisher ASA. José Pedro Ferreira, Amadeu Ferreira’s son, and Carlos Ferreira will be in charge of the translation.
- ⁴ “Pica Tumilho” means lavender mincer; this herb would be minced and then placed on the streets during winter to ferment with water and mud and later be used to fertilise the fields.

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Annex

| | |
|--|---|
| <p>La lhéngua mirandesa</p> <p>Quien dirie q'antre ls matos eiriçados, Las ourrietas i ls rius desta tierra, Bibie, cumo l chougarço de la sierra, Ua lhéngua de sonidos tan bariados?</p> <p>Mostre-se i fale-se essa lhéngua, filha Dun pobo que ten neilha l choro i l canto! Nada por cierto mos coutiba tanto Cumo la form'an que l'eideia brilha.</p> <p>Desgraciado d'aquel q'abandonando La pátria an que naciú, la casa i l huorto, Tamien se esquece de la fala! Quando Lo furdes a ber, talbeç que steia muorto!</p> <p>(José Leite de Vasconcellos, "Flores Mirandesas" ("Mirandese Flowers"), 1884)</p> | <p>La Nôssa Lhéngua</p> <p>Armanos cantai ã charro, Na nossa lhéngua q'hardêmos; La fala de nôssos pais Yê l pertués que tenemos.</p> <p>Ah! Fála nôssa i siêmpre biba, Falada i nunca screbida!... Tu sós La mais rica eiterna i nobre hardança Qã beisos de criança Me dórún cul pã negro Mius pai i mius abós.</p> <p>Falai-la, mius armanos. Guardai-la!... Stimai-la!...</p> <p>Yê fala probe, Mas nobre.</p> <p>Yê armana doutras falas Que falã ouropeus i amaricanos, Asiáticos i africanos... Baliêntes i cristianos!...</p> <p>...Se ã «charro» digo «mai»!... Fai-me lhembrar ternuras Agradables i puras De quien me dou sou peito Al son d' l amor nun ai!...</p> <p>Se chamo pur Jásus, Relhembro no miu seno, La fé, la eiterna lhuç... El bun bibir sereno Que m'ansinou a ber Miu pai cum' s' fusse a ler, No altar i nuã Cruç!...</p> <p>(António Maria Mourinho, "Nôssa Alma i Nôssa Tiêrra" ("Our Sould and Our Land"), 1961)</p> |
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Intensive Programmes Erasmus+ Mobility of Individuals

Product Development and Industrial Processing

Joint IPB/EAL course

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Abstract

This article aims at presenting a teaching experiment where the same course is taught simultaneously in two countries, Portugal at the Polytechnic Institute of Bragança (IPB) and Denmark, at Lillebaelt Academy (EAL). Project Based Learning (PBL) underlies the applied methodology.

As the project is still in its initial phase it is too premature to delve into a conclusive and thus critical approach. Nonetheless, we will highlight the course

methodological procedures and objectives as well as the educational gains to the students and to the two institutions involved.

Keywords: *teaching experiment, Project Based Learning, Product Development, Industrial Processing*

Introduction

Project Based Learning (PBL) is one of the most popular new teaching methodologies in the context of engineering teaching. Most of all engineering courses present some type of project evaluation at BSc or MSc levels. And several project configurations are possible while considering teamwork and project integration: having groups of students dedicated to a larger project where each one is concentrated into one specific issue; or having PhD students teaming up with MSc and BSc finalists are amongst common setups for obtaining synergies on applied research and teaching (supervising) goals. However, project courses are placed in the end of the student's journey and are considered, and evaluated, as a student's solo venture.

PBL methodology is being brought to the early phases of the engineering curricula, and in the case of the Lillebaelt Academy (EAL), it has been introduced into the very first semester of their engineering courses. Concurrently, at IPB, engineering courses based on PBL are rare and result from individual initiatives confined to 6 ECTS.

To identify and overcome the difficulties of implementation of a PBL based course in engineering, a 12 ECTS joint course from Lillebaelt Academy and Bragança Polytechnic Institute was created based on the Danish model: a 12 ECTS course named Product Development and Industrial Processing.

Project Based Learning methodology

Project Based Learning is a student-centred pedagogy in which students learn about a subject through the experience of solving an open-ended problem. Students learn both thinking strategies and domain knowledge. The PBL format originated from the medical school of thought, and is now used in other schools of thought too. It was developed at the McMaster University Medical School in Canada in the 1960s and has since spread around the world (Lee & Kwan, 1997, pp. 149-158). The goals of PBL are to help students develop flexible knowledge, effective problem solving skills, self-directed learning, effective collaboration skills and intrinsic motivation. Problem-based learning is a style of active learning (Felder & Silverman, 1988, pp. 674-681).

Working in groups, students identify what they already know, what they need to know, and how and where to access new information that may lead to the resolution of the problem. The role of the instructor (known as the tutor in PBL) is to facilitate learning by supporting, guiding, and monitoring the learning process.

The tutor must build students' confidence to take on the problem, and encourage the students, while also stretching their understanding. PBL represents a paradigm shift from traditional teaching and learning philosophy, which is more often lecture-based. The constructs for teaching PBL are very different from traditional classroom/lecture teaching.

The problem at hand

One of the most critical issues regarding PBL is the choice of the project. It should be open-ended, authentic (have a real-world context) and public. In this case the overall purpose of this project was to provide students with knowledge of composite materials, internal and external environmental conditions, apply innovation and development and production optimization in practice. It is based on recycling of plastic composites especially wind turbine blades.

The project is based on cradle-to-cradle philosophy, which is to produce products such that all are included in the closed biological and technical cycles - and thus completely disposed of waste.

The waste from plastic composites has different origins: old wind turbine blades, scrapped boats, train and automobile parts, trailers, waste containers, roof boxes, etc. Wastes from composite manufacturing contribute significantly.

This is a real problem that will increase over time. For instance, the amount of composite waste in Denmark was 7000 tons in 2010 (one third was manufacturing waste) and it is paid for depositing old windmill blades instead of recycling. More than 5000 Vestas wind turbines will be settled over the next 10 years and at global level, waste from wind turbine blades are estimated to 2.2 million tons in 2030 (Gill, 2012).

The economic potential of recycling of composites depends on:

- Technical solutions and opportunities;
- Regulatory requirements;
- Investment requirements for recycling facilities;
- Supply and demand of materials.

The Waste Directive (Directive 2008/98/EC) sets the framework for waste management. In Denmark there are no specific rules for waste management of composite materials although the EU Commission has announced that it will review existing targets to prevent, reuse, recover and recycling. Waste is a material related resource if composites are shredded and recycled. Figure 1 depicts the material from a shredded wind turbine blade that is being used in the Product Development and Industrial Processing course.



Figure 1: Straw like feature of a shredded wind turbine blade

The problem was presented by a Danish factory to both schools being protected by a Non-Disclosure Agreement signed by the coordinators of the project in both countries.

The course structure

The basic structure of the course is presented by the scheme in table 1, where the semester is divided into 4 periods: 3 with 5 weeks and a last one with 2 weeks. By the end of each 5-week period a student has to present a report that will be graded together with the final exam. The last period is dedicated to an “International Week”, where the students will have to travel to other country, in this case Portugal, and cross-check their work with the local students.

The course was structured for 15+15 students from both institutions that would have to work simultaneous at the same project, and subprojects, in Denmark and in Portugal. Regular videoconference meetings would be held between Danish students and IPB teachers, taking an external advisory role on the evolution of the Danish students’ projects. Lillebaelt Academy teachers would also follow up the Portuguese students’ progresses and would have the symmetrical role.

Table 1 illustrates the course structure and the chronogram with the expected interactions throughout the program. The 2-week visit in the international week

would be an opportunity for the Danish students also to perform laboratorial activities at the IPB's Mechanical Technology Labs and engage in cultural activities with their counterparts.

Table 1: The course structure where the arrows represent interactions between Portuguese teachers and Danish students and vice-versa

| Lillebaelt Academy (EAL) | | | |
|---|---|---|---|
| 5 weeks | 5 weeks | 5 weeks | 2 weeks |
| Innovation & technology development | Documentation project – design, calculation and blueprint development | Production – Development of the production phases and methodology | International visit - Laboratory work and cultural activities |
| ↕ | ↕ | ↕ | |
| Instituto Politécnico de Bragança (IPB) | | | |
| 5 weeks | 5 weeks | 5 weeks | |
| Innovation & technology development | Documentation project – design, calculation and blueprint development | Production – Development of the production phases and methodology | |



Figure 2: Danish teaching staff working with Portuguese groups at their visit during the Innovation and Technology Development module

Mutual opportunities

The opportunities for the IPB's contribution are threefold: providing the venue and conditions for the international visit from the Lillebaelt Academy students with tailored classes, sharing teachers' knowhow and providing laboratory experience. The structure of the course at Lillebaelt Academy is maintained but a new course is created at IPB mirroring the structure, organization and evaluation scheme already in use at Lillebaelt Academy.

There are large benefits to be harvested from both Institutions from this course. In the case of EAL, it must be emphasized the further development of their international model and opening the channels between Danish Higher Education entities such as EAL and foreign industry. The opening possibilities for Portuguese Higher Education entities such as the IPB to be closer to the Danish industry would also pose as a major gain.

For the IPB case it enables a hands-on experience on a Project Based Learning methodology for a whole semester that may become, in the future, a standard at IPB. This course will enable the IPB's staff to be involved and acquire expertise in the execution of a PBL course.

Future steps

The course is not finished so it will be premature yet to state the conclusions from this experience. How was the students involvement?; have they achieved minimum skills required for approval?; what were the forces against changes?; what were the problems in regards to coordination between teachers and between two institutions, EAL and IPB?; what is the global outcome of this experience? are amongst several of the questions that still need to be answered for future adaptations and dissemination of PBL methodology at the IPB.

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An Integrated Approach to Short-term Mobility for Visiting Lecturers

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Abstract

Student, teaching and non-teaching staff mobility is a fundamental aspect of internationalization in Higher Education in Europe. There have been several programmes that support mobility, in and outside the European context, such as the Erasmus+ programme. However, mobility is not the single expression of internationalization. Cooperation, joint degrees, intensive programmes for language learning, among others, contribute to a more open, solid and high quality education.

This article describes the process followed in the organization of short-term teacher mobility in the scope of the Erasmus programme, with the intention of providing valuable learning experiences to students of the destination HEI. This happened in 2014, and refers to the experience as a visiting lecturer in a master's degree in computer science. The experience was jointly planned and discussed with the degree coordinator, to provide adequate curricular integration.

The reflection about this experience highlights the idea that mobility should not be done isolated, as a single-episode event, without a work plan, and without the possibility of future collaboration. Teacher mobility should be reconsidered

so that it could effectively contribute to create solid international scientific partnerships and the development of joint pedagogical and professional projects.

Keywords: *Erasmus+ programme, computer science, joint cooperation, Distributed Computing in JavaEE.*

Introduction

The European Higher Education Area (EHEA), since the adoption of the Bologna process eighteen years ago, established the foundation for a more comparable and compatible higher education system. Adopting countries have been pursuing this goal by introducing several, and in some cases, substantial, legal and procedural changes that have been changing the way Higher Education Institutions (HEI) work and that have been contributing for a more open and thorough quality assessment system (European Commission, Executive Agency Education, Audiovisual and Culture, 2015).

The concept of internationalization has been evolving since the Bologna process initial adoption. While initially almost totally focused on student mobility, it is now seen as an opportunity for different forms of cooperation, development and quality assessment. It is recognized that internationalization brings several benefits to all the actors, such as students, staff, institutions and countries.

Mobility has been supported by several specific EU-funded programmes, such as Erasmus, Horizon 2020 (European Commission, 2010), Tempus (European Commission, 2014) or Erasmus Mundus, these two currently under the scope of the broader Erasmus+ programme (European Commission, 2015a). In addition, the Erasmus+ also includes the Lifelong Learning Programme, The Youth in Action Programme, Alfa and Edulink, which were previously independent programmes. Erasmus+ integrates these seven programmes in three key actions:

- Learning Mobility of individuals
- Cooperation for innovation and the exchange of good practices
- Support for policy reform.

The implementation of the programme started successfully in 2014, with the distribution of 75% of the total budget to national agencies, with student and staff mobility as the highest priority action. In spite of this, not many countries developed a national strategy for internationalization (European Commission, Executive Agency Education, Audiovisual and Culture, 2015). This is the case of Portugal, which does not have specific policy goals for internationalization.

When compared with the other countries, Portugal still has a long way to go in terms of expressiveness of mobility. In absolute numbers, Spain is leading with the highest number of students sent and received, followed by France, Germany, the United Kingdom and Italy. In relative terms, Luxembourg, Liechtenstein, Latvia, Lithuania and Spain have the highest percentage of outgoing students (European

Commission, 2015b). Portugal has relevance in terms of staff mobility (fourth) and Intensive Language Courses (third).

Nevertheless, most of the actions, including mobility, cooperation and joint degrees, are being implemented by the HEI. In fact, the institutions are encouraged to adopt and implement their own strategy for internationalization, a recommendation that has a significant expression in Portuguese HEI.

Many institutions have been defining internationalization strategies that include several dimensions, such as student and staff mobility, joint degrees, intensive programmes and others. Usually, the institution's strategy mentions, specifically, the need for integration and optimization of the mobility, with the goal of associating it with other kinds of cooperation. However, the implementation of these strategies is seldom performed in an integrated way, focusing on a single aspect and disregarding the others.

Every year, each institution, faculty or school opens a period for application by students, professors and non-teaching staff. Since financial support is limited, a selection process takes place. Students are drafted according to the number of completed ECTS in the degree, excluding others that were already involved in mobility programmes. Professors and staff are drafted according to the number of times that were involved in mobility programmes, disregarding the existence of previous contacts and projects with the receiving institution.

These criteria rarely follows the strategy defined by the institution, allowing mobility to happen in a single, disconnected and inconsequential episode. It can even happen supporting a mobility action of professors and staff with no idea of destination and with no previous contact or activity plan. There should be a careful and thorough reflection on the draft criteria so that the best applications can be sorted out and selected for funding, thus contributing to improve the impact of the internationalization process of HEI.

One of the main impact of professor's mobility is the possibility to bring to students the knowledge and skills that professors have in specific scientific or technological areas. There are specific work and competences, recognized in professors in European HEI, which can contribute to disseminate knowledge and contribute to build strong partnership and cooperation.

This was the main motivation behind the experience described in the next section. This happened in 2014, and refers to the short-term mobility as a visiting lecturer in a master's degree in computer science. The experience was planned, discussed with the destination degree coordinator, and designed to provide valuable knowledge taking into account the specific learning outcomes of the curricular unit. The specificity of the lecturer's technical knowledge created the mobility opportunity to reinforce the students' knowledge in that particular subject. In addition, meetings with the staff and professors were also planned, to find common research interests and the possibility of further cooperation.

This article reflects the process followed in a short-term teacher mobility in the scope of the Erasmus programme with the intention of providing valuable experience to students of the destination HEI, in integration with the curricular unit learning outcomes and benefiting from the specific knowledge of the visiting lecturer.

Lectures

The mobility experience occurred in 2014, starting with an initial approach to the responsible of the destination institution. This contact was performed by email, and allowed to narrow the focus of the action based on the specific knowledge of the visiting professor. This led to the contact with the degree coordinator, which suggested that the lecture could be performed in the course in “Distributed Computing Techniques” of the master’s programme in Computing and Automation Engineering, a follow-up of software engineering and object-oriented programming.

It was agreed that lectures about Distributed Computing in JavaEE would be very appropriate for the students, with the support of a Software Versioning System, such as Git.

Distributed Computing in JavaEE

The Java phenomenon defines more than a programming language. In addition to the object-oriented programming language, Java defines three different architectures:

Java Micro Edition – suitable for embedded, mobile and Internet of Things devices, with limited capacity in terms of memory and processing power;

Java Standard Edition – used in desktop computers, provides rich user interface, portability and connectivity for application development;

Java Enterprise Edition – used to develop enterprise wide applications, providing web-based user interface, communication, application life-cycle management, and others.

The latter defines a distributed computing architecture, providing for packaging of distributable components for deployment, a collection of standardized components, containers, and services for creating and deploying distributed applications within a well-defined distributed computing architecture (Yener, Theedom, & Rahman, 2015).

It is based on the concept of multi-tiered architecture, providing specific containers to deploy different aspects of enterprise applications. This allows the separation of concerns in terms of reading and writing data (data access tier), programme logic and processing (business rules tier), user interface (both web-based and desktop based).

Several technologies are available to develop the components of an enterprise application. In a total of six hours, spread through two days, students learned the importance and the architecture of the Java-Server Faces, the Enterprise Java Beans

for business logic implementation, and the Object-relational Mapping between entity objects and relational databases.

Although they already had had some contact with web-based technologies, such as the Hyper-Text Markup Language (HTML), Javascript and the PHP server-side scripting language, the structuring and modularity of the JavaEE platform was something that the students had not yet addressed. Moreover, the possibility of providing different access protocols, without adding extra code was something new, which made them realize the effectiveness of using this technology for building large scale applications. They quickly got comfortable with building scalable web services, independent of the graphical user interface, with less effort than the required by other technologies.

Overall, the experience was relevant and significant for students, although requiring better code organization and management. This led us to study version control systems with special emphasis on the distributed version control system with Git.

Distributed Version Control System with Git

Git is a free and open source distributed version control system. Version control is a system that records changes to a file or set of files over time, so that it is possible to recall specific versions later (Chacon & Straub, 2014). Version control is particularly important for programming and software projects management, which supports team management, developer collaboration and release management.

There are two types of version control systems models. The centralized model requires a server, hosted in a centralized computer, which contains all the versioned files, and clients, running on the software development team computers that check-out files from the centralized server. This setup has several advantages, allowing administrators and developers to know what everyone is doing and providing easy administration of the software repository. However, there are downsides. The single point of failure could compromise the work of everyone, possibly delaying for hours the collaboration between developers and making it possible to lose information in case of disk failure. Examples of centralized version control systems are CVS (Vesperman, 2006) and Subversion (Pilato, Collins-Sussman, & Fitzpatrick, 2008).

The distributed model does not rely on a single, centralized, server. Clients do not checkout working copies from a server. Instead, each client keeps its own replica of the whole repository. If any client malfunctions, the others do not suffer and can continue working and collaborating. Moreover, each developer can keep a private and individual software version control system in his own computer, making it easier to keep a record of the development history and versions. Examples of distributed version control systems are Git (Chacon & Straub, 2014) and Mercurial (O'Sullivan, 2009).

According to the advantages of distributed version control systems, it was decided to explore, in more detail, how Git can be used and how it can contribute to better programming and software development. Even if they will not use it professionally

in the future, students benefit from this knowledge because of the prevalence of programming languages in several curricular units; version control systems enables them to better organize the code they produce, and to do it faster.

Students learned how to create a distributed repository in their computer, how to commit the code to the repository and keep all the versions as they progress in the development of an application. They also learned how to roll back to a previous version and how to build test areas without interfering with the stable development.

Final Considerations

The EHEA defines and relies on a comparable and comprehensive higher education system, transversal to several countries. This paves the way for unrestricted mobility of students, teaching and non-teaching staff with several benefits to all the actors. Students experience new cultures, new ways to learn, new opportunities that contribute to a better citizenship. Non-teaching staff learn new methods of doing, new organization structures and new processes. Teachers have the opportunity to contribute to stimulate students, sharing his specific knowledge and, at the same time, understand how students from different countries build specific knowledge and how they react to a different learning approach.

Mobility contributes to the overall internationalization experience, fostering cooperation and experience exchange. This, however, should not be done isolated, as a single-episode event with no other consequences. The process of granting support to teacher mobility by HEI should take into consideration the existence of a work plan, the relevance of previous contacts and the possibility of future collaboration. The simple draft based on the number of mobility each teacher does not contribute to strengthen the internationalization success of the institutions and to contribute to effective cooperation.

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