

Language Portfolios in Engineering Courses: A Strategy towards Autonomy

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Abstract

Within the framework of the Bologna Process implementation, the Portuguese Higher Education institutions are redesigning their courses to aim at a new teaching paradigm which pushes towards autonomy, student-centredness and innovation. New classroom goals and curricula entail new forms of assessment, thus portfolios in higher education represent a move from traditional forms of assessment to a more authentic and holistic assessment that reflects student learning, achievement, motivation and attitudes. The alignment of assessment, curriculum and pedagogy through the use of portfolios is reflected in new educational policies in Europe, of which The European Language Portfolio and the *Common European Framework of Reference* are milestones of pedagogical language learning. This paper focuses on how language learning portfolios may provide engineering courses with a different tool for assessment and enhance the awareness of the key participants in the assessment process.

Introduction

The present political and social changes in Europe reflect an intensification in globalisation and economic competitiveness which have led to great transformations, turmoil and unprecedented challenges and demands, and which have their mirror image in the ongoing debate about the role of higher education institutions. Indeed, all over Europe, reflections and debates over the role of higher education institutions in a highly competitive context have emphasised the mismatch between higher education and the needs of employers in the new technology-driven society (Barbara, Ferreira, Morais & Lopes, 2005).

In 1999, the Bologna Declaration, signed by 29 emerged countries as a response to globalisation and the need for economic integration by introducing the principles of flexibility, mobility and harmonisation in higher education to a continent dominated by a still too fragmented and overly regulated economy. In a knowledge economy, higher education institutions have to have a central role in anticipating what the workforce's needs are to meet the necessities of the market. Hence the qualifications of the European workforce have to be built up based on a strong relationship with society, the market and applied research. Therefore, what the declaration aims to do is to establish an action programme in which there is a clearly defined common goal – the creation of a European Higher Education Area, following the idea of the European Economic Area – thus enhancing the possibilities of employability and mobility of its citizens while increasing the international competitiveness of European higher education (Reinalda & Kulesza, 2005). By harmonising the duration of the degrees and establishing clear learning cycles and a network of cooperation among European institutions, this intergovernmental arrangement, commonly known as the Bologna Process, is a policy response to changes taking place in European higher education.

The European Language Portfolio

The internationalisation and mobility of workers in Europe will undoubtedly continue to expand, particularly due to the current integration processes, and will increase cross-cultural contacts in the future. These developments will create greater demands for global communication and tolerance of cultural diversity. This suggests intercultural competence as a significant educational goal in all sectors of schooling (Kohonen, 2002). The idea of an economy based on a knowledge society conveys a vision of the future in which everyone participates in education and training throughout life and that, basically, learning empowers (*idem*). This is also the view shared by the European Language Council (ELC) on the issue of language learning in implementing the Bologna Process. By stating the crucial importance of language learning for European integration in general (especially connected to the concepts of *employability* and *mobility*) and for the creation of the European higher education area in particular, the ELC demands that the signatory states and the higher education institutions take concrete actions to meet the linguistic requirements of the Bologna Process.

If it is up to the higher education institutions to devise foreign language policies, it has been the responsibility of educational researchers to conceive of ways to promote the development of the personal and intercultural competencies of learners and to enhance their capacities for autonomous lifelong learning. In order to bring harmonisation and transparency to language learning and to improve the quality of communication among Europeans of different languages and different backgrounds (Council of Europe, 2001a), the Modern Languages Division of the Council of Europe published the Common European Framework of Reference for Languages (CEF) and the European Language Portfolio (ELP).¹ The former aims to define curriculum goals and assessment criteria, whereas the latter intends to guide the management and assessment of learning in the classroom (Hildén, 2002; Kohonen, 2002; Little *et al.*, 2003).

The CEF defines non-native language proficiency in relation to five activities: listening, reading, spoken interaction, spoken production and writing at six levels. The ELP is another keystone in language education, but whereas the CEF can be used to measure language-level proficiency in a norm-referenced assessment, the ELP is a tool linked with a democratic society and school system which presupposes some forms of assessment which also acknowledge individual progress. The ELP consists of three parts: *a language passport*; *a language biography* and *a dossier* (Council of Europe, 2001b).

The pedagogical function of the ELP is based on principles that support and promote the development of learner autonomy. If we understand learner autonomy (as Holec has defined it) as the capacity to take charge of one's learning, to hold the responsibility of determining the objectives, to define the contents of progressions, to select the methods and techniques to be used, to monitor the acquisition, and to evaluate what has been acquired (Holec, 1981), then the ELP can be a very useful tool in organising learning. Learners create a learning cycle by establishing the goals, reflecting on them and using self-assessment to measure their performance and how a certain activity may, or may not, have contributed to the larger learning process. This process enables learner to assume control of their learning, to be at its centre and to be responsible for it.

In the specific case of language learning, the language portfolio can allow the students to develop language skills and attitudes, as well as promoting a critical self-

¹ Both the Common European Framework of Reference for Languages and the European Language Portfolio have been developed for use in middle and secondary schools but are being adapted to higher education in many countries. After a workshop at the Helsinki Conference "Bi- and Multilingual Universities" in 2005, an international working group was formed to create proficiency scales for Languages for Special Purposes under the auspices of Cercles, the European Society of Language Centres, *cf.* Takala, 2007.

consciousness of their own role as active agents in the learning process, with an ability to assess their own progress, materials, activities and the learning arrangements (Nunan, 1988).

Portfolio Assessment

It is acknowledged that there are a wide variety of portfolio uses, nevertheless it is usual to distinguish between two types of portfolios in language learning: process-oriented portfolios, or learning portfolios, and product-oriented portfolios, or dossier portfolios. The learning portfolio usually includes process-related materials such as action plans, learning logs, drafts of work, comments from the teacher and peers, student reflections, submitted assignments, evaluation criteria, and checklists to evaluate progress with regard to explicit learning objectives. It normally emphasises reflective language learning and self-assessment. The dossier portfolios, on the other hand, are used to document learning outcomes usually for the attribution of marks in institutions or for the purpose of documenting language skills when applying for a job (Kohonen, 2002).

Both learning portfolios and dossier portfolios can reflect a vast range of assessment types connected with daily class activities, or with homework and private study research. The samples may vary from classroom tests, essays or other samples of different writing tasks, research projects, audiotapes, video-recordings of presentations of oral performances or other learning products (Brindley, 2003; Klenowski, 2003).

The use of portfolios for assessment purposes seems to be a reification of the shift in pedagogy that drives the student to the centre of the pedagogical relationship and parallels the shift from a quantitative tradition of assessment to a more qualitative approach, bringing forth a new model of assessment. The changes in our conceptual framework of curriculum and assessment were also followed by changes in learning theory, that is, in the way we understand how learning takes place. Epistemologically, the paradigm shift involved changing from a static, passive view of knowledge transmission to a more active view of knowledge construction that is seen as an interactive, organic process of reorganisation and restructuring by the learner (Klenowski, 2003). Constructivist views of learning see the learner as an active interpreter and constructor of knowledge based on experiences and interactions with the environment, where learning is conceived no longer as being stable but rather as a cumulative process. The student has to be engaged in making sense of new learning and how to integrate it, how to construct it.

In order for knowledge to be constructed and enhanced, periodic feedback from the teacher, peers or tutors allows learners to take stock of how well they are doing and develop meta-cognitive skills, to interpret the construction of knowledge, and to accelerate their learning (Hounsell, 2007). Aligning with Boud's concept of sustainable assessment, i.e., "assessment that meets the needs of the present without compromising the ability of students to meet their own future learning needs" (Boud, 2004, p. 39), Hounsell maintains that feedback should also be sustainable, in the sense that it should contribute to equipping the learners for learning in the longer term, prospectively, beyond graduation and moving into their careers. This sustainable feedback would involve metamorphosing feedback into *feedforward*, evidencing a clear concern with employability and lifelong learning.

Exploring Theory, Enhancing Practice

The implementation of the Bologna Process at ESAC

By 2010, all courses in the European Higher Education Area have to respect the Bologna principles, organisation and duration. At Escola Superior Agrária de Coimbra (ESAC), an Agrarian Sciences College of the Polytechnic Institute of Coimbra, the final regulations are under discussion so that they will be clear at the start of the

new academic year with newly designed courses. Our implementation started in the academic year 2007-2008.

In Portugal, and in many higher education institutions throughout the world, what is valued in the academic profession is the amount of scientific research developed and published by the teachers and not pedagogical issues, such as the quality of their teaching. Teachers are highly engaged in their research projects and concentrate the time devoted to assessment at the end of a year or semester. Although the engineering courses taught at ESAC have a high level of practical work demanded from students, still most assessment is carried out by final exams or final project work, usually conducted at the end of semesters, and student failure rates are very high.

With a pending deadline and a new teaching-learning paradigm on the horizon, there is great distress and resistance to change from the teaching staff, particularly because our institution's new regulations for all courses have abolished exams as the major tool of assessment. Although there is flexibility to accommodate the co-existence of different forms of assessment, continuous assessment is recommended as the type of assessment that best fits a student-centred model proposed by the Bologna principles², so that there can be an alignment between teaching, assessment and learning activities. This change in the assessment system will change the whole concept of teaching-learning and the underlying learning paradigm. Nevertheless, at the heart of the present debate lie not the philosophical benefits or detriments the new model will represent but, first and foremost, the exponential increase in the time teachers will have to devote to assessment set in a professional academic framework which underrates it.

Language Portfolios as a Strategy towards Autonomy

In this context of great debate and uncertainty, typical of periods of great change, the disciplines of English and Technical English, which have existed in the institution for over 20 years, will profit from the experiments in assessment methods over these decades, and we have chosen the dossier portfolio as the tool that best suits this new context.

We face the problem of how to develop our practice based on 'second-hand theories'. We clearly have to adapt pedagogical theories to our practice, and, from the synergy of the two, we hope to achieve the desired result: transformation of teaching practice in order to generate more effective learning. It is up to the teachers to struggle with and overcome the difficulties in bridging the gap between the new developments in assessment theory and daily assessment practice.

In the academic year of 2006-2007, I carried out the following pilot study³: all of the disciplines I taught were evaluated with a mixed assessment system, i.e., comprising a

² At the heart of the Bologna Process lies the establishment of a system of credits called the European Credit Transfer System (ECTS). Instead of measuring the teaching hours, it calculates the student's learning, i.e., the total workload the student will have in order to successfully complete a module or discipline, considering class attendance, research, self-study, peer work, etc. Hence, the ECTS system does not have an arithmetic formula linked to front-faced teaching but to competence achievement, and its widespread use in the signatory countries could represent a revolution in the whole concept of education.

³ The pilot study was carried out in isolation, with no support from the institution, and aimed at checking all problems that assessment by portfolio might generate when it would be my main system of assessment in the following academic year. One of its goals was to offer a range of activities to identify the better ones based on their success with the students. The success was measured not only by the acceptance of the new type of activities, but especially by the quantitative results of the final marks. Whereas in the academic year 2005-2006, 26 out of the 53 students enrolled (49%) had positive ratings, after the pilot experiment in 2006-2007, 43 out of the 54 students enrolled (79%) had positive ratings. Although students complained about the extra workload brought about by the elaboration of the portfolio, in the end, there was almost unanimous acclaim vis-à-vis the new assessment method. In their reflections on the

blended portfolio as well as final oral and written exams. In quantitative terms, the portfolio represented 25%, the oral exam 25%, and the written exam 50% of the final mark.

The type of portfolio devised to fit engineering courses can be described as a combination of the learning portfolio and the dossier portfolio: on the one hand, it contains learning plans, student reflections and checklists to evaluate progress; on the other hand, it has a core of submitted assignments that are used to document the learning outcomes and provide a mark for the institution's academic records. The portfolio matrix presented in Appendix 1 is an illustration of the blended portfolio and represents a first attempt to adapt theory into practice.

The matrix of the student portfolio is handed out at the beginning of the semester so that the building of the portfolio becomes clear and the expected performance more transparent, and the learning tasks and their goals are listed and clearly identifiable. How the students plan and develop parts 1, 2, 4 and 5 depend entirely on their personal choice. The descriptor just provides suggestions or guidelines.

As authentic assessment in language learning portfolios should focus on practices that are as close to realistic conditions of language use as possible, activities and tasks were created considering future needs to communicate in English as professionals and not as first year environmental engineering students. Since research suggests that the development of any skill is best facilitated by giving students, particularly science or engineering students, *practice* and not by simply talking about or demonstrating what to do, these tasks were planned to be as prospective and meaningful as possible. Furthermore, the variety of these tasks emphasises both how assessment can be put to the service of learning as an integral part of instruction and how multiple sources of data can provide more reliable sources for measuring student performance over a period of time than can final examinations.

I consider all assignments to be equally relevant and all have the same percentage when considering the final score. However, because two of these tasks (2 and 5) involve more logistic preparation for their implementation than the rest, I will focus on their description.

In task 2 (Attending a Lecture), I invite one of my colleagues to present a 30-minute lecture on a particular environmental issue of their choice using a slide show. The students have to imagine they have graduated and their employer has sent them to attend a lecture at which a specialist provides 'state-of-the-art' data that has to be reported in written form. Students take notes at the lecture and write their summaries based on their notes. As a language teacher, it is important both to assess the students' capacity to write based on note-taking and the capacity to understand a technical presentation and to observe how they engage in "real" spoken interaction with the invited lecturer to clarify doubts so that their writing makes sense. The invited lecturer usually serves as a model for what the future engineers desire to be: to be able to present great technical knowledge, to use information technology to help deliver the message, and to master the English language so that an international audience can share this knowledge.

This activity involves much more than a simple checkpoint test, and, therefore, it is more difficult to prepare. Transmitting knowledge is the easiest part of teaching. Providing learning opportunities that are meaningful and close to real activities is far more challenging. It is up to the language teacher to motivate the students and help them devise strategies for bridging the language gap between them and the invited lecturer. As all students have to present a slide show, individually or in pairs, at the end

portfolio, part E, 93% of the students acknowledged that they worked hard, and continuously, for the discipline and that they expected a positive overall score. The students' opinions worked as an incentive for teachers to accept the radical assessment changes to be implemented in the following year.

of the semester in their oral exam, this lecture can also represent a source of inspiration for quality work production.

The underlying philosophical approach of portfolios is that they promote autonomy in students. For this goal to be achieved, teachers have to progressively delegate pedagogic responsibility to learners in the course of their learning. Little has highlighted that 'the capacity for autonomy will be displayed both in the way the learner learns and in the way he or she transfers what has been learned to wider contexts' (Little, 1991, p. 4).

The second assignment I am going to refer to, Task 5, is a poster elaboration for a science fair. In order to provide a task that would allow a higher degree of autonomy development and, besides being realistic, would also let information transfer take place and critical thinking be tested, in this assignment a group of students (ideally 3) can imagine, write about and explain an innovative product or treatment for environmental engineering that they have devised. The students have been given theory about scientific poster layouts in Communication Skills and have analysed with the teacher the different types of posters on display in different departments, but they have never created one. In Technical English, we have studied how to write scientific abstracts and select keywords but only as mere writing exercises. In this task, it is demanded of the students that they have a capacity for "critical reflection, for decision-making and for independent action" (*idem*), in short, to be autonomous. The poster can include graphs, scientific descriptions, and formulae 'borrowed' from many sources as long as the references specify the source of information. After the elaboration of the poster, the students present their product to the class and defend it. Both the presentation and the poster are assessed by the students themselves and by their peers. For this purpose, they fill out self-assessment and peer assessment forms on which they attribute a mark to their own performance, to the performance of the other members of the group and also choose the poster they liked the most and the poster presentation that they had enjoyed the most. All this assessment is quantified using our grading scale from 0-20.

All written assignments placed in the portfolio should have an original with corrections and feedback from the teacher and a corrected version of it. The corrected version receives a stamp of quality and the final mark. All extra work that a student decided to hand in during the semester does not have a quantitative mark but only comments from the teacher on the work developed and the student's progress.

As these portfolios have been designed to be taken to exams to be used by the students as a source of information, the elaboration of a glossary can be relevant as a short-term tool, i.e., a personal, authorised dictionary of technical terms. Students are encouraged to develop the glossary in their portfolio as a systematised collection of technical words which increases as their knowledge develops and which should be carried out as a lifelong learning task.

Future Assessment

Given the pervading influence of the Bologna Process in higher education, university teachers in Europe are considering past methodologies, former experiments and rethinking the whole system of teaching-learning in a search for common solutions. One such common solution may be to devise authentic assessment, or assessment for learning, that may have positive educational influence on the learners. Among the tools language teachers are using, the CEF and the ELP have indisputable importance. They may raise the quality of language education programmes throughout Europe by deploying similar descriptors that meet the needs of the students and simultaneously help to foster national and international cooperation and benchmarking.

These two tools may be leading resources to put into operation the theoretical Bologna principles and individual teaching and learning, particularly concerning evaluation. Assessment may be at the centre of institutional change and may contribute to changing learners, compelling them into a more active, responsible and

autonomous role in learning, in tune with a society of rapid change. By emphasising personal growth, portfolios promote self-directedness, develop personal responsibility, enhance self-esteem, develop pride in quality accomplishments, stimulate creativity and encourage a holistic approach to problems to discern the best solutions beyond the scope of the classroom. In short, the future of assessment for learning lies in having a future-oriented assessment.

The Author

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Appendix

Environmental Engineering Technical English Portfolio Matrix	
Table of Contents	Descriptor
A. Identification	<i>A Personal File</i> : a description of family background, educational background, hobbies, plans for the future, reasons for choosing the course, etc.
B. Learning Plan/ Remedial Work/ Extra Work	1. What the student intends to study on his/her own in order to meet the proficiency level required by the discipline; 1.1. Exercises to practice the learning plan of the student; 1.2. Extra work the student wants to present.
C. Class Assignments: Performance Assessment Score 0/20 All written assignments have to be CORRECTED to be checked and stamped	1. <i>Group work on "Gloomy Picture"</i> – oral presentation (group work) show the capacity to sum up main points and communicate them orally to the class; show the capacity to answer questions from classmates & teacher; 2. <i>Attending a Lecture</i> – show the capacity to understand a lecture, to take notes and to write a summary of a non-native speaker of English delivering a lecture on a specialised issue on the environment; 3. <i>Environmental Debate</i> – show the capacity to express his/her own views on the environment, to present arguments, to counter arguments; 4. <i>Viewing of a film</i> ; capacity to fill in a worksheet on a documentary film; capacity to write a technical review; 5. <i>Poster presentation</i> – Group work – capacity to be creative and come up with a revolutionary treatment, product, etc, to be used in environmental engineering; 6. <i>Self-assessment</i> – the student considers what is the best mark to quantify the work carried out during the semester and presents arguments to justify the mark. 7. Overall portfolio (considering its 5 parts).
D. Glossary	English-Portuguese of all the words the student considers to be important for his/her vocabulary development; Portuguese-English or English-English can be complementary when describing technical concepts; the organisation can be A/Z, by topics or other.
E. Reflection	A global judgement of the discipline with positive and negative aspects, an opinion on how your learning took place, your personal point of view on the elaboration of the portfolio.

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