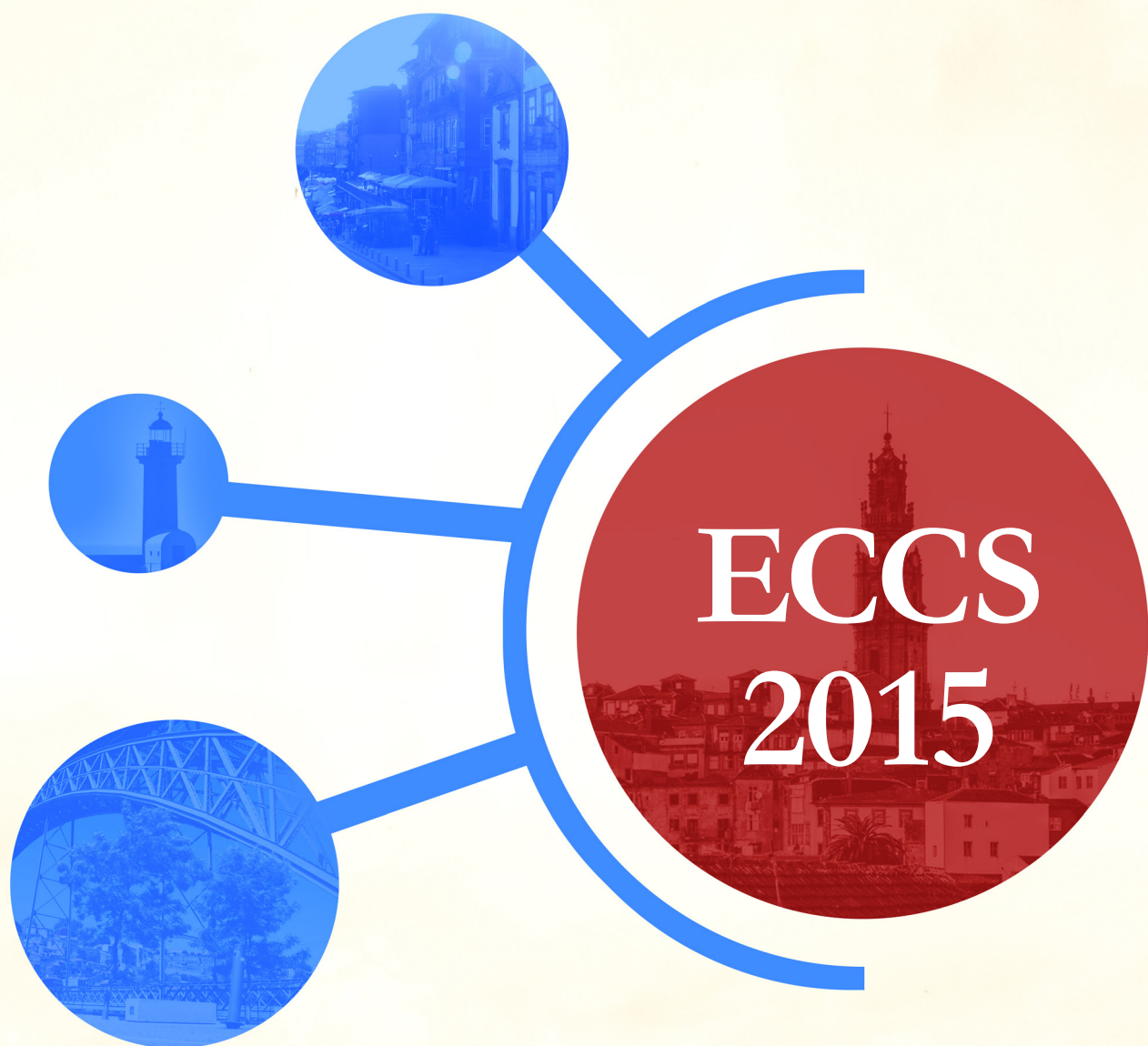


Curriculum Studies

Policies, perspectives and practices



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Curricula comparison of health and social management programs in Czech Republic, Finland, Portugal and Scotland

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Managing social and health care services places higher and higher demands on managers. Nowadays managers have to find ways how to deliver high quality services with less available resources. Clients' needs have become very complex and therefore they must be guaranteed to have an access to both social and health care services. Managers in order to provide quality services also need to be multidiscipline professionals. Usually they need to have an academic degree in a public health discipline and/or in social work. On the other hand they must be also well trained managers, who are able in turbulent times to lead multidisciplinary teams of experts to deliver excellent outcomes.

No wonder that the universities are asked to design special programmes in which 21st century social and health care managers could be trained. So far many of such programmes have been developed especially at national levels. Current experiences show that the national borders have to be overcome even in the area of new curricula development.

The aim of this paper is present how five European universities started work on Joint Master Degree programme in social and health care management. In order to achieve such a goal they needed to analyse the content of their curricula to define their similarities and to be aware of their differences. The comparison was made by curricula, usually programme's and modules' description, analysis accompanied by online interviews. This article presents the main findings of the curricula comparison.

The main objective of a curriculum development it's to address and answer to the societal needs and aims and to the results of the analysis do it by academics and professional about the competencies needed in future.

Share and build a curriculum between different Universities, with different background, experiences, interested, core competencies, culture, and way to do the "things" is a challenge and demands a carefully methodology design, in order to prevent a remission in curriculum coherence.

The idea to develop a curriculum in Health Care Administration at European level requires a strong commitment with knowledge and the idea of a common European framework of curriculum design. To answer to this we need

work on a curriculum comparison methodology, in same way defining a benchmark analysis of curriculum that is used at National level.

The involved programmes share many similarities in their general set ups. This finding can be documented mainly on the absolvents' profiles and learning outcomes' statements. Three main thematic areas can be identified in each involved programme. These areas are: health and/or social care systems, social research and management. On the other hand in Bologna declaration regulated environment surprisingly many differences have been discovered too. Different programme's documentation, length, credit values, modules' amount belong among the most important ones. The curriculum comparison has shown there is a good base for creation of Joint Master Degree programme in health and social care management if a careful attention is paid mainly to different national approaches to Joint Master Degree programme accreditation, each programme concrete ways of deliver and the proper choice of suitable technology for international collaborative learning.

Introduction

There is a common understanding that university curricula should address societal aims and represent updated disciplinary understanding and competencies (Levander and Mikkola, 2009: 275). The goals and correspondingly the curriculum content, however, are often a collection of more or less structured knowledge that has been passed on and evolved over time.

The main objective of a curriculum development it's to address and answer to the societal needs and aims and to the results of the analysis do it by academics and professional about the competencies needed in future. All curricula vary in the way that it is constructed (planned/designed), implemented and experienced, in one hand, and they are often governed by national legislation (Kako and Rudge, 2008), in same case European or International rules, in another hand.

Share and build a curriculum between different Universities, with different background, experiences, interested, core competencies, culture, and way to do the "things" is a challenge and demands a carefully methodology design, in order to prevent a remission in curriculum coherence.

The idea to develop a curriculum in Health Care Administration at European level requires a strong commitment with knowledge and the idea of a common European framework of curriculum design. To answer to this we need work on a curriculum comparison methodology, in same way defining a benchmark analysis of curriculum that is used at National level.

Curriculum evaluation is needed for decision making (around curriculum). It is difficult to over emphasise the inter-subjective nature of problems associated with processes and products, outcomes and the issue of value judgements – all are of critical interest in curriculum decision making (Hall, 2014: 344).

The curriculum design requires "a systemic view of designing teaching, constructive alignment calls for a systematic and outcomes-based approach from the teachers" (Levander and Mikkola, 2009: 276) to define the contents, the pedagogical methods, outcomes and the learning objectives. To develop an European Master Program in Health Administration its needed work with this particular curriculum design, but mixed this with all different partner, with the different perspectives.

Assuming that curriculum is “a deliberate set of planned learning opportunities”, so “curriculum requires scrutiny and evaluation of learning objectives, processes and content” (Hall, 2014: 343). When we have five different curriculum programs, that exist in four different countries and we wish develop a common curriculum between all of these partners, with all of these differences, we need work in the methodology of curriculum comparison. So, this article will apply to define a methodology to create a benchmark tool to compare the curriculum that each partner university as in Health Management area.

In this sense, this paper is structured as follow: first, we will provide an about comparative curriculum analysis and we will provides the research and benchmark methodology that supports our study; second, we will present some of the work than until this moment in this project; and third, some final ideas and conclusion for a good practices in curriculum comparasion.

Design methodology and State of the art in International Curriculum comparison

Its always complicated make comparison internationally, not only from different legal systems, but also a several cultural, practices and requestes differences. Even so, according to Bakalis, Bowman and Porock (2004) an international comparison of curricula is a relevant approach to compare the contents of education in various countries.

Levander and Mikkola (2009: 275) emphasises the benefits of Core Curriculum Analysis and of the deployment of a course description database as a tool for curriculum design.

When we work to develop a program we need establish some comparisons terms and concepts to define the main disciplines and knowledge that it's needed work to build the curriculum.

Curriculum evaluation is also about assessing the nature, impact and value of a curriculum through the systematic collection of evidence, analysis and interpretation of that information with the intention (aim) of making a decision. A variety of techniques such as questionnaires and interviews are useful to provide the comprehensive collection of information to aid curriculum evaluation.

We use a benchmarking analysis to make this international curriculum comparison; Hall (2014) proposes a model of curriculum analysis and evaluation – BEKA, incorporating four major steps, benchmarking, evidencing, knowing and applying. It is argued that this framework provide a powerful tool enabling understanding of actual process of teaching coverage of curriculum content and assessment, and demonstrate linkages between theory and practice. This is our roadmap to build the Joint Master Degree Programme in Social and Health Care Management.

In international curriculum comparison we need look for a several aspects and characteristics, such as: degree profiles, key programme competences, structures of the programme, study unit learning outcomes, education style, and assessment criteria and methods.

The project “Development of Culture and Quality of Care – Master’s Degree Programmes Enhancing Social and Health Care Management Competencies” (Careman) started in October 2013. There are 5 universities responsible for the project implementation (presented in alphabetical order), one from the Czech Republic (Charles University, Faculty of Humanities), two from Finland (Lahti University of Applied Sciences a HAMK University of Applied Sciences) one from Portugal (University of Évora) and one from Scotland (Edinburgh Napier University). The

project will end in September 2016. The purpose of the project is to develop a Joint Master Degree Programme, whose graduates will have attitudes, skills and knowledge needed for providing quality health and social care services in current Europe. A curricula analysis belongs among the project activities.

The aims of this project are:

- To develop an Erasmus Multilateral Master of Sciences program that combines and utilizes the strengths of the five collaborative Universities that already specialize in care management to create a European perspective.
- To produce high calibre post-graduates who are equipped with skills, theory and competence to effectively manage an integrated organizational culture to achieve optimal quality of care.

In Bologna Declaration European countries have agreed to implement student centred, outcome based and transparent higher educational programme on Bachelor, Master and the Doctorate level. For academic staff responsible for designing and delivering degree programmes, this means that the degree programmes should be organised in view of their desired results. The outcomes of the learning process should meet the aims of the programme, but also that those outcomes should meet the need and expectations of students and society, ensuring employment, personal development and citizenship.

Student-centred degree programmes must be designed in such a way that learners will develop the particular mix of competences considered useful and necessary for the academic, professional and / or vocational area. Learning outcomes state the extent and the level or standard of competence. The precise number of credits allocated to individual learning unit or entire programmes reflect the amount of time a learner normally needs to achieve the learning outcomes. The successful acquisition of these learning outcomes is verified at the end of the learning unit and / or the degree programme.

So, the objectives of the project will take in attention this reality, and they are:

- To compare, contrast and map the views, values and ideals taught in the participating master's degree programmes; those practiced in working lives; and the social and health care management and business management curricula of participating master's programmes,
- To use the mapping process outlined in 1 to develop a common part of curricula that will meet the aims of the project.
- To evaluate the joint degree process with a sample of students. This pilot program should be formalized in a joint degree between the five universities. In practice this would mean that a subset of each master's programme's yearly student in-take could choose this joint degree path in their studies. The other students would continue their studies according to each university's own curriculum.

The first step is the benchmarking analysis and that is the next section.

Curriculum analysis results.

The significant factor influencing formal appearance of the analysed documents was the fact, that all the universities come from the countries taking part in Bologna Process, and therefore studying programmes founders

had to somehow reflect on recommendations of the Framework of Qualifications for Higher Education Area (EHEA Framework). Particularly they had to reflect on recommended learning outcomes for the second studying cycle. Despite this fact from the results of comparison it is obvious that there are notable differences among the universities and their similarly oriented studying programmes. Some of them may be noticed just by comparing the studying programmes general descriptions as it is shown in Table 50, for others more in depth analysis has to be executed.

	Czech Republic	Finland	Finland	Portugal	Scotland
	Charles university, Faculty of Humanities	HAMK University of Applied Sciences	Lahti University of Applied Sciences	University of Évora	Edinburgh Napier University
Acronym	CU	HAMK	LUAS	UoE	ENU
Studying programme title	Management and Supervision in Social and Health Care Organisations	Management and Development of Social and Health Care	Management in Health and Social Care	Administration of Health Units	Health Administration
Minimal entry requirements	Bachelor degree plus entrance exam	Bachelor degree in subject related to nursing, social services, physiotherapy or equivalent	Bachelor degree	Bachelor degree	Honours degree in a subject related to health sciences or management. English Language: IELTS 6.0 equivalent
Language	Czech	Finnish	Finnish, English	Portuguese	English

Table 50: General overview and comparison of each curriculum

Following common features can be defined from the formulated graduates profiles (CU, LUAS, ENU), mission statement (CU) and/or studying programme's aims (UoE), some ideas can be described:

- All universities seek for graduates well prepared to work at managerial positions (in CU case they can be also supervisors) in social and/or health care.
- The graduates should have leadership skills, they should be active also as experts at both national and international levels.
- All graduates should be prepared to manage provision of quality services in rapidly changing and uncertain environment.

- To successfully manage social and health care services all the graduates will have to know specifics of national and international health and social care systems.
- The graduates will have to adopt managerial skills and while managing organisations they will have to be able to use knowledge gained through social research.
- Necessary graduates' skill will be their ability to work within a multidisciplinary team and also their ability to undertake lifelong learning.
- All graduates will have to be able to act ethically while being responsible for health and/or social care providing organisations.

Particular universities then may stress some specific aspects in their graduates' profiles and/or mission and goals' statements of their studying programmes. For CU for instance it is important that its graduates understand and are able to react to the needs of disadvantaged groups. ENU expects its graduates to perform well at international level. UoE wants its graduates to get involved in the social stability and social cohesion supporting processes.

Only two universities (LUAS and ENU) defined in their curricula learning outcomes in the format recommended by EHEA Framework for the second study cycle. LUAS presents the competencies described in Finnish National Qualification Framework.

The subject of the next analytical work was to compare the structure and the timing of particular studying programmes. Table 51 introduces a basic description of the studying programmes' modules.

	Czech Republic		Finland		Finland		Portugal		Scotland	
	CU		HAMK		LUAS		UoE		ENU	
Compulsory	Health and Social Care Systems	5	Changes in Operating Environment ⁵⁶	10	Management and Workplace Organisation	5	Strategic Management of Health Units	5	Leadership and Finance for Effective Service Delivery	10
	Ethics in Helping Professions	2	Dimensions of management	5	National and International Challenges in the Health and Social Sector	5	Research Methods in Healthcare Services	5	Behaviour and Management in Organisations	10
	Supervision in Social and Health Care Organisations	5	Strategic Leadership and Economy in Social and Health Care Field	5	Management Theory and Practice	5	Health Economics	5	Contemporary Human Resource Management	10
	Human Resource Management	4	Human Resource Management	5	Strategic Management	5	Clinical Governance	5	Clinical Governance &	10

⁵⁶ In the framework of this module the students have to choose two out the three following modules: Change and Foresight Methods (5), Work-related Research and Development Skills (5), Development of Social and Health Care Practice (5)

		in Social and Health Care					Improvement Practice		
Communication workshop	5	Management in projects	5	HR and Competence Management	5	Health Politics	5	Exploring Evidence to Improve Practice	10
Law in Management Practice	2	Developing work Community	10	Operational Quality and Performance Assessment	5	Epidemiology	5		
Qualitative research in health and social organisations	6			Social and Health Economics	5	Marketing and Communication in Healthcare Units	5		
Quantitative Research Methods in Practice	3			Research-Based Development	5	Accounting and Finance of Healthcare Units	5		
Diagnosing Organisations	5			Methodology and Communication Studies (Investigative Writing, Methodology)	5	Health Information System Management	5		
Quality in Health and Social Care	4			International Health and Social Care	5	Logistics in Health	5		
European social policy systems	4					Health Organisation, Quality Management	5		
Health Systems in International Comparison	4					Organisational Behaviour and Human Resource Management	5		
Health and Social Services from the users perspective	2								
Foreign Language Presentation	2								
Practice in Management	5								
Introduction to Financial Management	4								
Introduction to Economy	2								

	Management Theory and Practise	6							
	Financial Management and Business plan	6							
	Community development	2							
	Law in management practice	2							
Thesis		28		30		30		0	Health Administration Project 30
Optional modules		12	Competence Development in a Network Environment	5		10		0	Contemporary Ethical & Professional Issues in Healthcare 10
			Supervision and Consultation in work community	5					International Health and Social Care 10
			Leadership of Expert organisation	5					

Table 51: Studying programmes' module structure (course and ECTS)

Table 51 clearly shows different approaches to designing a studying programme module structure in particular universities. UoE offers to its students just compulsory modules and leaves them thus no space for any individual choices. Remaining universities combine compulsory modules with optional ones, CU even adds compulsory optional modules that all students of management specialization have to select. Supervision specialization has its own composition of compulsory optional modules. Beside UoE all other university students must finish their studies by defending of their thesis for which they receive 30 ECTS credits. CU is the only exception as its students receive just 28 ECTS credits for their thesis defences.

The number of compulsory modules varies from university to university. Whilst ENU studying programme consists of 5 compulsory modules with donation of 10 ECTS credits for each module, in case of CU there are 13 modules with different number of credits. The reason for such a high number of modules is at the faculty used practice according to which it is not possible that one module extends the timeframe of a semester. HAMK offers seven 5 ECTS credited compulsory modules, LUAS 10 and UoE 12. While taking into consideration content composition of the modules, they can be divided into 3 main thematic groups. The first group could be named Management. Table 3 shows the compulsory modules that might be classified into this group.

	Czech Republic		Finland		Finland		Portugal		Scotland	
	CU		HAMK		LUAS		UoE		ENU	
Compulsory	Human Resource Management	4	Dimensions of management	5	Management and Workplace Organisation	5	Strategic Management of Health Units	5	Leadership and Finance for Effective Service Delivery	10
	Supervision in Social and Health Care Organisations	5	Strategic Leadership and Economy in Social and Health Care Field	5	Management Theory and Practice	5	Marketing and Communication in Healthcare Units	5	Behaviour and Management in Organisations	10
	Communication workshop	5	Human Resource Management in Social and Health Care	5	Strategic Management	5	Accounting and Finance of Healthcare Units	5	Contemporary Human Resource Management	10
	Law in Management Practice	2	Management in projects	5	HR and Competence Management	5	Health Information System Management	5	Clinical Governance & Improvement Practice	10
	Quality in Health and Social Care	4			Operational Quality and Performance Assessment	5	Logistics in Health	5		
							Health Organisation, Quality Management	5		
							Organisational Behaviour and Human Resource Management	5		
Compulsory optional	Law in management practice	2								
	Practice in Management	5								
	Introduction to	4								

Financial Management									
Management Theory and Practice	6								
Financial Management and Business plan	6								

Table 52: Modules with management orientation (course and ECTS)

Thematic modules' orientation could be further categorized. Studying programmes of all universities contain a module oriented to gaining competencies in the area of Human Resource Management. Financial Management (CU, UoE, ENU), Quality Management (CU, LUAS, UoE, ENU) and Strategic Management (CU, HAMK, LUAS, UoE) are also frequently represented in studying programme's structures. Some modules can be found among compulsory modules of just one university. CU's Law in Management Practice, HAMK's Management in Projects, LUAS's Management and Workplace Organisation, UoE's Marketing and Communication in Healthcare Units belong to those modules.

The second compulsory modules' thematic group could be entitled Social Research in Management. Table 53 presents the social research modules belonging to this group.

	Czech Republic		Finland		Finland		Portugal		Scotland	
	CU		HAMK		LUAS		UoE		ENU	
Compulsory	Qualitative research in health and social organisations	6	Work-related Research and Development skills	5	Research-Based Development	5	Research Methods in Healthcare Services	5	Exploring Evidence to Improve Practice	10
	Quantitative Research Methods in Practice	3	Societal Change and Foresight Methods	5						
	Diagnosing Organisations	5								
Compulsory optional modules for management specialization	Practice in Management	5								

Table 53: Modules with social research orientation (course and ECTS)

As it can be seen all the universities, except UoE, focus on building competencies strengthening their graduates' ability to use social research outcomes while managing social and/or health care organisations. Studying programmes founders wanted the graduates to be able to meaningfully incorporate outcomes of social research in their work and to know both its limits and possibilities. In case of credits donation of these modules, LUAS and UoE can be found at one side. Their students will receive 5 ECTS credits after accomplishment of all social research oriented compulsory modules. CU stands on the other side with 18 ECTS credits. In HAMK's case the amount of obtained credits can vary based on a student choice from 5 to maximum 10 ECTS credits. 10 ECTS credits receive students in ENU as well. CU asks its students to diagnose management of one specific organisation in the second semester and subsequently to implement an organisational change in the same organisation. Other universities do not impose similar requirement on their students. They remain either at the level of introduction of research methods (UoE) or description of use of social research in an organisational development.

Social and/or health care systems and policies is the last thematic category. Table 54 presents the modules belonging to this category.

	Czech Republic		Finland		Finland		Portugal		Scotland	
	CU		HAMK		LUAS		UoE		ENU	
Compulsory	Health and Social Care Systems	5	Societal Change and Foresight Methods	5	National and International Challenges in the Health and Social Sector	5	Health Politics	5		
	European social policy systems	4			International Health and Social Care	5				
	Health Systems in International Comparison	4								
Optional									International Health and Social Care	10

Table 54: Social and/or health care systems and policies modules (course and ECTS)

From the table the awareness that particular universities pay to introduction and/or comparison of health and/or social care can be defined. Whilst ENU considers this module optional, for other universities it is a compulsory one. Required competencies are built with a help of one (HAMK, UoE), two (LUAS) or three modules (CU). Studying programme founders believe the graduates must be able to describe the systems of health and/or social care they must be also well informed about the actual health and/or social care policies. CU wishes its graduates to be able to compare adjustment and performance of different health and social care systems. Taking into consideration time consuming study measured by number of ECTS credits then for fulfilment of all studying obligations in HAMK and in UoE will be awarded by 5 ECTS credits, by 10 credits in LUAS and ENU and by 13 ECTS credits in CU.

The key competences to be developed by the learner in the framework of the degree programme can be described as following:

- Competences represent a dynamic combination of cognitive and metacognitive skills, demonstration of knowledge and understanding, interpersonal, intellectual and practical skills and ethical values.
- Competences are developed in all course units and assessed at different stages of a programme.
- Some competences are subject-area related (specific to a field of studies) while others are generic (common to any degree programme).
- The competence proceeds in an integrated and cyclical manner throughout the programme.

The key programme competences should be the most important ones that the graduate will have achieved as a result of the specific programme.

If the profile statement gives the overall aim of the degree programme, the degree programme learning outcomes show how this overall aim break down into different abilities developed by the students as a result of undertaking the degree programme.

The purpose of learning outcomes is to describe accurately the verifiable learning achievements of a student at a given point in time, for example at the end of a degree-course, study module or a period of learning in the workplace.

Learning outcomes describe what a learner is expected to know, understand and be able to demonstrate after successful completion of a process of learning. Accordingly programme learning outcomes express what a graduate of the programme demonstrably knows, understands and is capable of doing after completing successfully the degree programme. They are statements of concrete verifiable signs that witness or certify how the planned competences, including the required levels of knowledge, are being developed or acquired.

Statements of learning outcomes can be formulated to describe any type of learning that can be validated, whether it is achieved in a formal or a non-formal or informal setting.

When degree learning outcomes are examined, it is usual to break them down into categories. There are certain categories that typically appear such as knowledge, skills and attitudes. Another way of dividing them is used in the UK: Knowledge and understanding, Intellectual / Cognitive Skills, Practical Skills and Key Skills. In this comparison, a combination of these is used. It includes 1) Knowledge and Understanding, 2) Cognitive skills and application, and 3) Generic skills .

The Learning outcomes, after completing the programmes, are:

1. Knowledge and Understanding: the students are able to:
 - have broad and advanced knowledge of the chosen field to enable them to contribute to the development of the sector
 - have in-depth knowledge of the sector, its role in the wider economy and society
 - have a systematic and critical understanding of the key concepts in strategic and operational health administration

- have a critical understanding of the social, political and personal context of leadership
- have a critical understanding of the contribution that Human Resource Management processes can make to the administration of health and related services
- provide students with adequate and solid scientific training in Management

2. Cognitive Skills and Application – students are able to:

- follow and analyse research and development of the sector
- solve demanding problems using research and / or innovation methods
- develop new knowledge and procedures
- apply and combine knowledge from different fields
- (by appraising competing theoretical perspectives) to undertake a Health Administration project as well as underpin own evidence-based practice
- analyse the factors that influence the quality management within health units.- is able to apply subject-specific knowledge in a range of work-related situations
- analyse the impact of their own organisational role and approaches and devised ways of making these more effective
- demonstrate independent and creative thought in an interpretation of complex material.
- work independently in demanding expert roles
- lead and develop complex, unprecedented and novel strategic approaches
- evaluate the performance of individuals or groups
- accumulate knowledge and practices in the chosen field and / or take charge of other people's development

3. Generic skills

- have skills for life-long learning and continuous professional development
- are capable of professional communication
- communicate orally and in writing to both specialist and non-specialist audiences
- communicate at an advanced international level and interact in one official language and at least one foreign language
- have skills for networking and cooperation
- be engaged in critical learning and made use of constructive feedback

- have employability skills: time management, problem solving, team working, information handling, and presenting written arguments
- Work as an entrepreneur

Similarities between programme learning outcomes lead the way to formulate those of the joint training. The shared learning outcomes could be summarized as following:

- Knowledge and Understanding
 - The students know and understand the concepts, purposes, influences and the context of leadership and management in the field of social and health care and in the society
- Cognitive Skills and Application
 - The students are able to utilize knowledge, research and innovative methods and apply those in complex situations in their work field.
 - The students are able to take responsibility for the development of the practices in their field and carry out leading tasks independently and professionally.
- Generic Skills
 - The students possess good oral and written communication skills and are able to act fluently in interpersonal cooperation and networks.
 - The students have good problem-solving skills and they can show personal and intellectual autonomy: self-management, critical thinking and setting goals.

Another, yet minor, difference between programmes concerns their connection to competence-based approach. Some learning outcomes do not necessarily describe the actual learning outcomes. Instead, the learning outcomes are perceived from the general point of view such as: to provide students with training of Management. These features appear very little within the programmes.

Some conclusion and topic ideas

Comparing curriculum always is critical. The differences between the curriculum's, the reality of each country, the pedagogical cultures of each university is a critical issue that will be need worked to create a European Programme in this topic, and all of the topics.

We can find differences between the Bologna rules in each country and also a critical issue about ECTS (European credit transfer system) we find; each university, accordingly National rules in same case, count 1 ECTS differently, per example: 1 ECTS in ENU are 20 work hours and in UoE are 26 hours.

Another key issue are the cultural position and approach to lectures and learning process that has different perspectives from these universities and countries.

Even so, after do this benchmarking analysis, the team project develop a first stage to create the European Programme with 30 ECTS working in three main topics: human resource and knowledge management, quality management, and assurance intercultural management.

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Cooperation in Science Teaching: The students' contributions, speeches and arguments

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In this paper, we acknowledge curricular practices and other perspectives used for the teaching work in Science teaching, contributing to Teacher Education studies. The specificity of other approaches is sought, whether centered on the relationship between young people and those who them, and their skills to identify how to learn best, assuming a special focus on teaching, explaining and learning Science through the discourse of young secondary students. Different practices and interaction in educational domains are identified in order to achieve better results in school work, through studying the way students «see science education», therefore accomplishing better learning skills and curricular justice in the school environment. In the course of research and review of the literature it is noticed in the speeches of students a reluctance to follow the studies in science (Cachapuz, Gil-Pérez, Pessoa de Carvalho, Praia & Vilches, 2005). This "crisis of science education" (Pozo & Gómez Crespo, 2009:15) is manifest in the classroom with the teaching of a form of science disjointed of scientific knowledge which sometimes is translated into a decontextualized learning. Generally, and consequently, students reveal discomfort, doubt and anguish to continue their studies in vocational areas where science subjects – Mathematics, Physics,