On How to Build a Curriculum of an e-Business Master Course

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Abstract: The Business School of the Polytechnic of Porto, Portugal aiming at following the demands of the region decided to make available a master's degree program in e-business. This paper describes the study held ascertain the most relevant skills to be considered in the master program. In order to obtain relevant feedback, an interview was conducted to professionals working in the field. Also, a questionnaire was applied to the students attending the last year of undergraduate after working programs, since they have already professional experience in related fields. The most relevant skills were identified, and curriculum was defined for the master's degree according to the analysis of the results of these activities.

1 INTRODUCTION

The Polytechnic of Porto (P.PORTO) is a Higher Education Institution (HEI) and the biggest polytechnical institution in Portugal with almost 19000 students. P.PORTO is composed of eight Educational and Research Units, designated by Schools, whose mission is to teach, research and provide services in the areas of their specific attributions and with scientific, pedagogical, administrative and financial autonomy. The Business School (ISCAP) is one of those eight schools being the second biggest school of P.PORTO with more than 4500 students. ISCAP provides, at the time of writing of this paper, thirteen bachelor degrees and sixteen master degrees, providing other sixteen post-graduation courses of one year and three professional courses of two years.

P.PORTO is located in the North of Portugal, a NUTS III region that has 39% of the population of Portugal, exports 39% of the national products and represents 29% of the Portuguese GDP. Textile clothing and automotive products dominate the international specialization profile of the Northern Region, but the greatest contribution to the growth in the value of regional exports in 2017 was achieved by automotive products, machinery and appliances; electrical material and common metals (Norte Estrutura - Gabinete de Estudos e Avaliação de Políticas Regionais, 2019).

ISCAP aims to follow the demand or even anticipate it by not only creating courses adapted to the needs of the region but also to the needs of the countries that have Portuguese as official language (POL). There are students from Angola, Brazil and Cape Vert following courses in ISCAP, these are the richest POL countries but ISCAP aims to reach also students from Mozambique, Guinea Bissau and East Timor.

In the year of 2015 ISCAP decided that the demand of the business context of the region needed an e-business master course. This course aims to serve professionals of the Portuguese companies that want to understand how to adapt their traditional business' to the ever development of technologies, and to the new ways of doing business using new methods and techniques provided by the specific characteristics of e-business such as ubiquity, global reach, interactivity, personalization and customization, richness and density of information (Turban, et al., 2018, p. 17).

This paper presents the methodology followed to define the curricula of the course and presents how

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the results of the survey and inquiry influenced the definition of the course.

The goal of the research presented in this paper was to define the skills for a new master program on e-business using scientific methods. Interviews were put in practice to professionals working in the field of e-business, and questionnaires were applied to final year students of some after working hours degrees, and to graduate students who are already in the labour market, thus already having professional experience in related fields. The analysis of the questionnaires and interviews used both qualitative and quantitative approaches. The analysis of the interviews revealed the interest for the proposed program, anticipating good levels of employment to future holders of the degree. The analysis of the questionnaires showed that students demonstrated a high interest in the proposed program, expressing interest in attending it, possessing high expectations about the quality of the course.

This paper is organised as follows. The second section presents a brief presentation of the master's degree; section 3 presents the method used in the research; section 4 the results and section 5 a discussion. The paper ends with the presentation of the conclusion and future work.

2 BRIEF PRESENTATION OF THE MASTER'S DEGREE

E-business refers "primarily to the digital enabling of transactions and processes within a firm, involving information systems under the control of the firm." as defined by Laudon and Travers (2018, p. 9).

This master is located at the confluence of the areas of Information Systems and Management. The specialized technical training in these scientific areas in the context of Electronic Business is further complemented with training in other scientific areas such as Law and, Languages and Cultures.

At the end of the program the master in electronic business should be able to: i) know and critically analyse tools, techniques, and methodologies specific to electronic business; ii) develop analytical skills using concepts that come from a wide range of areas, aiming the structuring and developing of solutions within the scope of the Electronic Business; iii) conceive, develop, and promote electronic business in an organization, including processes, technologies, and people; iv) develop, under guidance, applied research projects, namely action-research projects, about specific issues in the area of electronic business.

3 METHOD

The authors started by developing a list of the skills considered as most relevant for the master in e-business. This list was built based on the author's personal experience and based on results of the establishment of the state-of-the art of similar programs in the European Union. Difficulties were found, since there were few similar programs and the vast majority of the already implemented programs were more focused on digital marketing and e-

Table 1: List of skills considered initially.

Soft Skills	Management Skills	Information Systems Skills
Q.1.1. Leadership	**Q.2.1.** Comprehensive view of the business	**Q.3.1.** Business analysis and modelling
Q.1.2. Oral and written Communication	**Q.2.2.** Strategic marketing	**Q.3.2.** Improvement of the organizational processes
Q.1.3. Intercultural communication	**Q.2.3.** Establishment of partnerships and alliances	**Q.3.3.** Identification and evaluation of alternative outsourcing solutions
Q.1.4. Team work	**Q.2.4.** Content marketing	**Q.3.4.** Exploration of the opportunities created by technological evolutions
Q.1.5. Autonomy	**Q.2.5.** Customer Relationship Management (CRM)	**Q.3.5.** Comprehension and development of information requirements
Q.1.6. Adaptation to change	**Q.2.6.** Mobile Marketing	**Q.3.6.** Conception and management of business architectures
Q.1.7. Critical and analytical thinking		**Q.3.7.** Structuring, collecting and analysing data
Q.1.8. Problem resolution oriented		**Q.3.8.** High level web or mobile programming
Q.1.9. Analysis and decision capacity		**Q.3.9.** SEO, semantic marking, web of data, big data
		Q.3.10. Data and infrastructure security

commerce. This initial list of skills was divided into three groups, namely: soft skills, management skills, and information systems skills. Table 1 presents the list of skills initially defined.

With the aim of designing a course that corresponded as much as possible to the needs of the labour market and incorporating the expectations and concerns of potential employers and future students, the authors carried out 1) an inquiry, doing interviews to potential employers, and 2) a survey, applying a questionnaire to ISCAP final year students of some after working hours degrees, and to graduate students who are already in the labour market.

3.1 Interviews

An interview or an interview survey is a data collection process that can be structured, semi-structured or unstructured. In fact, the interview is the most common form of data collection in qualitative research (Myers, 2013). A semi-structured interview combines open and closed questions as a commitment between an organized script, and the freedom of the interviewee to express opinions or report practices that were not originally considered by the interviewer and that can enrich the interview. Aligned with this view, the script used on the interviews[4], in addition to having closed questions, also had open-ended questions to emphasize the issue of freedom in responses. The objective of the interviews was to validate the list of skills initially defined (see Table 1). The interviews were recorded and later transcribed. The script of the semi-structured interview was applied to two companies. Interviewees were numbered as Interviewee 1 (I1) and Interviewee 2 (I2). On the first company (I1), it was applied to the CEO and on the second (I2) to the person in charge of the digital business channels and digital marketing. Both companies are Portuguese. The first one, where I1 was applied, operates in the area of luxury tourism, with activities related to wine and the wine culture, providing its customers with experiences in the vineyards. This company has seen an annual growth of over 20%/year in turnover for the last four years. This company does not have any physical shop, only operates on-line (B2C - e-tailor). The interviewee was the founder and CEO of the company. The second company, where I2 was applied, started in 1982 as a traditional photography business that later, with the advent of digital businesses, changed its business model to digital,

being today a multinational reference. This company holds a national leadership position in the digital printing and distribution of photographic material, an activity that still is its core business today, despite the diversification of its business to areas such as distribution and retail. This company operates now on several cities in Portugal, Spain and Brazil. Today it employs professionals in the field of digital marketing, electronic business, computer science among other areas of information and communication technologies. The interviewee has a background of digital marketing and the person in charge of the digital business channels and digital marketing.

The authors used content analysis techniques following two steps: 1) in order to capture the general meaning of the speeches a careful reading of all the interviews was performed; 2) the answers were grouped by each identified dimensions of analysis. In the analysis of the qualitative data collected with the interviews, two dimensions of analysis were identified, namely: i) **Dimension 1**: Pertinency of the master's degree in e-business; ii) **Dimension 2**: Skills considered as relevant for the master's degree in e-business.

3.2 Questionnaire

The next step on the process was the development of a questionnaire [5] to be applied to the students attending the last year of undergraduate after working hours programs that were considered as potentially interested in this new master program. These students have already professional experience in related fields, so they can provide relevant feedback about the skills necessary for a master's degree in e-business. Questionnaires that are completed by respondents themselves are one of the main instruments for gathering data using a social survey design (Bryman, 2012)

Likert scales were defined for each of the skills presented in Table 1, also considering the three different groups. Students were asked to express the level of importance they attribute to each of the skills presented from "1 = not at all important" to "5- very much important". Students' characterization was achieved through three questions, namely, working student (y/n), undergraduate (y/n), and age (20-30; 31-40; 41-50, more than 50). Students were also asked to optionally present some additional comments.

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[4] The script is available at:
  https://doi.org/10.5281/zenodo.2817576

[5] The questionnaire is available at:
  https://doi.org/10.5281/zenodo.2816903

47 students answered the questionnaire[6].

The data analysis for these questionnaires was generated using the add-in for MsExcel[TM] Real Statistics Resource Pack software (Release 5.4)[7]. Basic statistics were calculated, namely the median, the mean and the standard deviation for each question. The skills were ordered by median and then by mean. The Kruskal-Wallis H test (sometimes also called the "one-way ANOVA on ranks") was applied This test is a rank-based nonparametric test that can be used to determine if there are statistically significant differences between two or more groups of an independent variable on a continuous or ordinal dependent variable. This test was preferred to One-Way ANOVA since, "only nonparametric statistics should be used on Likert scale data" (Jamieson, 2004). The Kruskal-Wallis H test allows the comparison of two or more independent samples considering the medians of the samples (Guimarães & Cabral, 2007). Considering med_i as the median of sample i, we define H_0 and H_1:

H_0: $med_1 = med_2 = \ldots = med_i$ and H_1: $\exists_{i,j}$: $med_i \neq med_j$

We test H_0 against H_1. If H_0 is rejected, we can conclude that there is at least one pair of samples for which there are statistically significant differences. We then must apply a post-hoc test to find out which are the pairs of samples that present statistically significant differences. In this case we applied the Pairwise Mann-Whitney tests (Guimarães & Cabral, 2007).

4 RESULTS

This section presents the results of the research.

4.1 Interviews

Next paragraphs present the results obtained for each of the two dimensions of analysis:

Dimension 1: Pertinency of the Master's Degree in e-Business.

Both the interviewees consider that there exists pertinency for the creation of this master's degree in e-business. We emphasize the statement made by I2 "Nowadays e-business is an area that becomes very important, and this is a logical step that most of the companies will made" (I2). In addition, I1 mentions that "every week I do regular interviews to understand how the market is, and I am able to

understand that this is a recent area in Portugal and that there is the necessity of qualified professionals in an area that is steadily growing around the world". Following this idea, it is clear that both the interviewees emphasized that there are not enough professionals in this area: "there is a difficulty in finding qualified professionals to embrace projects with these characteristics" (I1); "we do not encounter too many people specialized in the area" (I2).

In addition, the interviewees, I1 and I2, consider that it is important that a master's degree such as the one in e-business is born in a prestigious school that is also a leader in its action areas.

Dimension 2: Skills Considered as Relevant for the Master's Degree in e-Business.

Both the interviewees identified several skills as being important to professionals in this area, thus relevant to be included in the context of the master's degree in e-business. I1 referred that it is important to have technological skills as well as management skills. Then both presented some more specific skills. For the sake of the analysis, the authors considered useful to group the skills they identified. The skills were grouped in the same three groups already referred above. The skills referred by both of the interviewees are listed (in alphabetical order) according to the considered groups:

Soft Skills: i) Autonomy (I2); ii) Communication skills (I1) (I2); iii) Ease of communication in foreign languages (I2); iv) Research skills (I1); v) Teamworking skills (I1) (I2).

Management Skills: i) Ability to design e-business as new business channels in traditional companies (I1) (I2); ii) Digital marketing skills (I1) (I2); iii) Logistics (I1); iv) Project Management (I1) (I2)

Information Systems Skills: i) Ability to create online content and make it available through several channels ((I1) (I2); ii) Analytical, data representation and SEO capabilities (I1) (I2); iii) Autonomy in the handling of technological tools to support the business (I1) (I2); iv) Improvement of the organizational processes (I1)

4.2 Questionnaire

There were 46 valid answers to the questionnaire in the group of questions on soft skills, 45 in the group of questions on management skills, and 44 in the group of questions in information systems skills.

The Cronbach's coefficient alpha was calculated for the three groups of skills´in order to test the internal consistency (Maroco, 2013). The obtained

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[6] The dataset is available at:
https://doi.org/10.5281/zenodo.2816903

[7] Copyright (2013 – 2018) Charles Zaiontz.
http://www.real-statistics.com – accessed in 28.04.2019

values of Cronbach's coefficient alpha of 0.577, 0.705, and 0.791, respectively, were consided adequate (Peterson, 1994).

23 of the respondents were afterworking hours students, 20 were not afterworking hours students, and the other ones did not give an answer. 33 of the respondents were undergraduate students, 11 were not undergraduate students, and the other ones did not give an answer. As for the age, 37 of the respondents have between 20 and 30 years, 6 have more than 30 years, and the other ones do not answer.

Table 2 presents the summary of results for the group of questions on soft skills, Table 3 on management skills, and Table 4 on information systems skills.

4.2.1 Soft Skills

The most relevant competences are: adaptation to change, ability to analyse and decide, and critical thinking. These do not present statistically significant differences between them. Adaptation to change presents statistically significant differences with all other items.

The least relevant competences are: leadership and intercultural communication. There are no statistically significant differences between these two. Leadership presents statistically significant differences for all, except for intercultural communication. All the more relevant competences present statistically significant differences with the three less relevant.

In any case, all skills present medians (2nd quartile) of 4 or 5 and averages higher than 3.76, so they can be all considered important. Statistically significant differences were not found out between: i) Group of working students and non-working students; ii) Group of graduate students and non-graduate students; iii) Group of students' ages between 20 and 30 years and group of students' ages great than 30.

4.2.2 Management Skills

Only the less relevant skill "Establishment of partnerships and alliances" presents statistically significant differences with all others. The remainder competences do not present statistically significant differences.

The two more relevant silks have medians (2nd quartile) 5, namely, Comprehensive view of the

Table 2: Summary of the results of the answers to the questionnaires for the Soft Skills.

	Q1.1	Q1.2	Q1.3	Q1.4	Q1.5	Q1.6	Q1.7	Q1.8	Q1.9
Q1.1. (Med$_{1.1}$ = 4); ($\bar{x}_{1.1}$ = 3.76); ($\sigma_{1.1}$ = 0.121)	---	yes p≈0.003	no	yes p≈0.019	yes p≈0.000	yes p≈0.000	yes p≈0.000	yes p≈0.001	yes p≈0.000
Q1.2. (Med$_{1.2}$ = 4); ($\bar{x}_{1.2}$ = 4.28); ($\sigma_{1.2}$ = 0.119)	---	---	no	no	no	yes p≈0.008	no	no	no
Q1.3. (Med$_{1.3}$ = 4); ($\bar{x}_{1.3}$ = 4.07); ($\sigma_{1.3}$ = 0.126)	---	---	---	no	no	yes p≈0.000	yes p≈0.005	no	yes p≈0.001
Q1.4. (Med$_{1.4}$ = 4); ($\bar{x}_{1.4}$ = 4.15); ($\sigma_{1.4}$ = 0.124)	---	---	---	---	no	yes p≈0.001	yes p≈0.033	no	yes p≈0.007
Q1.5. (Med$_{1.5}$= 4.5); ($\bar{x}_{1.5}$ = 4.35); ($\sigma_{1.5}$ = 0.121)	---	---	---	---	---	yes p≈0.019	no	no	no
Q1.6. (Med$_{1.6}$ = 5); ($\bar{x}_{1.6}$ = 4.65); ($\sigma_{1.6}$ = 0.104)	---	---	---	---	---	---	no	yes p≈0.004	no
Q1.7. (Med$_{1.7}$ = 5); ($\bar{x}_{1.7}$ = 4.52); ($\sigma_{1.7}$ = 0.086)	---	---	---	---	---	---	---	no	no
Q1.8. (Med$_{1.8}$ = 4); ($\bar{x}_{1.8}$ = 4.30); ($\sigma_{1.8}$ = 0.107)	---	---	---	---	---	---	---	---	yes p≈0.035
Q1.9. (Med$_{1.9}$ = 5); ($\bar{x}_{1.9}$ = 4.59); ($\sigma_{1.9}$ = 0.096)	---	---	---	---	---	---	---	---	---

Table 3: Summary of the results of the answers to the questionnaires for the Management Skills.

	Q2.1	Q2.2	Q2.3	Q2.4	Q2.5	Q2.6
Q2.1 (Med$_{2.1}$ = 5); ($\bar{x}_{2.1}$ = 4.49); ($\sigma_{2.1}$ = 0.099)	---	no	yes p≈0.000	no	no	no
Q2.2 (Med$_{2.2}$ = 4); ($\bar{x}_{2.2}$ = 4.31); ($\sigma_{2.2}$= 0.118)	---	---	yes p≈0.006	no	no	no
Q2.3 (Med$_{2.3}$ = 4); ($\bar{x}_{2.3}$ = 3.08); ($\sigma_{2.3}$= 0.144)	---	---	---	Yes p≈0.020	Yes p≈0.029	yes p≈0.005
Q2.4 (Med$_{2.4}$ = 4); ($\bar{x}_{2.4}$ = 4.27); ($\sigma_{2.4}$ = 0.102)	---	---	---	---	no	no
Q2.5 ((Med$_{2.5}$ = 4); ($\bar{x}_{2.5}$ = 4.22); ($\sigma_{2.5}$ = 0.127)	---	---	---	---	---	no
Q2.6 (Med$_{2.6}$ = 5); ($\bar{x}_{2.6}$ = 4.33); ($\sigma_{2.6}$ = 0.127)	---	---	---	---	---	---

business, and mobile marketing. Nevertheless, as in the previous topic all are considered important.

Statistically significant differences were not found out between: i) Group of working students and non-working students; ii) Group of graduate students and non-graduate students; iii) Group of students' ages between 20 and 30 years and group of students' ages great than 30.

4.2.3 Information Systems Skills

There are no skills that present statistically significant differences in relation to all the other ones.

There are 5 less relevant skills that do not present statistically significant differences between them, they are: Conception and management of business architectures, Improvement of organizational processes, identification and evaluation of solutions and alternatives of outsourcing, business analysis and modelling, understanding and development of information requirements. All these 5 skills have median (2nd quartile) 4.

There are 5 most relevant competences that do not present statistically significant differences between them, they are: Structuring, collecting and analysing data; high-level programming (web and mobile); SEO, semantic mark-up, web of data and big data; Exploration of opportunities created by technological innovations; data and infrastructures security. Only the last two have median (2nd quartile) 5.

Statistically significant differences were not found out between: i) Group of working students and non-working students; ii) Group of graduate students and non-graduate students; iii) Group of students' ages between 20 and 30 years and group of students' ages great than 30.

4.2.4 Open-ended Question

As mentioned above, the application of questionnaires to finalist students aimed to evaluate the sensitivity of respondents to the importance of electronic business, as well as to evaluate how they evaluated a set of parameters that based on experience and literature were considered relevant. In addition, they were asked an open question in order to obtain other approaches, other proposals for new skills or other program contents that had not been duly identified until then. Most respondents valued the proposal for a new e-business course, even those who did not consider joining it.

From the analysis to the content of the open answers, some key ideas were identified, such as: i) Innovation and the anticipation of ISCAP in offering pioneering courses; ii) The involvement of students and employers in the course design; iii) The prospect of high employability; iv) The convenience of the course being implemented in a school of business and not in a school of engineering; v) The importance of introducing tax and legal content; vi) The importance of introducing concepts of artificial intelligence, virtual reality and business intelligence.

5 DISCUSSION

The design of the master program followed the European and Portuguese regulations as well as the ones of the Polytechnic of Porto. The master program follows the traditional standards with a duration of 2 years, divided in 4 semesters, with 120 ECTS (European Credit Transfer and Accumulation System). Students in the last year can develop a Dissertation, a Project or a Curriculum Internship.

Table 4: Summary of the results of the answers to the questionnaires for the Information Systems Skills.

	Q3.1	Q3.2	Q3.3	Q3.4	Q3.5	Q3.6	Q3.7	Q3.8	Q3.9	Q3.10
Q3.1 $(Med_{3.1} = 4)$; $(\bar{x}_{3.1} = 4.09)$; $(\sigma_{3.1} = 0.130)$	---	no	no	yes p≈0.044	no	no	no	no	yes p≈0.034	yes p≈0.047
Q3.2 $(Med_{3.2} = 4)$; $(\bar{x}_{3.2} = 3.86)$; $(\sigma_{3.2}= 0.136)$	---	---	no	yes p≈0.001	no		yes p≈0.020	yes p≈0.010	yes p≈0.001	yes p≈0.006
Q3.3 $(Med_{3.3} = 4)$; $(\bar{x}_{3.3} = 3.93)$; $(\sigma_{3.3} = 0.143)$	---	---	---	yes p≈0.006	no	no	no	yes p≈0.037	yes p≈0.005	yes p≈0.006
Q3.4 $(Med_{3.4} = 5)$; $(\bar{x}_{3.4} = 4.45)$; $(\sigma_{3.4} = 0.100)$	---	---	---	---	yes p≈0.035	yes p≈0.000	no	no	no	no
Q3.5 $((Med_{3.5} = 4)$; $(\bar{x}_{3.5} = 4.09)$; $(\sigma_{3.5}= 0.129)$	---	---	---	---	---	no	no	no	yes p≈0.026	yes p≈0.038
Q3.6 $(Med_{3.6} = 4)$; $(\bar{x}_{3.6} = 3.77)$; $(\sigma_{3.6} = 0.129)$	---	---	---	---	---	---	yes p≈0.003	yes p≈0.001	yes p≈0.000	yes p≈0.000
Q3.7 $(Med_{3.7} = 4)$; $(\bar{x}_{3.7} = 4.30)$; $(\sigma_{3.7} = 0.101)$	---	---	---	---	---	---	---	no	no	no
Q3.8 $(Med_{3.8} = 4.5)$; $(\bar{x}_{3.8} = 4.30)$; $(\sigma_{3.8} = 0.136)$	---	---	---	---	---	---	---	---	no	no
Q3.9 $(Med_{3.9} = 5)$; $(\bar{x}_{3.9} = 4.43)$; $(\sigma_{3.9} = 0.123)$	---	---	---	---	---	---	---	---	---	no
Q3.10 $(Med_{3.10} = 5)$; $(\bar{x}_{3.10} = 4.45)$; $(\sigma_{3.10} = 0.095)$	---	---	---	---	---	---	---	---	---	---

Following the results obtained for the different necessary skills, the courses that composed the program were all defined with 6 ECTS:

1st Semester - i) Introduction to e-commerce; ii) Web Content Creation; iii) Innovation in e-commerce and Lean start-up; iv) Information systems for e-business; v) Introduction to web programming.

2nd Semester - i) Law in the context of e-business; ii) Research methodologies and scientific communication; iii) Logistics in the context of e-business; iv) Web Content Management Systems and E-Commerce; v) Seminars.

3rd Semester - i) Online advertising; ii) E-business project management.

3rd and 4th Semester - i) Dissertation / Project / Internship.

Tables 5, 6 and 7 present the relation between the soft skills previously presented and these courses. We verify that all the skills were taken into consideration in the several courses. We emphasize that all the most relevant skills identified in this study were strongly taken into consideration in the Seminars, in order to strengthen its visibility to the students. The course "Introduction to E-Commerce", deals with the contents related to business models in the digital world. The course "Web Content Creation" aims at boosting success in e-business, by efficient using of language and multimodality. It develops planning, writing, edition and proofreading strategies and techniques to optimize digital communication effectiveness in a business environment (e.g. content visibility, accessibility and interactivity). The course "Innovation in E-Commerce and Lean Start-up" aims at providing to students skills on entrepreneurship and innovation on new business' creation. The course "Information Systems for E-Business" was conceived, incorporating concepts of information systems and security concerns on e-business. The course "Introduction to web programming" provides basic skills in Web programming: HTML, CSS and PHP. The course "Law in the context of e-business" provides learning in legal and fiscal issues related to

e-business. The course "Research Methodologies and Scientific Communication" provides a context for discussion and learning on the importance of study and research, developing knowledge about several research methodologies, qualitative and quantitative, on techniques to develop research and provides insights on how to develop scientific writing. All students are invited to publish the results of their research. The course "Logistics in the context of e-business" provides learning on the entire value chain of products or services since e-business is characterized by having different logistic components than the ones of the traditional business. The course "Web Content Management Systems and E-Commerce" provides learning in content management systems (CMS), teaching students on how to select, install a server, configure and exploit the CMS, as well as on the identification of requirements for websites in general and e-tailor types of shops in particular, and on how to express requirements using specific techniques such as UML (Unified Modelling Language) (Rumbaugh, Jacobson and Booch, 2004) or BPMN[8] (Business Process Model and Notation) (White, 2004) (Dijkman, Dumas and Ouyang, 2008). It also provides introductory learning on payment methods and security in the digital world. The course "Seminars" aims at the contact with the business world since it is impossible to treat all the topics in the classroom. This course brings professionals of the area of e-business presents a seminar on a specific topic. This course "Online Advertising" aims at the development appealing content, using the best digital marketing techniques. The course "E-business projects management" aims at the development of skills in project management in general and in the implementation of e-business solutions in particular.

6 CONCLUSION AND FUTURE WORK

This paper reports on the process of building a curriculum for the master's degree in e-business that has started in the academic year of 2018/19 in the Business School of the Polytechnic of Porto (ISCAP), Portugal. This school is a higher education organisation that has more than a hundred years old, and aims to diversify its educational offer, adapting it permanently to the changes of society, responding to the needs of the labour market of its region (North of Portugal - a NUTS III type of region). E-business is a paradigm of work that enhances the volume of business due to the advantages of the digital technology. This technology has the ability to turn

Table 5: Relation between skills and courses of the 1st Semester.

Skills	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.1	2.2	2.3	2.4	2.5	2.6	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	3.10
Introduction to e-commerce				x		x				x									x					x	
Web Content Creation		x	x		x		x																		
Innovation in e-commerce and Lean start-up	x			x	x					x	x								x					x	
Information systems for e-business				x		x			x					x	x					x	x	x			
Introduction to web programming								x											x				x		

Table 6: Relation between skills and courses for the 2nd Semester.

Skills	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.1	2.2	2.3	2.4	2.5	2.6	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	3.10
Law in the context of e-business						x	x																		x
Research methodologies and scientific communication		x							x																
Logistics in the context of e-business			x						x								x								
Web Content Management Systems and E-Commerce							x			x														x	
Seminars	x								x			x	x	x			x								x

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8 See http://www.bpmn.org/ - accessed in 13.05.2019

Table 7: Relation between skills and courses of the 3rd and 4th Semesters.

Skills	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.1	2.2	2.3	2.4	2.5	2.6	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	3.10
Online advertising		x											x	x	x										
E-business project management	x			x																x					
Dissertation / Project / Internship																									

any local business into a global and ubiquitous business, to emphasize customisation and personalisation experiences, and to provide working contexts where multiple business players interact at the same time.

This work started with the study of the state-of-the-art of such programs in the high education organisations of the European Union. From that study a group of important skills were identified. These skills were the starting point to the work that followed. The authors organised an inquiry, doing interviews to potential employers of the region were the school is implanted. The script that was built to serve as a basis to the semi-structured interviews held, incorporated questions on the important skills of the future graduate students in the master degree, as well as other questions concerning the importance of such a program for the labour market. These interviews validated the interest of the labour market in such a program and gave input for new skills that were added to the previous ones.

With the result of the interviews, the authors organised a survey, applying a questionnaire to ISCAP final year students of some after working hours degrees, and to graduate students who are already in the labour market. This questionnaire listed the skills identified in the previous phase. The results of the questionnaire were the basis to define the courses and the curricula of each course. All the skills were incorporated.

The e-business master course is currently being held at ISCAP. In order to validate this process of building curriculum for a master program we will set up a validating process with several dimensions: the demand of the course; the employability of the graduated students that followed the course; the evaluation of the master course by graduated students that followed the course, and; the results in terms of projects and research outputs (papers in conferences or journals). In order to do so we still need to wait for at least 5 years to have a good sample of graduated students (approximately 100, 20 per year).

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