Field Work: Designing a Professionalising Master's Degree in Honduras

J. Iñaki De la Peña, e-mail: jinaki.delapena@ehu.es
Senior Lecturer, Faculty on Business and Economics, University of the Basque Country/Euskal Herriko Unibertsitatea, Lehendakari Agirre Av., 83. 48.015 - Bilbao, Spain

Rodolfo Geovanny Vasquez Pineda, rodolfo.vasquez@unah.edu.hn
Senior Lecturer, Faculty of Economics, Administrative and Accounting Sciences, National Autonomous University of Honduras. Tegucigalpa. 19 836, Honduras

Eduardo Trigo Martínez, etrigom@uma.es
Associate Professor PhD, Faculty of Economics and Business Studies, University of Málaga, Plaza de El Ejido s/n, 29.013 - Málaga, Spain

Abstract

The Actuary is a professional risk manager who estimates the probability of occurrence of a future event. They value and design products to reduce their negative impact. Actuarial training is internationally regulated, leading to a consensus of required competencies and skills in professional practice.

It is a globally recognised profession that can be obtained through higher education or through professional qualifications awarded by actuarial organisations or by governments themselves. Its main activity focuses on social welfare, both public and private, as well as risk control of the financial and insurance system.

However, not all countries have sufficient infrastructure to offer programmes for the training of actuaries. This is the aim of this chapter: to establish the key to the success that has enabled the Universidad Nacional Autónoma de Honduras to design and implement the MSc. in Actuarial Science, which enables the professional qualification of Actuary.

The methodology used follows the regulations of the leading actuarial associations. At the national level, the regulations that define the actions to be taken by the graduate with this qualification are taken into account. These regulations define the minimum knowledge that the professional must have, its recognition, as well as the type of activity that can be carried out.

As a result, the perception of the main stakeholders in Honduras has been collected, highlighting the high perception of the quality of design, as well as a high demand for the first promotion of this professional university degree. However, mechanisms are needed to certify that the professional skills are those required by the previous institutions. This delimits the need to build a quality assurance system on the profile of the graduate on the part of Honduras' society.

This is an Author Accepted Manuscript version of the following chapter: J. Iñaki De la Peña, Rodolfo Geovanny Vasquez Pineda and Eduardo Trigo Martínez, Field Work: Designing a Professionalising Master's Degree in Honduras, published in Teaching Innovations in Economics. Towards a Sustainable World, edited by María del Carmen Valls Martínez, José–María Montero, 2024, Springer, reproduced with permission of Springer. The final authenticated version is available online at: https://doi.org/10.1007/978-3-031-72549-4_25

1. Introduction

The origin of the word actuary as a profession dates back to 1707 as the person responsible for a life insurance company -*Amicable Society for a Perpetual Assurance Office*- (Santolino, 2016). However, as an a profession it appears with James Dodson in 1756 calculating life insurance premiums. In 1762, Edward Rowe, one of his colleagues, worked at *The Equitable* in London and noted in its statutes that the responsible manager was called an actuary (Ogborn, 1956).

Nowadays, the studies leading to the profession are regulated by the professionals themselves (Kok and García, 2002), providing the guidelines for their international recognition. At the national level, in some countries there are specific activities conducted by actuaries, which are regulated by law (OECD, 2001). This fact confers a markedly professional character (Moreno et al., 2011) as well as underlining the importance of the profession within the country.

Access to the actuarial profession is diverse. Thus, in some countries (France, Belgium, Italy, Denmark, Sweden, Finland, Portugal, Spain, etc.) actuarial training is located in university education and becomes the main requirement for access to the actuarial profession. In other countries (the rest of Europe, the United States of America, Canada and Australia), the main requirement to become an actuary is to pass a set of examinations established by one or more professional organisations. However, part of these examinations may be validated by the degree or diploma corresponding to one of the university study programmes in Actuarial Science that have been previously identified as suitable for this purpose by the organisation itself (Santolino, 2016).

In addition to the chosen training system, however, it is necessary for the country itself to have a legal framework that will enable the internal development of the profession. The existence of basic and advanced legislation that demonstrates the importance of the actuarial profession in the country's development. In this field, the actuarial profession is the technical support for public and private social security, the solvency of financial and insurance companies, the valuation of claims, etc. However, not all countries have sufficient infrastructure and qualified teaching staff to offer programmes for the training of actuaries. Nor have they had a legislative development to support the development of the profession within the country (De la Peña and Iturricastillo, 2010).

The university is the country's driving force behind the educational value of the profession and is therefore socially and professionally responsible for ensuring that university graduates obtain the professional background . Precisely, this professionalism is defined by the professional skills defined by international reference institutions, and national ones if there are any. These bodies are responsible for ensuring that these Master's degrees are both professional and relevant. To guarantee such professionalism, in addition to the specific contents, teaching tools are applied such as

This is an Author Accepted Manuscript version of the following chapter: J. Iñaki De la Peña, Rodolfo Geovanny Vasquez Pineda and Eduardo Trigo Martínez, Field Work: Designing a Professionalising Master's Degree in Honduras, published in Teaching Innovations in Economics. Towards a Sustainable World, edited by María del Carmen Valls Martínez, José–María Montero, 2024, Springer, reproduced with permission of Springer. The final authenticated version is available online at: https://doi.org/10.1007/978-3-031-72549-4_25

compulsory work experience, the role of mentors and the use of serious games (Popescu, et al. 2013; Arsuaga, et al. 2020), thereby ensuring that the university is closely aligned with society.

The aim of this chapter is to establish the key to success that has enabled the Universidad Nacional Autónoma de Honduras (UNAH) to design and implement a MSc. in Actuarial Science (MScAS) that provides the professional qualification required by actuaries. To this end, the main factors necessary for the development of the profession are identified, which makes it possible to define the actions to be carried out for implementation at the different levels of the country: university, administration and society.

This initiative contributes to sustainable development in Honduras and is aligned with Sustainable Development Goals (SDG): 4 (Quality Education); 8 (Decent Work and Economic Growth); 9 (Industry, Innovation, and Infrastructure); 10 (Reduced Inequalities); 16 (Peace, Justice and Strong Institutions) and 17 (Partnerships for Goals). Precisely, these goals are characterised by preparing the country's professionals for the development of the country through quality education.

The research is structured as follows. The second section indicates the methodology and data for analysing the competences to be developed in the degree programme. For this purpose, the Syllabus of the International Actuarial Association (IAA) is used and an analysis is made of the perception that the main interest groups in Honduras have of the actuarial profession. In the third section, the results of the application of the IAA Syllabus are obtained and the category of higher education in which the MScAS can be classified is identified. The results of the perception of the two main stakeholder groups are also obtained. The fourth section discusses the impact of the MScAS on Honduran society. Finally, the main conclusions of the chapter and the references used in it are presented.

2. Method and Data

A profession is regulated when it is necessary to hold a specific qualification, and/or to pass specific exams, and/or to belong to a professional association. Therefore, the design of a MScAS requires the following analysis (Arsuaga, De la Peña and Moreno, 2020):

i) Training programme enabling the professional activity.
ii) Regulation of the activity to be carried out by the professional in the country.

Training is complete when the functions that society demands of the professional are included in the training stage (Trigo et al, 2020). Therefore, in addition to the general needs required to practise the profession, it is necessary to take into account the idiosyncrasies of the country in which the profession is to be practised.

This is an Author Accepted Manuscript version of the following chapter: J. Iñaki De la Peña, Rodolfo Geovanny Vasquez Pineda and Eduardo Trigo Martínez, Field Work: Designing a Professionalising Master's Degree in Honduras, published in Teaching Innovations in Economics. Towards a Sustainable World, edited by María del Carmen Valls Martínez, José–María Montero, 2024, Springer, reproduced with permission of Springer. The final authenticated version is available online at: https://doi.org/10.1007/978-3-031-72549-4_25

In any case, worldwide access to the actuarial profession is through one of the following three systems:

i) Certification, subject to completion of one or more examinations set by professional associations or the government of the country.
ii) University degree.
iii) Mixed, as a combination of the two above.

Regardless of the system of access to the profession, professional associations must ensure a high level of compliance with the IAA Syllabus in order to become a full member of this supranational professional association.

2.1. The Actuarial Syllabus

The IAA was founded in 1895 to represent professional actuarial associations worldwide. It currently has 74 full members and 26 associate members and is the international body that ensures the recognition of the actuarial profession (IAA, 2024). Through various committees and forums, it periodically reviews and updates the Training Syllabus. This Syllabus is a document agreed by a supranational professional association and must be followed by local associations to ensure that their members have the necessary knowledge to practise the profession and that they have acquired the competencies and skills under minimum standards, which allows international recognition and the transfer of professionals between countries.

Under this recognition system, the national validators of the profession are the professional associations that are full members of the IAA. It is the country's own professionals who ensure the existence and enforceability of minimum contents that guarantee that the training programmes provide the competencies and skills necessary for the practice of the profession. In addition, these training programmes lead to recognition as a member in each country.

The IAA Syllabus (IAA, 2022) proposes a transversal training focused on the knowledge of tools to be able to apply them in each of the areas in which it is developed (see Table 1, column Areas). It is developed using Bloom's model of learning objectives (Heer, 2024). To achieve these objectives, the minimum level of knowledge is disaggregated into sub-areas (see Table 1, Sub-areas column), atomising it in depth. To describe it, a taxonomy is applied with which most of the competences (knowledge and skills) are usually developed in current university curricula (Garcia-Aretio, 2020; Arsuaga et al., 2022).

This is an Author Accepted Manuscript version of the following chapter: J. Iñaki De la Peña, Rodolfo Geovanny Vasquez Pineda and Eduardo Trigo Martínez, Field Work: Designing a Professionalising Master's Degree in Honduras, published in Teaching Innovations in Economics. Towards a Sustainable World, edited by María del Carmen Valls Martínez, José–María Montero, 2024, Springer, reproduced with permission of Springer. The final authenticated version is available online at: https://doi.org/10.1007/978-3-031-72549-4_25

Table 1: IAA Syllabus. Number of Areas and Sub-areas**.**

Areas	Number of Sub-areas	Number of Sub-subs
I. Statistics	6	25
II. Economy	3	31
III. Finance	4	24
IV. Financial system	4	12
V. Financial assets	4	18
VI. Data and systems	5	22
VII. Actuarial models	6	32
VIII. Actuarial risk management	5	23
IX. Personal Practice and Actuarial Profession	4	34
TOTAL	**41**	**221**

Source: IAA Syllabus (2022)

There is an extensive list of verbs that define the different activities (Newton, Da Silva and Peters, 2020), although in this work we follow the verbs listed in the syllabus itself (IAA, 2022). Thus, for each of the sub-sub-areas (see Table 1, Sub-subs column), we begin with an initial classification (Bloom et al, 1956) of: knowledge, comprehension, application, analysis, synthesis and evaluation (Garcia-Aretio, 1994). Subsequently, the degree of reformulation (Anderson et al, 2001) of the initial classification is specified, arriving at six degrees of deepening: remember -1-, understand -2-, apply -3-, analyse -4-, evaluate -5- and create -6-.

This learning model initially indicates the type of conceptual development the student should acquire in each of the subjects/sub-sub-subjects, distinguishing the following four categories of knowledge:

A. Factual knowledge generally involves terminology associated with actuarial work and specific details with respect to financial security systems, actuarial models, actuarial methods and the external forces important to actuarial work. The development of the competence is basic, although the student has the minimum knowledge of the subject.
B. Conceptual knowledge. The development of competence is deeper than in informal knowledge and the student masters the theoretical framework and the technical and scientific foundations. Generally involves the interrelationships among current or potential future financial security systems, common actuarial models, common actuarial methods, external forces and the actuary.
C. Procedural knowledge. The learner is able to apply knowledge in various scenarios by applying it and obtaining results in a systematic way. To demonstrate Procedural Knowledge often requires both Factual and Conceptual knowledge. Many practical skills require Procedural knowledge.
D. Metacognitive knowledge. The student acquires the theoretical and practical competences of the subject and is able to generate knowledge with them.

The degree of depth in each of the above knowledge can be measured on a scale of 1 to 6 on which the student is able to carry out the following activities autonomously:

1. Remembering and recognising what has been learnt (Remember).
2. Interpret, exemplify, classify, summarize, infer, compare, explain (Understand).
3. Apply, execute and implement subject knowledge, methods and models (Apply).
4. Analyse, as well as differentiate and organise elements, events and cases (Analyse).
5. Check, evaluate and criticise the development of the subject (Evaluate).
6. Create, generate, plan and produce new developments within the subject (Create).

Therefore, there is a natural order for cognitive processes from the lower order cognitive skills, 1) Remembering, 2) Understanding, 3) Applying, 4) Analysing, 5) Evaluating, to the higher cognitive order: 6) Creating. This order does not imply difficulty in cognitive process development, but rather that the lower cognitive process is assumed by a higher cognitive process.

Moreover, in addition to the areas, sub-areas and the type of conceptual development and degree of in-depth study suggested in the Syllabus, national actuarial institutions may request additional requirements from candidates. Logically, in addition to the generic training needs, the subjects and activities specific to the country must also be included. As the profession is going to be exercised within a specific legal, economic and labour framework, specific topics are therefore essential in order to situate the profession within the needs of the country. In this way, actuarial training is adapted to the reality of the country.

Finally, for the qualification of actuary, in general, the relevant exams or studies should allow at least a level 2 out of 4 to be achieved in each of the areas. However, national professional associations may ask for additional requirements from candidates. In the case of Honduras, there is no formally established national professional association of actuaries, so there are no additional requirements for professional actuaries in the country.

2.2. Demand in Honduras

One of the problems in Latin America is the lack of official studies leading to the training of actuaries. This situation is complicated by the fact that the regulations in some countries do not include specific functions and responsibilities for the actuarial profession. The result of both circumstances is that, although professional associations exist in these countries, they are not recognised by their international counterparts (De la Peña and Iturricastillo, 2010).

In order to gather the perception of actuarial studies in Honduras, an "ad hoc" questionnaire was carried out in the academic memory of the MScAS among the following Honduran groups: employers, international experts and students.

The first group (employers) consists of 60 observations and was asked about the learning objectives reflected in the Syllabus. Specifically on the importance (Very important, Important or Not very important) of the acquisition of knowledge and the development of competences and skills in the following areas for the practice of the profession:

1. ALM (Asset-Liability Management) and derivatives.
2. Solvency calculation and analysis.
3. Actuarial science.
4. Data science.
5. Accounting.
6. Product design, analysis and evaluation.
7. Ethics and professionalism.
8. Mathematics and statistics.
9. Capital measurement and management.
10. Financial and actuarial modelling.
11. Standards and regulation .
12. Planning and control.
13. Software.
14. Decision-making.

In conjunction with the questionnaire, survey respondents were also asked if they had employed actuaries and if they would be interested in employing an actuary. Eighteen of the respondents (30%) answered that they had an actuary employed, but 58 (96.6%) answered that they would employ an actuary if they could.

The second group (international experts) consists of nine observations and were asked about their perception of actuarial studies for Honduras and the learning objectives reflected in the Syllabus. These objectives are the same as those of the employers and have been presented above.

3. Results

3.1. Results from the Actuarial Syllabus

Each of the nine areas of the Syllabus is subdivided into sub-areas, indicating the type of conceptual development to be developed, as well as the degree of depth. Analysing the Syllabus in detail, the degree of demand of the training is obtained (Figure 1) through the frequencies of the degree of development (from 1 to 6) required for each knowledge development (from A to D) (Arsuaga, De la Peña and Moreno, 2020).

This is an Author Accepted Manuscript version of the following chapter: J. Iñaki De la Peña, Rodolfo Geovanny Vasquez Pineda and Eduardo Trigo Martínez, Field Work: Designing a Professionalising Master's Degree in Honduras, published in Teaching Innovations in Economics. Towards a Sustainable World, edited by María del Carmen Valls Martínez, José–María Montero, 2024, Springer, reproduced with permission of Springer. The final authenticated version is available online at: https://doi.org/10.1007/978-3-031-72549-4_25

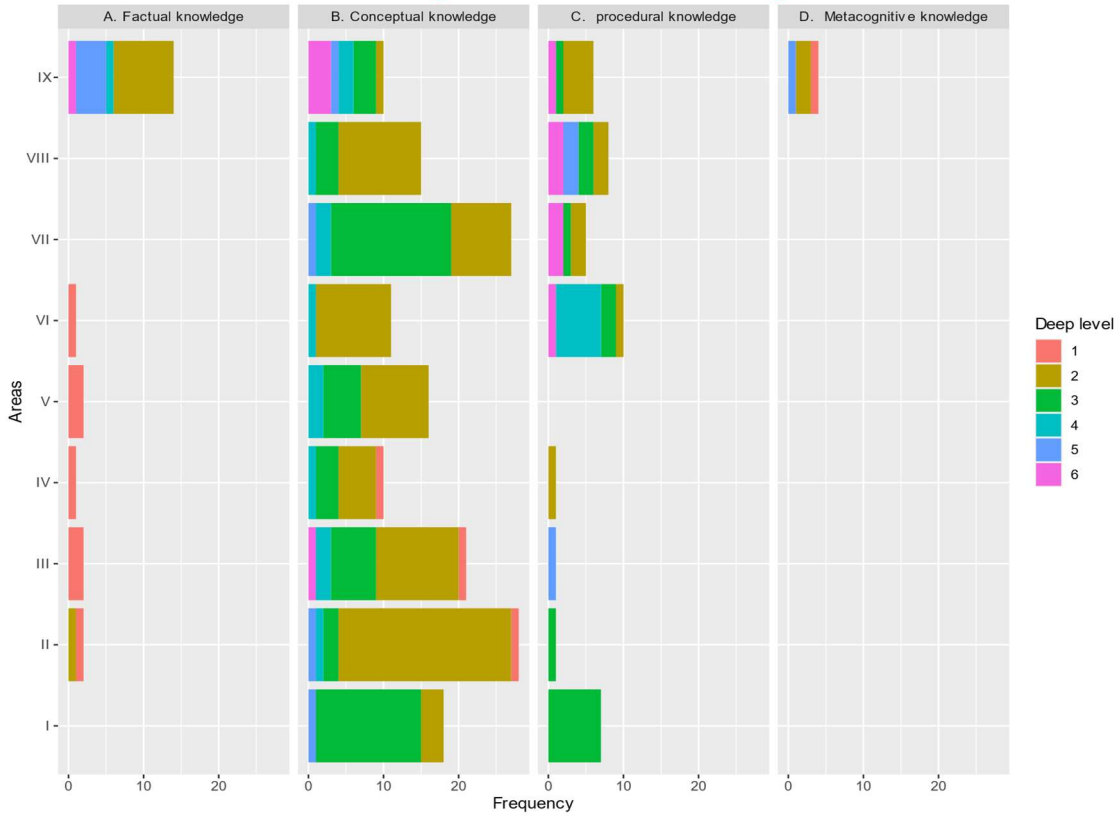

Figure 1. Frequencies of the degree of deepening (1/2).
Source: IAA (2022)

As can be observed in Figures 1 and 2, the Syllabus requires a deepening of the actuarial training in terms of knowledge. This is the reason why it is mainly placed, independiently of the conceptual development (A, B, C or D), mostly at levels 2 on Understanding (36%) and 3 (Application) (16%). Level 5 (Evaluate) focuses mainly on area IX of the Syllabus (Personal Practice and Actuarial Profession).

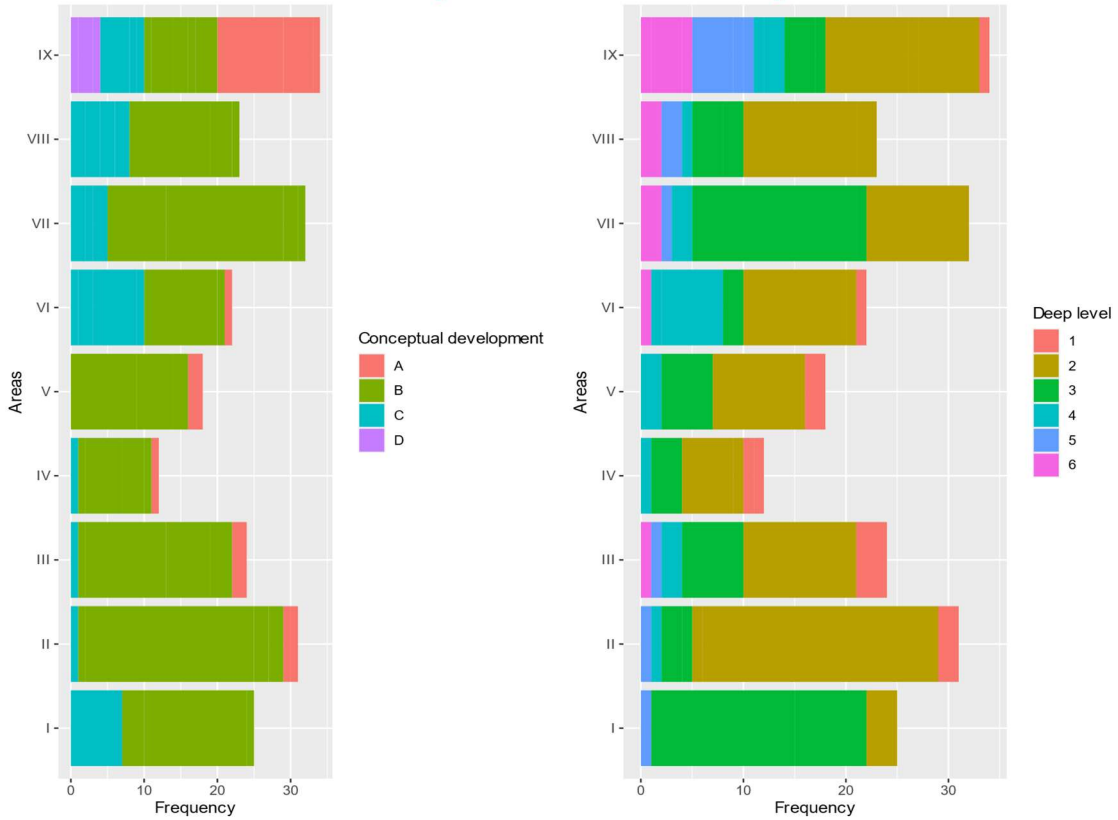

Figure 2. Frequencies of the degree of deepening (2/2).
Source: IAA (2022)

As for the type of conceptual development, the Syllabus requires this to be fundamentally conceptual (B) and procedural (C). Meta-knowledge (D) focuses on area IX, which requires both transversal knowledge of the rest of the areas and communication skills that allow the results of the profession to be transmitted to other professionals, whether actuaries or not.

The result of this analysis is that a practical vocationally oriented training with immediate insertion into the professional world is clearly pursued. This is refuted by analysing the most frequently occurring learning objectives (Figure 3). These correspond to conceptual knowledge (B), in particular to the degrees of deepening Understand (2) and Apply (3). They occur in 81 and 52 out of 221 topics, representing 36.6% and 23.5% of the items respectively.

This is an Author Accepted Manuscript version of the following chapter: J. Iñaki De la Peña, Rodolfo Geovanny Vasquez Pineda and Eduardo Trigo Martínez, Field Work: Designing a Professionalising Master's Degree in Honduras, published in Teaching Innovations in Economics. Towards a Sustainable World, edited by María del Carmen Valls Martínez, José–María Montero, 2024, Springer, reproduced with permission of Springer. The final authenticated version is available online at: https://doi.org/10.1007/978-3-031-72549-4_25

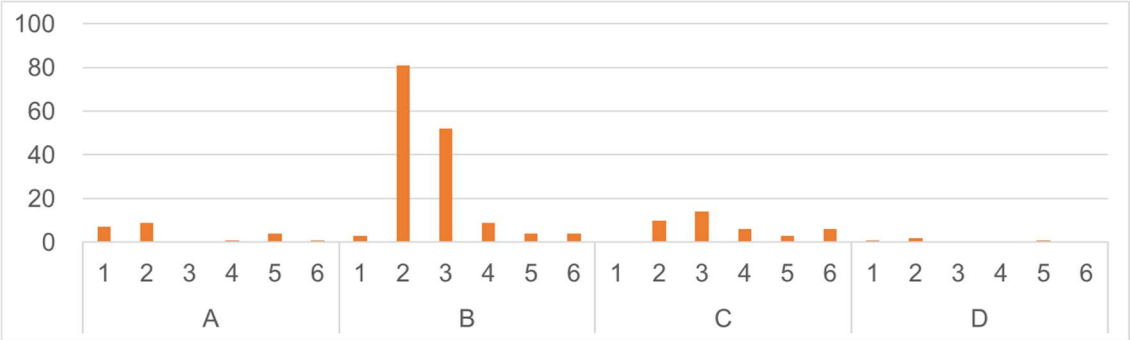

Figure 3. Frequencies of learning objectives
Source: IAA (2022)

Both characteristics are typical of an education in which the graduate must interpret reality and apply procedures, and this is a characteristic of the actuarial profession.

The analysis is completed with the determination of the predominant disciplines in the training of actuaries, which makes it possible to obtain the complete professional profile of the graduate. To this end, a progressive weighting is made of the degree of in-depth study for each of the nine subjects that make up the Syllabus. In this way, each of the four conceptual developments has six degrees of deepening, so that, in total, 24 progressive degrees of learning can be accumulated for each learning objective of each sub-subject. All of this can be included per area.

Finally, as a result of these aggregations for each of the nine areas or subjects of the Syllabus, we obtain (Figure 4) a weighting of the weight of each of them in the total training required in the Syllabus. This is a characteristic that actuarial studies in Honduras must comply with.

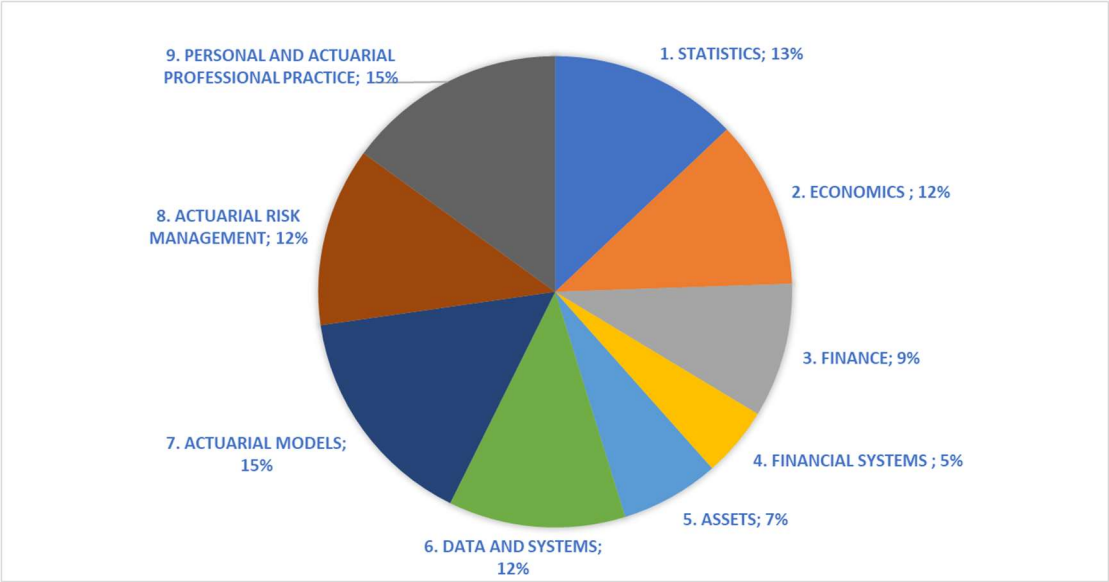

Figure 4. Weighting of the actuary's education and training by area
Source: Authors

It can be seen that actuarial training is concentrated in the following three categories:

1. 27% in Actuarial, consisting of Actuarial Risk Management (8) and Actuarial Modelling (7).
2. 21% in Finance, consisting of Finance (3), Financial System (4) and Assets (5).
3. 25% in Quantitative, consisting of Statistics (1) and Data and Systems (6).

3.2.Stakeholder perceptions in Honduras

The answers given by the first group surveyed, the employers, highlight the importance given to the knowledge of all the items included in the Syllabus. However, even though they are relevant competences and knowledge, Accounting (5) and Product design, analysis and evaluation (6) do not reach the level of very important. These are knowledge that the professional usually develops and has developed in the financial and insurance business.

It also highlights that the skills developed in the Syllabus, Mathematics and Statistics (8) and Capital measurement and management (9) are considered very important competences. In general, employers perceive that hiring professionals with these types of competences generates value for the company and, therefore, for the country. In any case, in all the cases raised in the questionnaire, the competences included in the Syllabus are considered to be of little importance.

The main results of employers' perception of the importance of skills and knowledge are illustrated in Figure 5.

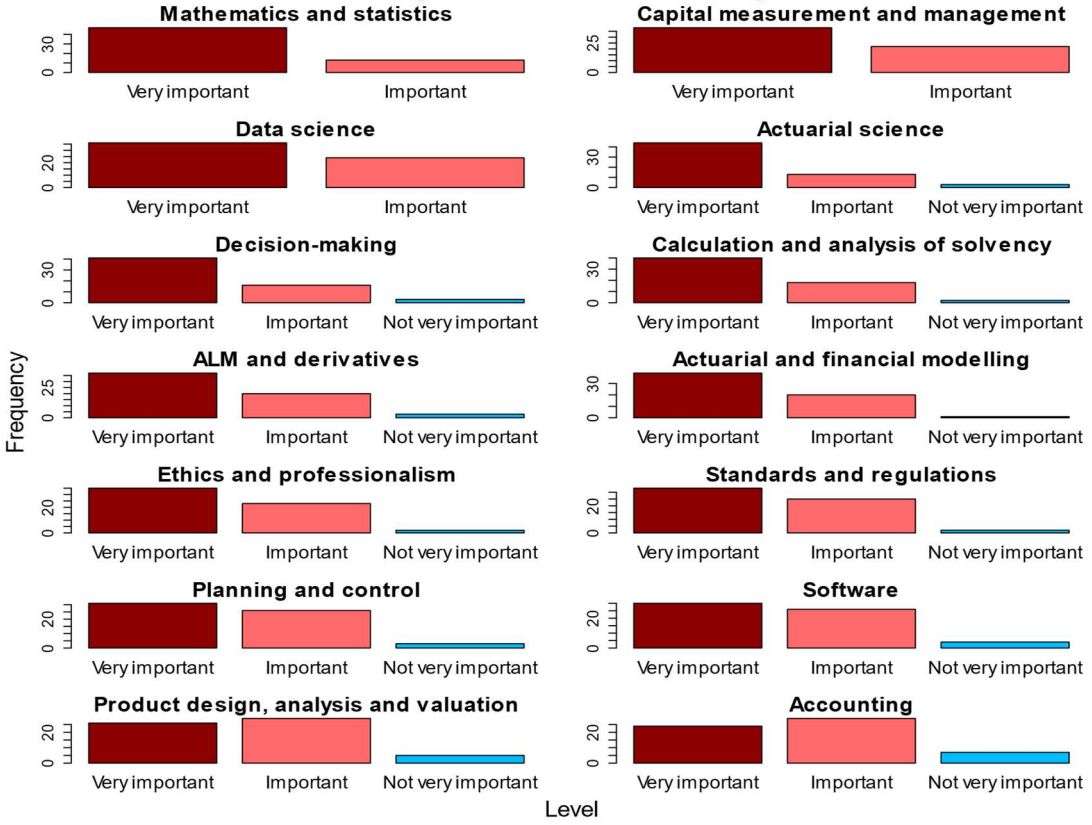

Figure 5. Employers' perception results
Source: Authors

The Figure 6 ilustrates the main results of the contrast of the perception of the importance of the competences and knowledge by the nine international experts. This Figure 6 shows that the international experts consider all the items of the Syllabus to be important although, within these, the importance of the competences and knowledge in ALM (Asset-Liability Management) and derivatives (1) and Product design, analysis and evaluation (6) is lower. These are skills that the professional usually develops and has developed in the financial and insurance business. It should also be noted that both employers and international experts agree in their perception of competence 6.

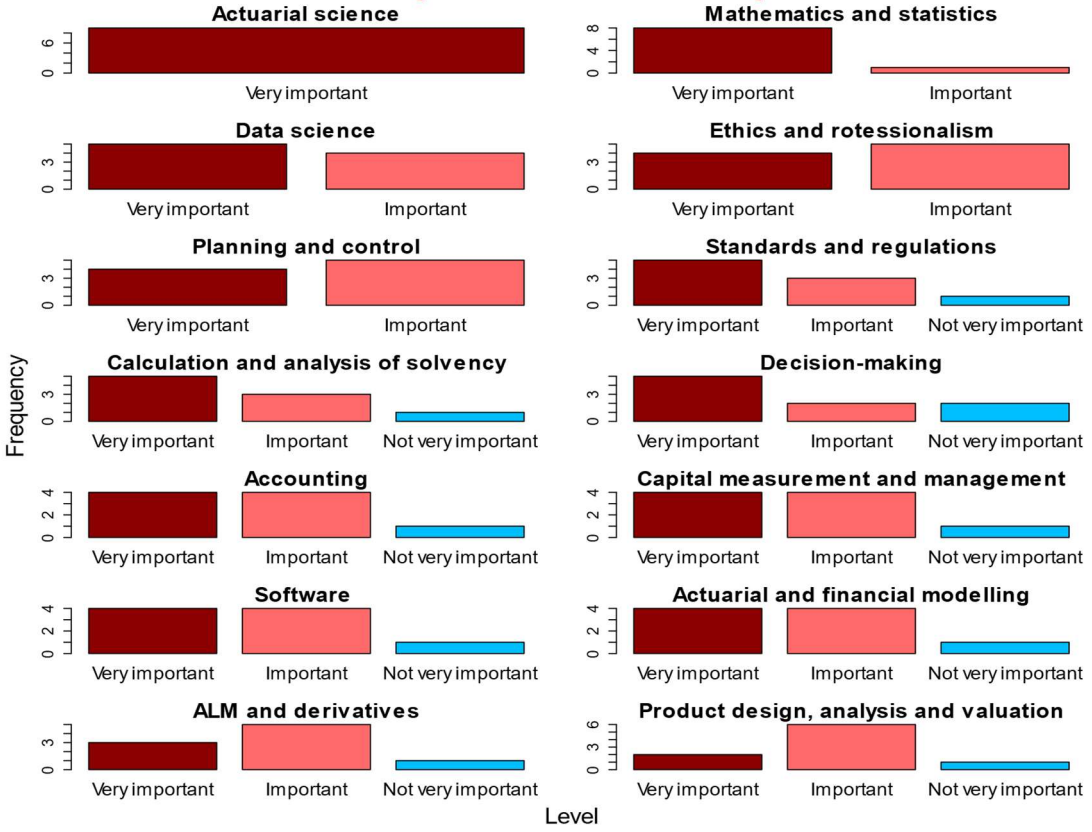

Figure 6. Expert perception results
Source: Authors

However, it stands out that the knowledge that the Syllabus develops on Actuarial science (3), Mathematics and statistics (8), Data science (4) and Ethics and professionalism (7) are considered very important competences. In all cases, the category "Not very important" has a residual importance.

Finally, the perception of potential students of the MScAS in Honduras was collected. For this purpose, 357 students with the socio-demographic characteristics indicated in Table 2 were surveyed:

Table 2: Profile of students seeking actuarial training in Honduras**.**

By Age			By marital status			Country and Gender		
From 20 to 25 years old	231	64.7%	Single	296	82.9%	Honduras	356	99.0%
26 to 30 years old	30	8.4%	Married	37	10.4%	Costa Rica	1	0.28%
31 to 36 years old	67	18.8%	Free union	22	6.2%	Woman	198	55.46%
Over 37 years old	29	8.1%	Widowed	2	0.6%	Man	159	44.54%

Source: Authors.

The youth of the candidates is notable, with a slightly higher percentage of women. Fifty-four percent of the candidates are only studying and 70.59% of the students surveyed consider these studies to be of high or very high interest. The typical student

corresponds to a Honduran person between 20 and 25 years of age and of single marital status.

Likewise, in order to identify the student's entry profile, students were asked about the computer skills and abilities they previously possessed and/or had obtained in their degrees and training prior to the Master's. Specifically, they were asked about their knowledge of the main office software and programming languages used in the Master's degree.

Regarding knowledge of office software, students were asked about their knowledge of a word processor (Word®), a spreadsheet (Excel®), a presentations (PowerPoint®) and a database manager (Access®). The results are shown in figure 7.

As for knowledge of programming languages, they were asked about their level of knowledge of R®, Python® or SQL®, the results of which are shown in figure 8.

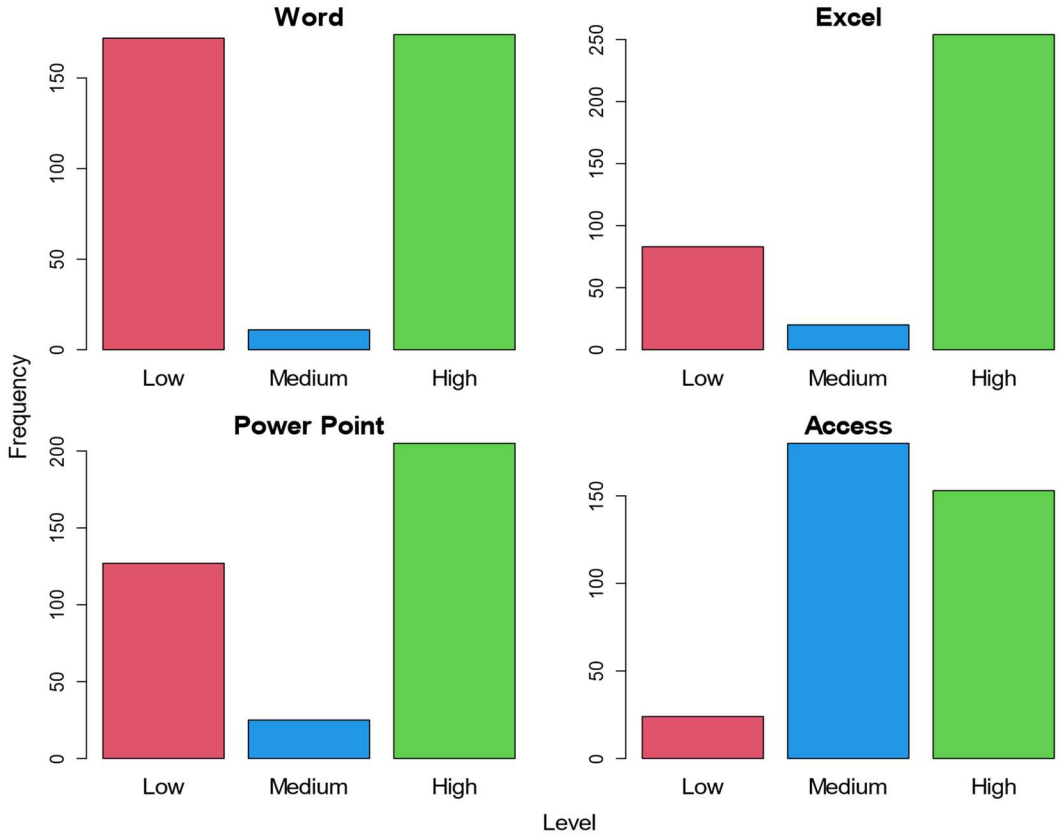

Figure 7. Students: Knowledge of office software
Source: Authors

Figure 7 and Figure 8 show that the average entry profile is: a student with a good IT background, who has a high level in the use of spreadsheets and database managers, and a medium level in the use of languages, both programming (Python® and/or R®) and database query (SQL®).

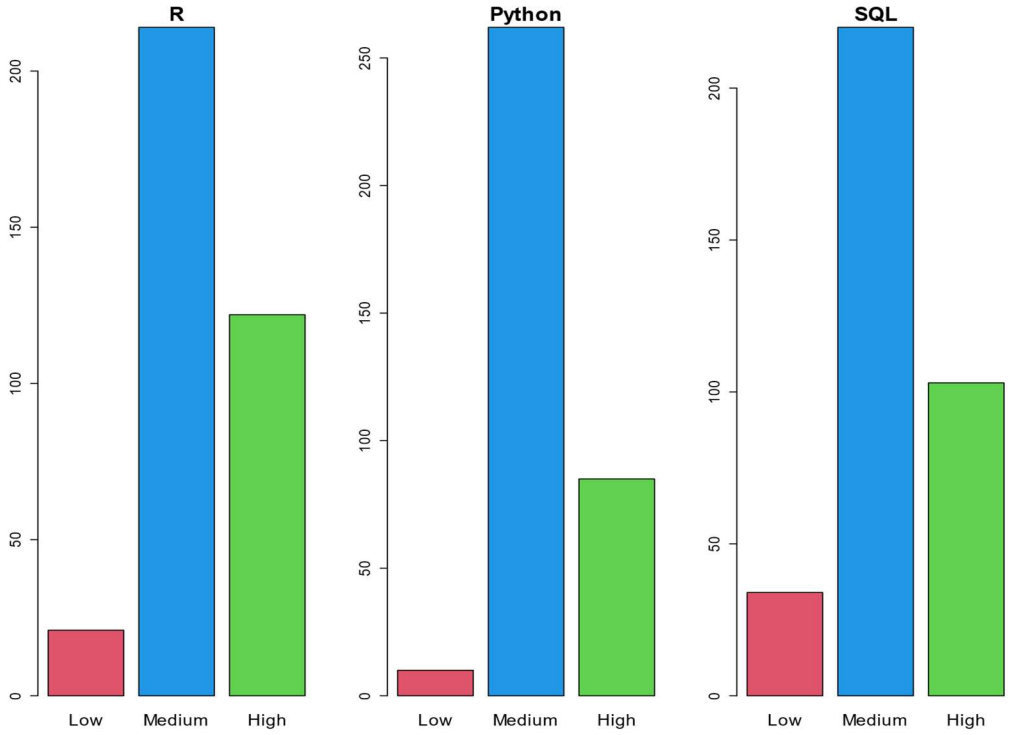

Figure 8. Students: Knowledge of programming languages
Source: Authors

4. Discussion: Next steps

The initial premise for the development of the curriculum is that it should follow the lines of the Syllabus indicated above, both in terms of composition and degree of development. In accordance with the above, a syllabus of 23 subjects (3 of which are propaedeutic) is achieved, distributed over 5 academic periods (Table 3). This distribution allows the progressive acquisition of the competences and learning objectives expected for the professional actuary.

Table 3: Curriculum. Universidad Nacional Autónoma de Honduras**.**

Number.	Code	Name of the subject
		Propaedeutic Course
1	PCAF-01	Mathematics applied to actuarial science
2	PCAF-02	Economy
3	PCAF-03	Programming applied to actuarial science
		First Academic Period
1	CAF0101	Mathematics applied to actuarial science
2	CAF0102	Computer tools applied to actuarial science
3	CAF0103	Actuarial Statistics
4	CAF0104	Economy
		Second Academic Period
5	CAF0105	Survival Models
6	CAF0106	Insurance and Pension Legal Regime
7	CAF0107	Life Insurance
8	CAF0108	Research methodology
		Third Academic Period
9	CAF0109	Social Security I
10	CAF0110	Dynamic Financial Analysis I
11	CAF0111	Non-Life Insurance
12	CAF0112	Investment Portfolio I
		Fourth Academic Period
13	CAF0113	Actuarial ethics and professionalism
14	CAF0114	Dynamic Financial Analysis II
15	CAF0115	Social Security II
16	CAF0116	Applied Research Work I
		Fifth Academic Period
17	CAF0117	Investment Portfolio II
18	CAF0118	Accounting for Insurance
19	CAF0119	Risk Management and Measurement
20	CAF0120	Applied Research Work II

Source: Authors

Taking into account that the profile of the professional actuary entails a global accumulation of training in an advanced studies programme (Master), the set made up by the Syllabus and the needs derived from the regulation, the design of the training can be distributed in three main parts:

1. Educational prerequisites. These determine the entry profile for the MScAS. Students must have acquired these competences and skills in their undergraduate studies. If this is not the case, they must acquire them by taking the corresponding training complements.
2. Basic actuarial education. It forms the core of competences and skills that students should acquire in the MScAS, which have been agreed internationally. It is structured into the nine learning areas set out in Table 1.

3. Advanced skills and competences derived from national regulation. This is made up of the national guidelines that the professional activity in Honduras must have. These are the responsibilities that the Supervisor will grant to professionals within the country's economy and, where appropriate, determines the profession's activity reserves.

The implementation of this curriculum identifies the strengths and, where appropriate, the structural deficiencies for the development of the Master's degree in Honduras, in terms of the suitability of the teaching staff and the teaching guides for the development of the learning objectives. This requires concrete actions:

i) The teaching staff is made up of experts in the actuarial or teaching fields, or both, from Honduras, who can be found either in the Administration or practising in the private sector. In those subjects for which the country does not have experts, the UNAH has established agreements with external teaching staff, which guarantees the acquisition of the learning objectives set out in the syllabus by the graduates.
Regardless of their background, teachers should refer to the curricula of supranational professional associations and national regulations in order to ensure that learning objectives are met.

ii) The Teaching Guides contemplate both the academic development of the student and the professional aspect. In addition to the contents included in the Syllabus, a wide variety of activities are contemplated, which have been designed to emphasise professionalism (Fernández-Morales and Trigo-Martínez, 2015; Fernández-Morales et al., 2015; Fernández-Morales et al., 2019).

iii) Special emphasis is placed on collaborative learning, which is used as a tool for students to acquire the knowledge and skills necessary for them to be able to work in groups made up of professionals from the same or different professions in the future. This is a necessary skill into interdisciplinary professions such as actuarial work (Trigo-Martínez and Fernández-Morales, 2017).

A university degree of a markedly professional nature must be designed taking into account the above points and, in addition, be integrated into a quality assurance system. The ultimate aim is to guarantee the professional profile of MScAS. That is, to accredit that graduates acquire the professional competences and that these are those required by the above mentioned organisations:

- Teaching and research staff, whether or not from the university itself, and external professional collaborators who train in professional competences.
- Internships with other professionals who instruct them in the practice of the profession.

This is an Author Accepted Manuscript version of the following chapter: J. Iñaki De la Peña, Rodolfo Geovanny Vasquez Pineda and Eduardo Trigo Martínez, Field Work: Designing a Professionalising Master's Degree in Honduras, published in Teaching Innovations in Economics. Towards a Sustainable World, edited by María del Carmen Valls Martínez, José–María Montero, 2024, Springer, reproduced with permission of Springer. The final authenticated version is available online at: https://doi.org/10.1007/978-3-031-72549-4_25

- Instruments that provide evidence of the degree of acquisition of the professional competences developed by students in their internships, whether compulsory or not, as well as in the Master's Thesis.

This achieves compliance with the Syllabus and insertion. However, the cycle for actuarial professionals to be integrated into the society, generating added value and being internationally recognised requires additional elements, in the design of the MScAS of the UNAH:

1. To detect, analyse and promote the need for actuaries as professionals prepared to structure the financial system in its different aspects (finance, pensions and insurance, both public and private), providing it with technical and scientific rigour.
2. Adapt the proposed system to the reality of the country. It implies reaching agreements with public authorities, academics and companies in the financial, insurance and pension sectors.
3. Implement the curriculum using the Inter-University Agreements for Collaboration and Teacher Training.
4. Take the necessary steps to establish the Professional Association and enact the regulations governing the profession. These regulations should include the Statutes, the Code of Conduct and the Rules of Practice, which should be adapted to the reality of the country.
5. Inform the IAA of the creation of the MScAS and of the constitution of the National Professional Association of Actuaries and, when deemed appropriate, apply for membership of that association, first as an associate member and then as a full member. These formalities must be carried out by means of the official documents and forms, which will be reported as established in the proposed system and in the adaptations made.
6. Monitoring the educational process and proposing appropriate improvements at the end of each academic year. Analysing the suitability of the studies carried out and beginning to register actuaries.

This is a continuous quality management process that leads to the empowerment of the country in general and the financial and insurance sector in particular.

5. Conclusion

Following the analysis of the Syllabus and the training needs derived from the self-analysis of employers, international experts and students in Honduras, training for the actuarial profession should:

1. comply with the international Syllabus;
2. have a strong professional orientation or accent;
3. The supervisory authorities of Honduras have the power to adapt to the needs derived from the activities exclusively attributed to it by the Supervisor of

Honduras, as well as to those derived from relevant areas in the financial, insurance and social security markets.

These are the key factors for the development of actuarial training in Honduras.

However, as actuarial studies are an education aimed at acquiring the knowledge, skills and abilities necessary for the practice of the actuarial profession, it is necessary to strengthen the ethics and professionalism of the profession. This entails the development of the profession at different levels in Honduras, in particular:

- Legislation that specifies and develops the professional activity of the actuary in the different sectors (insurance, financial, tax and social security) in Honduras.
- Establishment of the Professional Association of Actuaries following IAA standards.

This process of developing a MSc. in Actuarial Science is based on higher education initiative and the specific characteristics of Honduras. This is why it is aligned with the following sustainable development goals:

- SDG 4: Quality Education: this initiative addresses the creation of an advanced and specialized higher educational program in actuarial and financial sciences, which directly contributes to the goal of ensuring inclusive, equitable, and quality education. The implementation of this master's program helps improve educational quality in Honduras by providing high-level professional training.
- SDG 8: Decent Work and Economic Growth: The training of qualified actuaries contributes to economic development AQUI and the creation of decent jobs in the country. Actuaries play a crucial role in risk management, pension world and the stability of the financial and insurance sectors, which is essential for sustainable economic growth.
- SDG 9: Industry, Innovation, and Infrastructure: By establishing a high study program that follows international standards, educational innovation is promoted and the educational infrastructure of the country is strengthened. This contributes to the development of a knowledge industry and the capacity for innovation in Honduras.
- SDG 10: Reduced Inequalities: Providing access to specialized training in a developing country helps reduce inequalities within the country and between countries. The implementation of this program helps train professionals who can contribute to the economic and social development of the country, which is fundamental for reducing inequalities.
- SDG 16: Peace, Justice, and Strong Institutions: Training in actuarial and financial sciences also strengthens public and private institutions, as actuaries play a crucial role in risk management and the stability of financial and insurance systems. This contributes to the creation of stronger and more effective institutions in the country.

This is an Author Accepted Manuscript version of the following chapter: J. Iñaki De la Peña, Rodolfo Geovanny Vasquez Pineda and Eduardo Trigo Martínez, Field Work: Designing a Professionalising Master's Degree in Honduras, published in Teaching Innovations in Economics. Towards a Sustainable World, edited by María del Carmen Valls Martínez, José–María Montero, 2024, Springer, reproduced with permission of Springer. The final authenticated version is available online at: https://doi.org/10.1007/978-3-031-72549-4_25

- SDG 17: Partnerships for the Goals: There is a need to establish inter-university agreements and collaborations with the private sector and public authorities. These partnerships are essential for the effective implementation of the program and to ensure that graduates are well-prepared to contribute to sustainable development.

Acknowledgments

This research was funded by the ClioBasque Consolidated Research Group Eusko Jaurlaritza/Gobierno Vasco EJ/GV grant number IT 1523-22.

References

Anderson, L.W. Krathwohl, D.R., et al. (2001). *A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives*. New York: Addison Wesley Longman.

Arsuaga,A., De la Peña, J.I., Garayeta-Bajo, A., Gómez, O., Moreno, R., Trigo, E. (2022). The professional university degree of actuary through Bloom's taxonomy, In *Proceedings of the International Conference of Education, Research and Innovation ICERI20,* pp. 4006-4011. https://doi.org/10.21125/iceri.2022.0973

Arsuaga, A., De La Peña, J.I. and Moreno, R. (2020). Actuarial: una profesión regulada mundialmente (la profesión actuarial regulada). In *XVI Foro Internacional sobre la Evaluación de la Calidad de la Investigación y de la Educación Superior (FECIES)*. Ed Granada: AEPC

Bloom, B.S., Englehart, M.E., Furst, E.J., Hill, W.H. and Krathwohl, D.R. *The Taxonomy of Educational Objectives (1956). The Classification of Educational Goals, Handbook 1: Cognitive Domain*. London: Longmans, Green and Co Ltd.

De la Peña, J.I., Iturricastillo, I. (2010). Desarrollo de un plan de capacitación profesional en Iberoamérica y África a través de un Colegio Profesional. In *EBEN National Congress, Bilbao. 23 -25 June.*

Fernández-Morales, A., E. Trigo-Martínez, R. Moreno-Ruiz. (2015). Improving interdisciplinary competences development with collaborative projects. A study case in Finance and Actuarial Science. In L. Gómez Chova, A. López Martínez, I. Candel Torres (Eds.). *Proceedings of EDLUEARN15 7th International Conference on Education and New Learning Technologies* . pp. 3633-3639. IATED.

Fernández-Morales, A., E. Trigo-Martínez. (2015). Developing professional competences with insurance multidisciplinary projects. In L. Gómez Chova, A. López Martínez, I. Candel Torres (eds.). *Proceedings of ICERI2015 8th International Conference of Education, Research and Innovation (*pp. 2104-2109). IATED.

Fernández-Morales, A., E. Trigo-Martínez, R. Moreno-Ruiz, O. Gómez-Pérez-Cacho (2019). Involving professionals in curricular activities for developing actuarial skills, In *INTED2019 Proceedings.* pp. 9113-9117. IATED.

Heer, R. (2024). A revision of Bloom's Taxonomy of Educational Objectives by Rex Heer. Iowa State University Center for Excellence in Learning and Teaching. Retrieved from https://www.celt.iastate.edu/wp-content/uploads/2015/09/RevisedBloomsHandout-1.pdf

IAA -International Actuarial Association- (2022). *Updated 2017 IAA education guidelines*. https://www.actuaries.org/CTTEES_EDUC/Documents/2017_IAA_EDUCATION_GUIDELINES.pdf

IAA - International Actuarial Association- (2024). About the IAA. https://tinyurl.com/2m9skcyn

García-Aretio, L. (1994). *Educación a distancia hoy*. Madrid: UNED.

García-Aretio, L. (2020). Bloom me ayudó en la docencia presencial y a distancia. Contextos universitarios mediados. https://tinyurl.com/44rrsdjn .

Kok, A. and Garcia, M. (2002). *Professional Responsibilities of Insurance Actuaries*. Groupe Consultatif Actuariel Europeen. https://actuary.eu/documents/prof_resp_ins.pdf

Moreno, R., Trigo, E., Pérez-Cacho, O., De La Peña, J.I. and Iturricastillo, I. (2011). La idiosincrasia del actuario. *Anales del Instituto de Actuarios Españoles*, 17: 123-134

Newton, P.M., Da Silva, A. Peters, L.G. (2020). A Pragmatic Master List of Action Verbs for Bloom's Taxonomy. *Frontiers in Education*, 5:107 . https://doi.org/10.3389/feduc.2020.00107

OECD (2001). *Policy Issues in Insurance, Insurance regulation and supervision in OECD countries*. Paris: OECD Publishing, No. 3. http://www.oecd.org/finance/insurance/1900939.pdf

Ogborn, M.E. (1956). The professional name of actuary. *Journal of the Institute of Actuaries*, 82:233-246.

Popescu, M. M., Romero, M., & Usart, M. (2013). Serious games for serious learning using SG for business, management and defence education. *International Journal of Computer Science Research and Application*, 3(1), 5-15.

Santolino, M. A. (2016). *Cualificación profesional del actuario. Estudio internacional comparado*. Madrid: Ed. Fundación Mapfre.

Trigo-Martínez, E., A. Fernández-Morales (2017). Collaborative projects for developing technological and professional competences in Actuarial Science. In L. Gómez Chova, A. López Martínez, I. Candel Torres (eds). *Proceedings 9th International Conference on Education and New Learning Technologies.* pp. 2767-2772. IATED.

Trigo, E., De la Peña, J.I., Moreno, R., Garayeta, A. (2020). Reconocimiento de la Profesión actuarial: una aplicación interuniversitaria. In *El EEES como solución a las nuevas necesidades educativas.* Ed. Tirant Lo Blanch. Valencia: 438-446.