

IMPROVING TRANSVERSAL SKILLS IN THE STRATEGIC MANAGEMENT SUBJECT IN GLOBAL ENVIRONMENTS OF THE UNIVERSITY MASTER IN BUSINESS ADMINISTRATION (MBA) BY APPLYING THE SCRUM METHODOLOGY

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Abstract

Adapting the university to the European Higher Education Area is leading to substantial changes being made in many aspects linked to its pedagogical model, where one of the fundamental questions is how active methodologies that address learning can be included and integrated into class dynamics. This work presents the results of including a work methodology (SCRUM) to which a series of good practices to work collaboratively and as teams were applied to obtain the best possible project result. This was applied to the subject Strategic Management in Global Environments as part of the Master in Business Administration (MBA), taught on the Alcoy Campus of the Universitat Politècnica de València (UPV), Spain. This work resulted in training both teachers and students in this methodology through it being practically applied and integrated into classes during one 4-monthly period. It led to improved academic performance, and to transversal skills being acquired and improved, mainly those of analysis, problem solving, teamwork and leadership, and planning and managing time.

Keywords: Scrum, strategy, transversal skills, Master Business Administration (MBA), collaborative work.

1 INTRODUCTION

The European Higher Education Area (EHEA) implies substantial changes being made in the university, mainly in its pedagogical model, where the teacher's task is to shift to paying more attention to what students have to do to learn [1]. These changes doubtlessly have a significant influence on several aspects, such as how to plan teaching, the methodology, designing activities, tutorials and evaluating learning. Along the same lines, Fernández-March [2] points out that adapting the EHEA means introducing new elements into syllabi, whose ultimate purpose is to develop skills as learning results during training, methodological renovation and using evaluations as a strategy that must positively influence learning.

Skill is defined as "a latent attribute, knowledge, attitude, proficiency and the faculty for developing a profession, performing a job or academic action, and executing the expected occupational or academic actions and activities suitably and properly" [3]. Thus a skill includes a variety of resources and involves combining supplementary and synergic resources. Therefore within a training framework it is fundamental to reflect on what level of development students must have reached by the time they finish their training so they can become autonomous professionals who are capable of reflection and ethics, and so they can continue with development during their professional lives [2].

In line with this, the Universitat Politècnica de València (UPV) has set up the UPV Transversal Skills Project, whose main objective is to accredit the UPV transversal skills to graduate students of any official degree taught at the UPV. This objective is specified in other more specific ones, of which incorporating skills into students' training by different means or strategies, designing evaluation processes and accrediting flexible and innovative transversal skills, and making the results that students obtain visible to society stand out. What the UPV intends to do with all this is to provide its graduate students added value that allows them to be distinguished from other graduate students. Consequently, this makes the offered studies more appealing than similar offers from other universities, and it highlights what our graduate students have learned when they face employers [6].

In the specific case of the Master in Business Administration (MBA), an Advisory Council for the MBA was created in April 2017, made up of some of the most important companies in their area of influence. The objective was to incorporate, into the master's undergraduate profile, the real requirements of their business context. During the Advisory Council's first meeting, the need for the

MBA students to acquire transversal skills was detected, along with the theoretical knowledge taught in it. Stress was placed on the need to acquire problem-solving and teamwork skills.

Accordingly from the Academic Master Committee, the option of using a teamwork/problem-solving methodology in several of the Master Degree subjects was considered transversally so that students and teachers could reinforce these specific skills. After analysing the various available options, a decision was made to use the SCRUM methodology, a framework in which people can tackle complex adaptive problems, while productively and creatively delivering products of the highest possible value [4]. SCRUM is a framework of processes which has been used to manage the development of complex products since the beginning of the 1990s. It is not a process or technique used to build products, but is instead a framework within which several processes and techniques can be used. This methodology displays the relative efficacy of product management practices and development practices so that they can improve. Thus SCRUM is particularly indicated for projects undertaken in complex environments where results need to be obtained quickly, requirements are constantly changing or are poorly defined, and where innovation, competitiveness, flexibility and productivity are essential [5]. In SCRUM a project is executed in short set time blocks (iterations that normally last 2 weeks, but can last 3 weeks and up to 4 weeks for some teams, which is the maximum limit for feedback and reflection). Each iteration has to provide a complete result, an increase in the end product that is susceptible to being delivered to the customer with the minimum effort whenever it is ordered.

The purpose of the present work is to present the results of applying this methodology to the subject Strategic Management in Global Environments of the MBA taught on the UPV's Alcoy Campus. Thus the intention is for students to be capable of working as teams by solving companies' real problems in real time by adjusting to their needs and requirements at all times. The ultimate objective is to achieve better academic performance, and to acquire and improve transversal skills, mainly those that involve analysing and solving problems, teamwork and leadership, and planning and managing time by practically applying SCRUM and integrating it into the work done as part of this subject.

The present work is arranged as follows: the UPV's MBA is firstly contextualised, as is the Strategic Management in Global Environments subject. Next the main characteristics of the SCRUM methodology, and its applicability to management processes in general and education in particular, are explained. Then how this methodology has been applied to the subject that is the study object is indicated, along with the main results obtained, encountered problems and the proposed solutions. Finally, the main conclusions drawn from applying this methodology and proposals for future lines of work are presented.

2 BACKGROUND

The MBA is contextualised in this section, as is the subject to which the SCRUM methodology was applied as a pilot experiment.

2.1 The UPV University Master in Business Administration (MBA)

The main objective of the UPV's MBA Programme is to train future managers and businesspeople who are qualified to manage and lead organisations in today's global environments, which are characterised for their by extreme complexity, dynamics and uncertainty. The intention of the MBA subject is for participants to acquire overall knowledge about business management in an international environment that allow them to develop essential management skills to lead different business projects in all kinds of organisations. In this way, MBA intends to respond to the business world's real and current needs.

MBA aims to provide students with knowledge that enable them to creatively analyse and solve complex situations in the business management domain by supporting them to use and develop theoretical-practical, methodological and information analysis tools. Specifically, the intention is for students to acquire advanced theoretical and practical knowledge in the following fields: organisation, business management; accountancy; finances; marketing; leadership, management and teamwork skills; company tax systems; analyses of the environment; operations strategy and management tools for decision making.

Apart from training in technical aspects, transmitting greater sensitivity to the ethical aspects of business operations to students is also considered important to evaluate companies not only in economic terms, but also in social and environmental terms.

MBA lasts three semesters with 90 ECTS for hours in lectures/classes, which are distributed as shown in Table 1.

Table 1. *Subjects of the UPV's Master in Business Administration (MBA).*

| SEMESTER 1 |
|---|
| The International Legal Environment (4.5 ECTS) |
| The International Economic Environment (4.5 ECTS) |
| Statistical Tools for Management (4.5 ECTS) |
| Marketing Management (4.5 ECTS) |
| Advanced Financial Management Techniques (6 ECTS) |
| Operations and Technology Strategy (4.5 ECTS) |
| SEMESTER 2 |
| Strategic Management in Global Environments (4.5 ECTS) |
| Developing Management and High-Performance Team Management Skills (4.5 ECTS) |
| Marketing Intensification Block or the Banking and Financial Sector (18 ECTS) |
| SEMESTER 3 |
| Corporate Management Intensification Block and Entrepreneurship or E-Business (18 ECTS) |
| Final Master Project – FMP (12 ECTS) |

2.2 The Strategic Management in Global Environments Subject

The Strategic Management and Global Environments subject is an advanced vision of strategic management. To study strategic management, acquiring both the basic theoretical concepts that make up this model and the practical applications related with the way these concepts materialise in the reality is necessary.

Today's current globalisation of economy, along with all its complex and uncertain characteristics, enhances the intensity of competition and obliges companies to develop in a global productive space. This is why this subject intends to look closely at top management problems when a company attempts to act coherently with its environment and, at the same time, maintains its internal equilibrium. What it seeks is that students learn to manage change within companies in order to adapt them to new environments where competition grows. Thus it closely examines the strategic innovation concept by seeking to create a sustainable systemic approach of reaching the market by challenging traditional business limits. New business management methods are studied and applied, along with available tools to generate and re-orientate business models that adapt to this new reality.

The importance of the strategy and its development for successful organisation makes this subject one of the central ones in the Business Organisation area, especially in MBA. This subject, along with the Developing Management and High-Performance Team Management Skills subject, forms the block that corresponds to the 9 ECTS to be taught as a compulsory subject of Management skills. Their distribution in credits is indicated in the UPV's MBA's syllabus and is shown in Table 2.

Table 2. *. Distribution of the ECTS of the "Strategic Management in Global Environments" subject.*

| TYPE OF CREDITS | ECTS |
|----------------------------|-------------|
| Theoretical credits | 2.5 |
| Theory in class | 2.0 |
| Theory in seminars | 0.5 |
| Practical credits | 2.0 |
| Practical classes | 0.5 |
| Practical lab sessions | 1.5 |

The subject is taught in the Master's second 4-month period after looking at the basic foundations about the internationalisation and globalisation of markets in the previous 4-month period. Other subjects related and also appointed to the UPV Department of Business Organisation are "Marketing Management" and "the Operations and Technology Strategy", which are taught during the first 4-month period, and both belong to the core curriculum of Business Operations Management.

Regarding what the Strategic Management in Global Environments subject offers to the degree's profile, it is necessary to firstly indicate that the UPV's MBA offers graduates a wide range of professional opportunities in relation to the sector, company type and tasks to be performed. This degree mainly trains students to perform different management tasks in business management or in the main functional areas (marketing, human resources, production, finances, accountancy, etc.). In this context, the present subject offers training about the main management tasks by focusing interest on outlining and implementing the strategy as a determining element for organisation to be successful in a globalised environment. The aim of this subject is that students understand the meaning of strategic management in today's context, where developing the strategy can help challenges in this environment to be overcome and for the company to be competitive. This subject thus enables future graduates to perform and take on management tasks and responsibilities in both public and private companies.

Of the main skills that students aim to acquire with this subject, the following stand out:

- The capacity to apply acquired knowledge and their problem-solving capacity in new or scarcely known environments in broader (or multidisciplinary) contexts related to their study area
- The capacity to efficiently manage organisations in complex, dynamic and highly competitive environments by defining and devising strategic plans that are sustainable from economic, environmental and social viewpoints
- The capacity to develop entrepreneurial skills to devise business plans that are sustainable in economic, environmental and social terms and efficiently include the company's functional areas
- The capacity to simulate business activity and to coordinate business processes
- The capacity to lead innovation processes and to develop new business opportunities in a global environment
- The capacity to organise and plan business management
- The capacity to critically reason for business management
- The capacity to make decisions in business management environments

After bearing in mind the learning objectives to be encouraged with the subject, and taking the skills defined in the degree as a reference point, the corresponding contents were selected and grouped into didactic units. All the elements needed to understand the advanced Strategic Management in Global Environments subject process were summarised.

By starting with a systemic conception of organisation, studying the business strategy was taken as a determining element for business success. Hence the subject looks closely at the phases in which the most appropriate strategy for each business context is outlined and implemented. These contents are presented throughout the five themes and are organised into two didactic units, as we can see in Table 3.

Table 3. *The Didactic units of the "Strategic Management in Global Environments" subject.*

| |
|---|
| DIDACTIC UNIT I. Strategic Management to face the globalisation of markets |
| Theme 1. The traditional Company's Strategic Management Model |
| Theme 2. Need to change business models. Strategic Innovation |
| Theme 3. Creativity Techniques Applied to Strategic Innovation |
| DIDACTIC UNIT II. Generating innovative business models |
| Theme 4. The Blue Ocean Strategy |
| Theme 5. Business Model Canvas |

Finally, the teaching methodology used in the subject intends to provide the classes with a very practical approach by organising participative classes and practical sessions, which encourage group work and the use of business games and simulators. Whenever possible, collaboration will be sought from companies from the environment.

The main objectives sought with this methodology are as follows:

- The teacher doing away with the traditional master class outline
- Getting students involved the way classes operate
- Reinforcing acquired theoretical knowledge
- Studying and analysing large-, medium- and small-sized companies in-depth
- Analysing their evolution and decisions to meet their objectives
- Familiarising students with the search for and analysis of specific information
- Improving students' communication capacity

3 THE SCRUM METHODOLOGY

In recent years we have seen how flexibility and adaptation to a changing market have been a turning point in companies' survival. In the 1980s, Japanese authors Hirotaka Takeuchi and Ikujiro Nonaka [7] [8] developed a form of organisation based on endless processes supported by a team's knowledge. Nowadays this outline is considered the basis of today's agile management culture to adapt to change, known as SCRUM, which comes from the rugby term in English.

Years later, Schawber [11] defined the rules to manage and develop complex projects within the SCRUM frame. SCRUM defines the development process as a series of unconnected activities that combine known and reliable tools and techniques with a capable and multidisciplinary development team. Back in the first SCRUM guide [5], SCRUM was defined as a framework to develop and maintain complex projects and products that adaptively deal with their development, while delivering products with the highest possible value. SCRUM is based on the empirical theory to control processes; i.e., decisions are made according to what is known, and three pillars are defined that support implementing the control of empirical processes: 1) transparency (a common language is shared); 2) inspection (detecting unwanted variations); 3) adaptation (if a process shifts from acceptable limits, an adjustment must be made). This allows an iterative incremental approach to be achieved to optimise predictability and to control the risk.

The main SCRUM components are:

The SCRUM team:

- Product owner: optimises the product value and manages the product backlog
- SCRUM master: manages the SCRUM process, eliminates any obstacles for the development team to centre their tasks, coaching
- Development team: a multifunctional self-managed team with between 3 and 9 members that is in charge of creating increments

Artefacts:

- Product backlog: an inventory of all pending tasks that must be performed. The Product owner is the owner
- Sprint backlog: these are the product backlog items to be developed during the sprint, as well as a plan to deliver them. The development team is the owner
- Increment: the sum of all the Product backlog elements completed during the sprint. This increment must provide a potentially usable product

Events:

- Sprint: it is the basis of SCRUM, a given 1-month time period, or shorter, in which an increment is created of the "done", usable and potentially unfolding product. A sprint begins immediately after finishing the previous one. A sprint contains the other meetings, which are also considered events.

| | Sprint Planning | Daily Scrum | Sprint Review | Sprint Retrospective |
|-------------------|---|--|--|---|
| Frequency | At the start of a sprint | Daily | One at the end of a sprint | One at the end of a sprint |
| Duration | Maximum 8 hours | Maximum 15 minutes | Maximum 4 hours | Maximum 3 hours |
| Attendants | The whole SCRUM team | The development team and, optionally, the Scrum Master | The SCRUM team, plus stakeholders | The SCRUM team |
| Input | Definition of "done", capacity and the speed of the development team, product backlog, and the sprint retrospective conclusions | Tasks performed the day before | Finished sprint backlog items | Sprint development |
| Process | Analysing, evaluating and selecting product backlog items, decomposing items in an action plan | Answer three questions: What did I do yesterday to meet the sprint objective? What will I do today? What obstacles do I encounter? | The finished work is shown (increment), and sprint development is discussed. | Inspect what the last Sprint was like in relation to people, relations, processes and tools. Identify and order the most relevant elements that turned out well and any possible improvements |
| Output | Sprint goal and sprint backlog | Plan for the day | Stakeholders' input is obtained and dates are estimated to finish according to the progress made | Create a plan to implement improvements into the way the SCRUM team does its work |

The SCRUM methodology came about in Japan to organise work in any kind of company [12]. As SCRUM rules evolved and were published, it was increasingly implemented into technology-based companies, especially software development [11], and its framework was the most widely used by newly created companies. It was not in vain that Sutherland, J. Harrison, N and Riddle, J [13] ensured that surveys indicated that 43% of the agile projects undertaken with SCRUM ended satisfactorily and on time.

However, the industry in any of its fields is not the only sector in which agile methodologies have been applied. We can see how [9] and [10] have also been applied it in university teaching, which is also the case of the present work, and the results of this application are offered in the next section.

4 APPLYING THE SCRUM METHODOLOGY TO THE STRATEGIC MANAGEMENT IN GLOBAL ENVIRONMENTS SUBJECT

As mentioned in the Introduction at the start of this work, the ultimate objective is to improve academic performance of the students who study the subject, and to acquire and improve transversal skills, mainly analysis and problem-solving, teamwork and leadership and planning and managing time skills, by practically applying SCRUM to the work done in this subject. To achieve this, the SCRUM methodology was applied throughout the subject to propose new innovative business models for four companies on the MBA Advisory Council.

Work was done in a company from the plastic sector, in one from the food sector, in an electronic marketing company, and in a local radio station that belongs to a leading national radio in the sector. Here the idea was for students to come into contact with very different realities in sector, size and problem-solving terms. All the students who studied the subject visited all four companies, with which they could later sent evaluations and offer feedback about each group's proposals, which got them well involved in undertaking projects.

The aspects to work on in each company were as follows:

- The company from the plastic sector: it did not consider any given problems, but asked students to analyse its current business model, and to propose some innovative business lines that could supplement those it had and were underway
- The company from the food sector: it wanted students to analyse its use of social networks, and for students to propose improvement in them, because the company considered them to be one of its main weak points
- The electronic marketing company: it asked students to analyse one of its business lines, which was its database service for other companies, to consider any novel variation to this service
- The radio station: this is a company with a long-standing history and ample experience, but it urgently needs to be modernised and to work on its brand name image.

Students were divided into four self-managed teams in an attempt for them to be interdisciplinary as they included people with different degrees to, for example, compensate those from engineering with those from business administration studies.

A general work index was considered, which was divided into four SPRINTS to be worked on, as follows:

- SPRINT 1: A SWOT analysis of the company and consider its current business model with Business Model Canvas
- SPRINT 2: Devise the company's current strategic frame and consider new possibilities by applying the outline with the six Ocean Blue paths
- SPRINT 3: Choosing a new strategic frame, and analyse both non-customer levels and the frame by the strategic sequence
- SPRINT 4: Consider a new innovative business model for the company

Each group member clear knows his/her role in the group according to the SCRUM methodology, with the Product Owner in charge of communicating with the corresponding company, the SCRUM Master in charge of internally coordinating the group and, given the academic character, they all made up the Development Team in charge of the entrusted tasks.

In each SPRINT every group indicates the progress it made to the other groups. This was followed by a time for questions, remarks and feedback by the other groups. These sessions were especially productive as all the students learned about all the problems in the four companies, and could voice their opinions as they were well aware of the problems, which led to very interesting contributions. After the other groups made their contributions, the teachers also gave their views, which meant that each group received relevant feedback from several sources to improve work in further sessions. Sessions ended with a meeting held with each group to analyse both the obtained results and the degree of personal fulfilment of each team member's objectives, propose improvement actions and to distribute tasks for the next SPRINT.

Finally, a public session was held to present the results to companies and the public in general. During this session, each group presented its proposal to the corresponding company and a debate about them took place later. Company satisfaction was extremely high, and some students were even contracted in them to put the proposed solutions into practice.

Regarding the degree of fulfilment of the objectives set out, we now go on to explain the results below.

The average mark for the academic performance of the students registered for the subject using the SCRUM methodology was 8.7 out of 10, while that of previous academic years, in which SCRUM was not applied, was 7.6 out of 10. Thus academic performance improved by more than 10%.

A significant improvement in transversal skills was noted in the three analysed skills, as we go on to explain, for classifying skills being acquired on this scale: A – Excellent; B – Adequate; C – Being developed; D – Not achieved.

- **The analysis and problem-solving skill:** when the SCRUM methodology was applied, if deviations occurred in companies' requirements/needs, it was possible to react by adjusting to these new requirements. In this way students were able to work as teams, solve the real problems in the companies in real time, and adjust to their requirements/needs at all times. As for acquiring this skill, the mean marks of former academic years were 22% for A and 78% for

B, which in the present academic year went from 53% for A and 47% for B, and is a substantial improvement.

- **The teamwork and leadership skill:** by assigning specific roles to each member of the groups, organising self-control sessions and considering improvement for groups' internal functioning as part of the SCRUM methodology specifications greatly improved this skill being acquired, which went from 0% for A, 95% for B and 5% for C to 74% for A and 26% for B.
- **The planning and managing time skill:** for this skill, making periodical deliveries, planning individual and group tasks in each delivery and organising weekly follow-up meetings that involved SCRUM has meant increasing the level of this skill being acquired from a mean mark in previous academic years of 22% for A, 67% for B and 11% for C to 63% for A and 37% for B.

One example of students acquiring skills is that they solved the problems that arose while they undertook projects collaboratively and without their teachers intervening. It is worth mentioning that problems were not solved by self-management in one team, but the teaching team solved a conflict by reassigning SCRUM roles to other team members.

Thus it was proven that applying this methodology helped meet the objectives considered to improve academic performance, and to acquire and improve students' transversal skills.

5 CONCLUSIONS AND FUTURE LINES

General student satisfaction with the methodology being applied was high with a score of 4.55 out of 5 in the internal study surveys.

Students indicated some aspects to improve; for example, they would have liked to have had more feedback sessions in each group with teachers, apart from the sessions with the class as a whole, to further improve each delivery and to consider more specific doubts.

With this pilot experiment, the mid-term application of this methodology to more Master subjects was considered. The long-term objective is to apply it to all the subjects, and to take one step further and do joint works with several subjects about the real problems encountered in the companies of the Master's Advisory Council by working on projects.

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