

# Pattern for Graduate Student Company

*Petko Ruskov<sup>1</sup>, Milena Stoycheva<sup>2</sup>, Yanka Todorova<sup>3</sup>*

<sup>1</sup>*Sofia University, FMI, 125 Tzarigradsko shosse, Sofia, Bulgaria, [petkor@fmi.uni-sofia.bg](mailto:petkor@fmi.uni-sofia.bg)*

<sup>2</sup>*JA Worldwide and JA Bulgaria, Sofia, Bulgaria, [milena@jabulgaria.org](mailto:milena@jabulgaria.org)*

<sup>3</sup>*Sofia University, FMI, 125 Tzarigradsko shosse, Sofia, Bulgaria, [todorova.yana@gmail.com](mailto:todorova.yana@gmail.com)*

## **Abstract**

Graduate Student Company (GSC) is an innovative educational model to teach entrepreneurship competencies based on the learning-by-doing methodology. It represents the formation of a student-operated mini-company which functions like a limited company, and the members buy shares in the company through personal contributions. During the process of learning, the students understand the opportunities of how to start and run a company and go through the whole company life cycle from establishment to closure.

Our approach involves review and observation of European and global practices in the field of entrepreneurship education; practical implementation of the Junior Achievement –Young Enterprise (JA-YE) methodology for the Graduate Student Company. The main findings represent the experience and best practice of the Junior Achievement -Sofia University partnership and propose a model for future implementation in both engineering and scientific faculties. Learning-by-doing methodology is a key success factor for teaching entrepreneurship. Patterns are seen as a good repeatable practice to encourage involvement and mentorship on part of the business community and improve the learning environment and entrepreneurship ecosystem. The target audience are developers of curricula, teachers and business angels. The GSC pattern is expanded and implemented in 10 more universities in Bulgaria during 2008-2009 academic years.

## **Keywords**

*Graduate Student Company, life cycle, learning patterns, learning-by-doing*

## **1. Introduction**

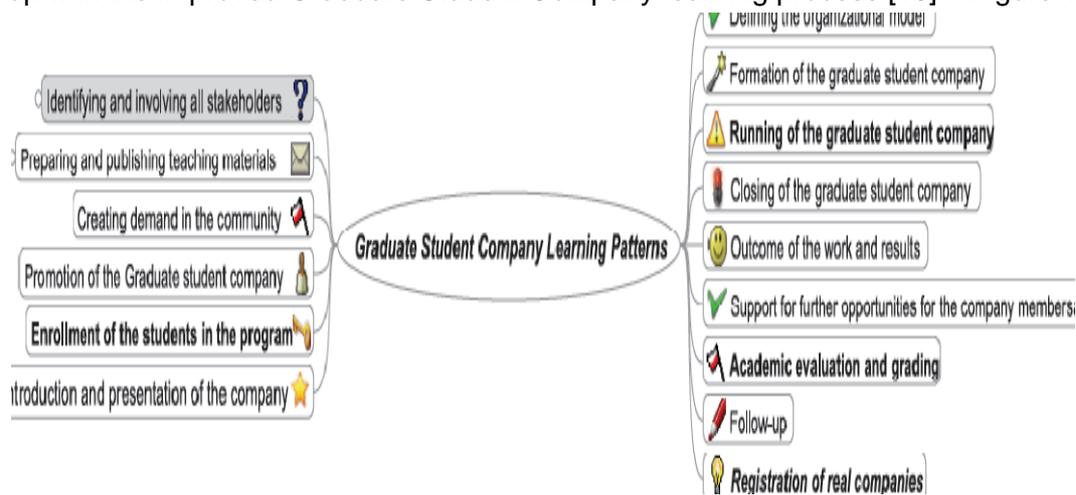
The educational processes like the processes in the service industries share two comparatively common features: intangibility and interactivity. Graduate Student Company life cycle process – which is presented in this paper as a pattern - typically has progressed further in terms of intangibility and interactivity than most other sectors being an innovative representative of the educational sector. Like the other service industries it has the following main characteristics according to Miles [13]: co-terminality, low portability, information intensity, fundamental processes, knowledge intensity, and market relations. The education of students from scientific and technology faculties in technology entrepreneurship in this complex and dynamic environment requires the evaluation and response of all of the above factors and their impact on the education. Therefore, we made a conscious decision to utilize the pattern approach which later on will help us to share and repeat the GSC practice.

## **2. Graduate Student Company Organizing Principles**

The organizing principles we have chosen represent a structure which is a set of syllabus, patterns, and academic and business services [12, 14, and 15].

- **Syllabus** is an organizing framework that groups together separate learning lessons and themes into one specific university course.
- **Patterns** are organizing concepts that facilitate dynamic mapping from stakeholders requirements to learning-by-doing educational designs.
- **Services** are a comprehensive set of activities that ensure the smooth and successful implementation of the academic processes and the related administrative and business procedures.

In the context of all of the above and having set our strategy and goals, we reviewed our processes and analysed the best practices in the field [4, 5, 6, and 18]. As a result, we came up with the improved Graduate Student Company learning process [16] – Figure 1:



**Figure 1.** Graduate Student Company process

The above described process of the GSC life cycle represents a pattern which the authors recognize consists of several sub-patterns. It is our intention in future works to dive deeper and uncover and describes them.

## Patterns

In principle, a pattern describes a particular problem and its solution context [9, 10, 11]. Specifically in these books, a pattern describes a (set of) problematic situation(s) for the development team that can be fixed by applying an agile practice [1, 3]. Patterns are to be trusted because each one has been used several times with real development teams and projects — they are not one-off solutions or ‘good ideas’ that might or might not work [2]. Patterns are "discovered" and not "created."

The pattern format used in [1] by Elssamadisy is as follows and has been modified in some sections of the current pattern:

- **Name:**
- **Description:** a brief overview of the practice or cluster. Not included in this pattern.
- **{Dependency Diagram:}** A diagram showing inter-practice dependencies (for practices) and grouping (for clusters). Not included in this pattern.
- **Business value:** A sorted description of the business values this practice or cluster improves.
- **Sketch:** A fictional story that describes this pattern being used on a software development project in a given context.
- **Context:** The preconditions and environment where this pattern is useful. The context is a collection of invariants: issues that do not change by applying the pattern.

- **Forces:** Used to elaborate context and give specific issues that are problems (partially) resolved by this pattern. In fact, correct application of the pattern should remove many of the forces.
- **Therefore:** The pattern description.
- **Adoption:** Steps, ordering, guides to adopting this pattern.
- **But:** Negative consequences that can occur from applying this pattern.
- **{Variations:}** Different ways this pattern has been implemented successfully other than that described in the Therefore section.
- **{References:}** Where one can read more.

### 3. Student Company Patterns

Based on the 4 year experience with the student company model, a pattern for its implementation has been emerged - GRADUATE STUDENT COMPANY pattern. It is a higher level of abstraction of the GSC lifecycle and therefore can be further developed in many sub patterns – such as curricula, enrolment of students, company operations, closing the company, etc.

**Name:** Graduate Student Company Pattern

**Description:** Most sciences and technology universities today focus on theory that does not reflect the competences and capabilities needed on the market. The GSC set of patterns describes a learning-by-doing paradigm. Students are educated and learn through a process of creation, registration and running of a student company. The GSC functions as a real company (but is registered with the local Non-Government Organization entity office/ or government department) in real market conditions. The participants in the company receive advice and mentoring by experts and practitioners from real business organizations but run the company themselves. After the GSC educational process, successful companies proceed with a legal registration and establish as new start-ups. One of the major problems in educational system is the existence of a big gap between academia and business. It is also a recognised phenomenon that needs to be addressed on a pan-European and global level. The traditional university education is rather static and lagging behind the current dynamic economic environment. The classical knowledge life cycle from the moment of creation of knowledge and delivery to the students through books and professors is much slower than the direct contact with the knowledge creators. In the side of the continuum, for students to “plunge” directly in the real business without going through the practical learning curve will take this activity out of the educational life cycle. However, the implementation of the GSC model guarantees interaction and contact of the students with practitioners and consultants from the real business sector. Furthermore, it helps to eradicate the problem of lack of practical experience and work in real business conditions.

**Problem:** How does one motivate and educate science and technical student to have entrepreneurial competences and attitude.

**Business value:** The GSC added value to all stakeholders in the chain – students perform in a real market environment and build experience; universities cooperate with the existing respective industries and transfer competences; employers participate in the educational

process and update syllabuses; local and central governments are recipients of the benefits the active citizens of their community provide. The GSC delivers the real practice value to the customers: students, potential employers and community.

**Sketch:** Students from the Masters Degree Program “e-Business and e-Government” of the Faculty of Mathematics Information Science of Sofia University have the elective course Entrepreneurship – Graduate Student Company in their curriculum. Prior to the beginning of the academic year, JA Worldwide, the oldest and the fastest growing organization teaching economics, business and entrepreneurship in the world, organizes and sponsors training of teams of professors and students from technical and scientific faculties and universities in the country, delivered with the support and participation of business consultants and practitioners from the business sector. The latter conduct a promotion campaign among the students at large from these faculties and universities, and established 2 Graduate Student Companies which followed the real business educational process of Junior Achievement and created firms, formed departments, appointed staff, issued shares, designed and developed a product and produced it as well. At the closing stage of the process, the members of the company participated in a national, regional and global competitions for a business plan and a best company and the winners represented the country in the European and global wide competition for a best Graduate Student Company and business plans.

**Context:** Preliminary conditions for conducting this program (course and training) through this strategic pattern include securing that the course is a part of the elective offerings in the curricula; training of faculty selected students in real company setting by the business sponsors of the program.. It is necessary also that teaching materials, guides for consultants, teachers, and students are secured for the participants and provided to them. These conditions are enforced and true for the respective academic year and do not change while implementing the pattern. A GSC is not expensive to run and there is no risks for the stakeholders.

**Forces:**

- **Delivering value to the customer:** The education offered in the majority of the universities today is rather academic and theoretical and does not meet stakeholders' expectation in reflecting the dynamics of today's global market economy. But, involving business consultants in the process delivers the real practice value to the customers: students, potential employers and community.
- **Need of Multidisciplinary competences:** Traditionally, the teaching approach lacks integration of multidisciplinary competences, i.e. technology, business, human behavior, etc. However, in the carried out GSC format, students will practice and learn many lessons in creativity and innovation and apply skills and competences from different disciplines.
- **Measuring students' performance:** The classical method for measuring educational results is rather subjective and dependent on a limited number of evaluators. However, the GSC model allows the students to have a self-evaluation through public presentations and filming of their performance, as well as feedback from participation on the real market or in national and international contests and competitions.

**Therefore/Solutions: Establish a Graduate Student Company (GSC).**

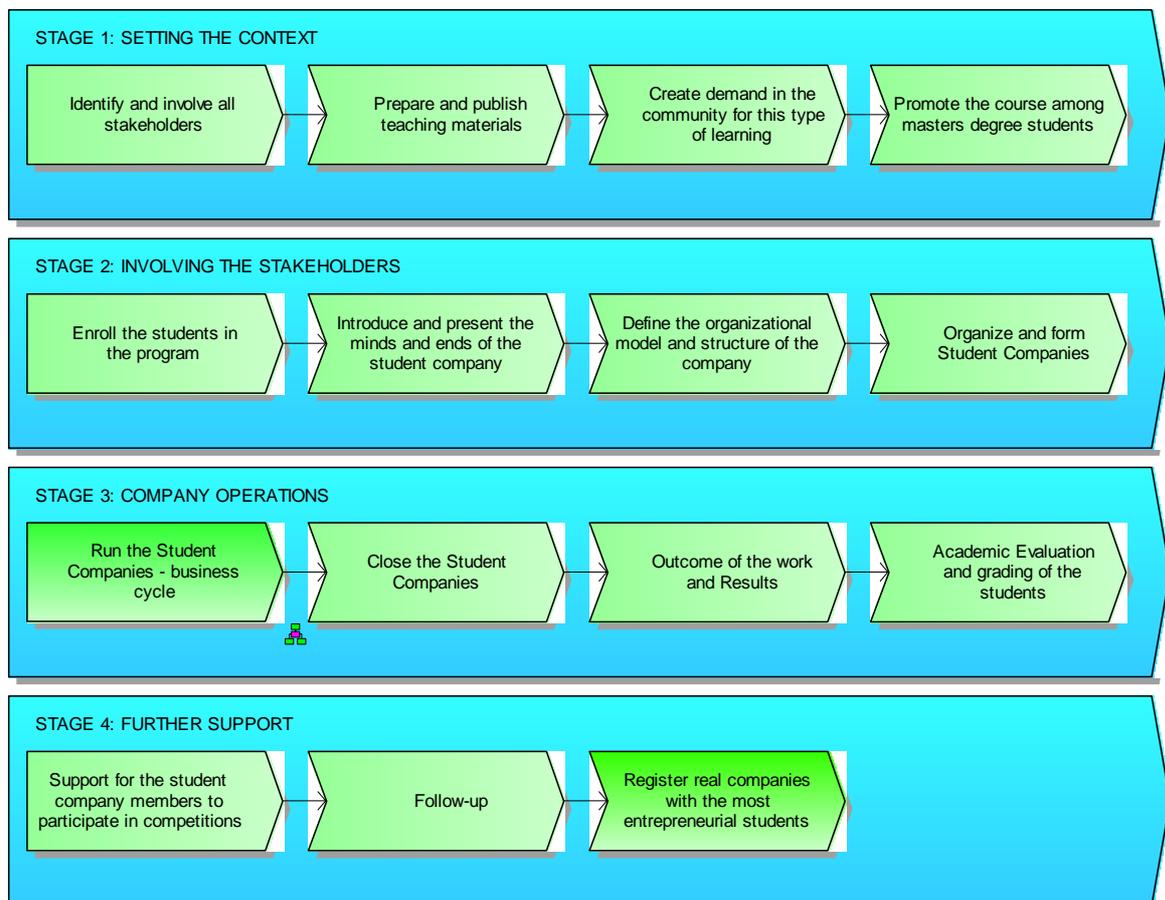
A GSC provides post-secondary students the opportunity to experience running their own company, giving them an insight into how their talents could be used to set up in business for themselves. GSC students acquire real experience of the world of business: creating and researching a business plan, taking responsibility and being accountable to their shareholders for the running of the company. Through this program students develop attitudes and skills necessary for personal success, lifelong learning and employability, plus

an understanding of how business works; gain an insight into self-employment, business creation, risk taking and coping with adversity, with advice and support of business consultants available.

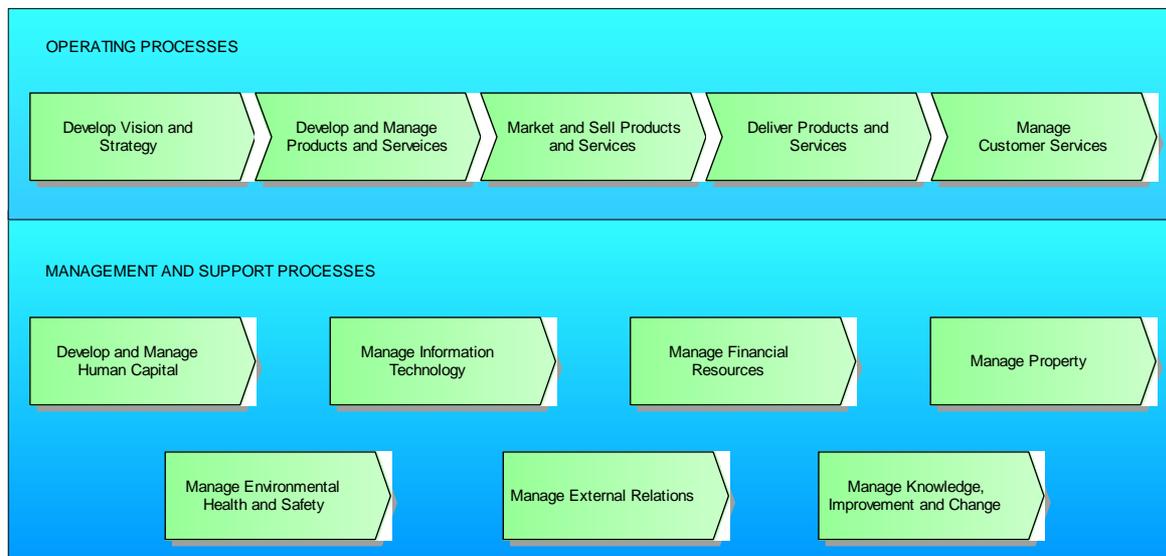
During the one and/or two semester educational process (depending on the specific local environment) the students form their own student company, manage it efficiently and achieve a real financial result at the end of the course. The Graduate Student Company functions like a limited company, and the members buy shares in the company through personal contributions. The number of participants is 12-20 people, and they operate in departments with Vice presidents as heads and a President as the CEO of the company. Two real life examples describing the processes and GSC case studies are presented in the Section 4 of the current paper.

**Adoption:** Most of the experience of the authors in the delivery of this program has been with students from high schools and some college students. The current program has been upgraded, adapted and innovated for Masters' degree students from technical and scientific faculties. The authors are convinced that such a course adds great educational value for the students with such background as it exposes them and develops their entrepreneurial mindset and business competency.

Our experience so far, has provided enough evidence that the student company life cycle pattern can be one of the steps to address this issue and apply an innovative and hands-on approach to it. The stages in the process of the GSC are many and follow the logic of a real company. To indicate where there are more patterns, the authors use capitals or terms of (potential) sub patterns. The Graduate Student Company Learning processes and their Stage Titles (Figure 2) as well as the Student Company Business Cycle based on APQC's [20] Process Classification Framework (Figure 3) are visualized and outlined below. Figure 3 shows a different view of the value added chain.



**Figure 2.** Graduate Student Company Learning processes



**Figure 3.** Student Company Business Cycle based on APQC's Process Classification Framework

**But:** Negative consequences: Specific factors and conditions which can create problems for the delivery of the pattern are related to the threat of too much theoreticizing of the course. Negative consequences may be observed when implementing the pattern if the students are not properly consulted and they are allowed to divert from the educational process or they spend too much time on the company and leave their other obligations unattended. Additionally, the GSC course is an empowering course for students in terms of “going-for-real” through the process of running a business. However, the fact that there are limitations in terms of registration and cap on the capital creates a challenge for the students as they are functioning in real market conditions and yet have to comply with the requirements for less capital. One of the ways to overcome such negative consequences is to have closer interaction with the business consultants so that the students can feel and see the “value-added” that they are also creating for the business. Ultimately, the best solution to make the experience and model really “valid” is to secure a support structure for student start-ups that is supported institutionally by the government.

**Variations: The GSC allows the students to experience the whole idea of going through the life cycle of a real company.** The program can be delivered in the following variations:

- This program is usually delivered for students from high schools and college. However, these age groups lack some of the more sophisticated business experience (like with the master’s degree students), critical problem thinking, ability to see alternative solutions and decision-making.
- The authors are specializing in technology entrepreneurship and therefore find the pattern most appropriate for students from scientific and engineering backgrounds. However, there is also positive experience in applying it in economic and business faculties as it adds the hands-on experience and entrepreneurial approach in education.
- One or two semesters. If offered two semesters this will allow for more in-depth development of the product and its activity and better strategy for its development. It is a good option to use with unemployed specialists for the development of their entrepreneurial skills and competences [7].
- The best configuration, based on the authors experience is a team of approximately 15 students, more or less. This allows for a good-sized company organization which has all

of the main departments manned, and at the same time provides a format for effective communication in smaller groups.

- The course is not limited to running a Student Company where students buy shares – there are options to attract a sponsor and run the company with the funding/money of an investor as well. However, again based on the experience of the authors, the closer the delivery of the course to real market conditions and the more concrete the requirements are, the clearer and better the outcome is in terms of achieving specific results for developing entrepreneurial mindset and business competency in the students.
- It is possible to run a company in a virtual environment, especially if participants are from different countries – almost entirely. We believe though that for a real business to occur, having trust in ones' business partners and building relationships is critical. Therefore the model should provide for at least one face-to-face meeting.

**Literature:** You may read more on this pattern in:

Stoycheva M., Ruskov P., Entrepreneurship Education in Engineering and Scientific Faculties, Proceedings of the International Conference for Entrepreneurship, Innovation and Regional Development ICEIRD 2008, Skopje&Ohrid, Macedonia 8-12 may 2008, pp. 605-610, ISBN 978-9989-2636-4-4.

Ruskov P., Stoycheva M., Graduate Student Company Learning Patterns, Proceedings of the International Conference for Entrepreneurship, Innovation and Regional Development, ICEIRD 2009, 24-25 April 2009, Thessaloniki, Greece, pp.231-239, ISBN: 978 -960-89629-9-6.

**GSC known uses/applications:** After a 4 year-long experience in running the GSC, the authors developed the Student Company Lifecycle Processes and in applying them are presenting two case studies of successful GSCs.

- ***Case studies for graduate student companies***

### **YPM – Start Point**

Sector: Products  
Employees: 15  
Location: Bulgaria

#### **The big idea**

To be the most popular on-line and publishing media focused on issues for and targeting the Bulgarian students. To create community that enables students and business across Europe to share ideas and fill the gap between them.

#### **What they do**

The product "Start Point" Magazine is a monthly publication distributed for free. The second part of the product is a Start Point web site, where the magazine content can be found. Articles from the site are translated in English and accessible all over Europe.

#### **The challenge**

The participants in the YPM-Start Point Company started with a brain-storming session and analyzed the current environment in the country. They concluded that there is a gap between education and business in Bulgaria. They identified the challenge to create a bridge among them. Another problem is the need of popularization of Entrepreneurship among young people and its integration in the education programs.

#### **The solution**

**The GSC life cycle pattern provided the right format for the participants to address the problems and challenges that they identified.** "Start Point" magazine is entirely intended

for young people, who make their first steps in business or career. It provides information for current interesting events related to business and education. The purpose is to provide different perspectives for starting a new business and career growth.

On-line Magazine - All articles can be found on the magazine's web site. Each section has a forum, allowing readers to share their experiences and ideas between each other, related to the magazine staff.

"Start Point" is positioned on the market of free and online media, aimed at students and issued monthly. It is the first magazine of this kind, offering information on current and important topics, related to business and education. The articles are written in accessible language and the information is presented in an interesting way. Through its website, the magazine reaches much larger audience.

### **Issues arising**

To facilitate and create common interests between business and education YPM has to develop and promote a web site and a forum. In this way they allow effective communication between business and students. More over with organizing, assisting and participating in various initiatives, seminars and forums, they contribute to the building of better relationship between business and education.

### **The outcome**

Even with the first issue the company realized a positive outcome. It was achieved because of the strength and potential for development of an innovative idea of free student magazine, linking businesses and students. Proofs of this are the companies that supported the idea in the beginning.

### **What next?**

To achieve progress and growth YPM have to:

- Increase the volume, by getting more funds attracted by advertising or other sources.
- Reach a maximum number of readers.
- Increase the distribution area.
- Increase the revenue from advertising, through aggressive marketing strategy and maintaining a high quality of information provided by us.
- Increase the number of pages, by attracting new advertisers.
- Build a good team of authors through continually attract new young people.
- Build a partnership network of organizations and associations with similar to their goals.

## **Art & Innovation Group**

Sector: Products

Employees: 8

Location: Bulgaria

**The big idea:** To help reducing environmental pollution.

### **What they do:**

Alternative eco-product for the polyester bags - bags made from recycled paper.

### **The challenge:**

According to the Ministry of Environment and Water three billion and two hundred million plastic bags are bought in Bulgaria every year. If we tie together those bags (and assume that a bag is long on average 30 centimeters), we may reach the moon, then back to Earth and back to the half of the distance. A plastic bag is produced for 5 minutes. It is used for average 30 minutes, and for its degradation is needed between 100 and 400 years. The participants identified the problem of a lack of concrete solutions to deal with the environmental pollution.

### **The solution**

**The GSC Life cycle pattern showed the participants a way of creative thinking and approach to the problem. The team which was formed during the company life cycle generated an idea and found a way to implement it.**

Art & Innovation Group develop a strategy to establish the use of alternative eco-product - bags made from recycled paper.

Main advantages of paper bags:

- Recycled paper is cheaper than natural paper;
- They are designed to withstand load up to 10 kilograms;
- Provide weak elasticity: retain its shape during use;
- Advertisement inscriptions are visible for a long time;
- Provide excellent print quality on all types of printing machines;
- They are biodegradable, can be processed and turned into paper.

### **Issues arising**

To establish the use of paper products that meets the European ecological requirements. In this way they will avoid the use of packaging materials from polyester materials. Art & Innovation Group uses economic stimulus to establish the bags. As the advertisers have access to a wide segment of the market and via their advertisement they show socially responsible policy.

### **The outcome**

The company contacted most of the big retail chains and achieved signing contracts for partnership. The eco-product will be offered along with the polyester bags. They plan to sell 200 000 paper bags in the first year.

### **What next?**

Art & Innovation Group's goals are:

- To convince the representatives of large retail chains in the profitability and benefit from the use of such eco-product;
- To "force" the maximum number of advertisers to place their logo on the bags, and thus accelerate the realization of the idea;
- To change public attitudes through extensive marketing campaigns;
- To establish their brand and name of a socially responsible company.

## **5. Conclusions**

The paper presents the experience of the authors with a course -- the "Graduate Student Company", the process of introduction and implementation of the program in a university setting, the lessons learned, and the importance and use of this pattern as a good practice in the teaching and development of entrepreneurship education in the engineering and scientific faculties.

The described pattern facilitated the process of expansion and multiplication of the Graduate Student Company Life Cycle processes from one faculty of Sofia University to 10 faculties and universities and faculties in Bulgaria. The authors anticipate that it will receive a positive feedback and will be disseminated as an innovative approach of learning-by-doing in several European universities and can be promoted and successfully implemented in other universities in the region as well. The participation in the GSC and passing the patterns is an excellent opportunity for students and teachers to meet with executives, innovators, investors, industry suppliers and leading brands of the GSC stakeholders.

The described above cases represent the successful implementation and practices in 2 Graduate Student Companies and show the positive results from this process in Bulgaria.

This, as well as the achievements from the European Best Graduate Student Company

Competition, demonstrate evidence and proof for the value of the current GRADUATE STUDENT COMPANY LIFE CYCLE pattern.

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## **Appendix1. Graduate Student Company Processes**

The stages (in bold italic) and sub processes in the educational process of the GSC are as follows: Identifying ***and involving all stakeholders***. The main stakeholders that have to be contacted and negotiate the future collaboration with them are:

Faculties from leading and diverse fields of science

Consultants from the business community,

Business partners,

Government

High schools and colleges

Clients/employers

***Preparation and Publication teaching materials.*** Before the GSC life cycles start the next teaching materials must be ready:

Teachers Guide

Students Guide

Business Consultants Reference Guides

***Creating demand in the community for this type of learning***

Promotion among the corporate sector

Promotion with the relevant ministries

Promotion in the local communities and municipalities

Promotion with local SMEs and NGOs

***Promotion of the course among university masters degree students.*** The GSC course is elective, according to the curriculum and next activities helps to attract more students to participate:

Joint business academia workshops

Conferences and competitions

Media publications

***Enrolment of the students in the program***

Evaluation of the capacity and competences of the future teams

Company Team building

Short student workshops

***Introduction and presentation of the minds and ends of the student company***

Introduction of the business models

Introduction of the business plan concept

***Defining the organizational model and structure of the company***

Developing mission, vision and strategy

Setting goals and roles of the departments

**ORGANIZATION AND FORMATION OF THE STUDENT COMPANY.** This process is very important and it can be sub pattern of the GRADUATE STUDENT COMPANY LIFE CYCLE pattern.

Choice of an organizational model

Registration of the company

Collecting of initial capital (e.g. through issuing of shares, sponsors, VC, etc.)

Establishment of departments

Selection of product or service

**RUNNING THE STUDENT COMPANY CYCLE.** The process is vital, train students on the subject of practical competences and it can be sub pattern of the GRADUATE STUDENT COMPANY LIFE CYCLE pattern.

Departments work

Department meetings and progress reporting

Company meetings and periodic reviews

Company processes improvement

Exit Strategy

**Closing of the Student Company.**

Departments final reports

Financial report

Liquidation

**Outcome of the work and Results**

Presentation

Evaluation

**Support for the student company members to participate in competitions**

Presentation of previous experiences and learned leassons

Research for different opportunities and competitions

Counselling, coaching, mentoring, and facilitation

**Academic Evaluation and grading of the students**

Test

Public presentation

**Follow-up.** Activities in this stage summarise the experience and go over learning lessons during the GSC life cycle:

Publishing and dissemination of results

Managing the graduate student company social network

**Registration of real companies by the most entrepreneurial students.** The last stage is the most exiting activity of the GSC and finalizes the efforts of the students and they become real entrepreneurs.