BRINGING UP HIGH TECHNOLOGY ENTERPRISES AND ENTREPRENEURS DURING THEIR ENGINEERING STUDIES

CASE: O'SATA ENTERPRISE ACCELERATOR

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Abstract

The O'Sata Enterprise Accelerator is created to promote the connection between the business life and the polytechnic. The pilot field since 1996 has been the high technology in Satakunta Polytechnic in Finland. The aim is to stimulate the transfer of technology knowledge by creating innovative enterprises, each of which is established by a polytechnic student / students. In the beginning of the 2000's there was established 15 high technology enterprises owned by 21 students. The name 'Accelerator' is used because the model differs from the typical incubators.

The aim of this study is to examine the process of O'Sata Enterprise Accelerator, in which the polytechnic student will become an entrepreneur and how efficient this process is to create innovative high technology enterprises in a long term.

Keywords: Engineering education, entrepreneurship, incubator

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1 INTRODUCTION

In Finland the economic boom is very quick. In spite of this the amount of new companies compared with the whole number of companies is one of the lowest ones in the European Union and in the OECD. The amount of entrepreneurs in Finland is 7 % of the working population. In the Europe the corresponding figure is 12 %.

The Finnish social system is still widely based on orders and limitations and it has not been able to create any strong culture of entrepreneurship. It takes much more input to create a viable new entrepreneurship in Finland than in many other countries.

Luckily for us the outlook of Finland is little by little basing more widely on the matters of new entrepreneurship. The post-modern time gives opportunities to it. The increasing competition in the market economy, the wide inside markets of the European Union as far as the high technology and the high knowledge in the country is bringing up the culture of entrepreneurship. Also the public administration is changing its structures in order to develop the necessary conditions for new entrepreneurship.

To increase the amount of new companies in Finland you have to **promote new ways to entrepreneurship and secure continuity of new companies**. Like Europe in Finland about 63 % from new enterprises are living three years after establishing and about 55 % five years.

One of the keys to new entrepreneurship is the education system. The entrepreneurship education is both professional and cultural thing. It means the management of occupational field, such as the integrated and total management of entrepreneurial knowledge and skills as far as the possibility to set up a firm. In a very long term it means that the inner entrepreneurship and even new entrepreneurs shade the whole culture of the education system.

Satakunta Polytechnic has applied new method to start the enterprise already when a student is still running his studies. The project integrates efficient the newest know how of the polytechnic and the business life. It increases high-level students willingness to start as entrepreneurs and brings up new viable enterprises. We call it 'enterprise accelerator'. The term accelerator is used instead of the usual incubator because the concept differs from typical incubators.

The project **O'Sata Enterprise Accelerator** started in the year 1996 and the first enterprise was established in 1997. During these years the Accelerator has concluded 25 co-operation agreements with the students. 21 (84%) of the agreements have lead to start an enterprise. The oldest enterprise is now 3 years old. These companies employ over 40 persons. Most of the companies, it is 15 companies (60%), are working in the field of high technology. The companies of other fields come from business, fine art and social and health care.

In this paper we introduce the model of O'Sata Enterprise Accelerator and after that consider some plans how to study the process to come entrepreneur and the efficiency of this process to create innovative high technology enterprises in a long term.

2 OBJECTIVES OF O'SATA ENTERPRISE ACCELERATOR

O'Sata Enterprise Accelerator aims to create in three years **a working model** in which all 6000 students in Satakunta Polytechnic are so much aware of entrepreneurship and the workings of an enterprise that they are able **to start their own enterprises.** In the Accelerator at least 50 new enterprises brings up in the next three years and they give job for 80 new persons. Most of the students in the Accelerator come from technology, which is up to now the main field to start new enterprises.

The Accelerator:

- promotes to bring up new viable enterprises and new ways to entrepreneurship
- increases high-level students willingness to start as entrepreneurs
- increases the know how to entrepreneurship
- promotes the technology transfer between the polytechnic and business life
- helps to plan and control the growth of SME's
- promotes the networking of companies.

3 STUDENTS' GROWTH INTO ENTREPRENEURS

3.1 Prospects for high technology entrepreneur

There are, at least, three main factors that challenge a student to found a new enterprise. Firstly the new information technology makes potential to new products and services. Secondly technological changes and changes on the labour markets create need for new innovative and high-knowledge subcontractor enterprises. The third factor is due to international competition that makes the large-scale companies to concentrate on the core business and to out-source other activities, such as maintenance and engineering. It must be noticed that in the field of engineering, the question of unemployment is not relevant. The students that are capable of running their own businesses have not any difficulties to find an excellent job.

3.2 Activated Hunting and Development process (AH&D-process)

O'Sata Enterprise Accelerator has developed so-called **Activated Hunting and Development – process** to advice and help a student to become an entrepreneur. In the process students are told about business world, advised in business matters and given a possibility to show their own knowledge and skills even in demanding assignments.

Before setting up their companies students often have taken part in **versatile student projects**, in which a student has good chance to grow into an entrepreneur: new business ideas and the first important clients. The projects are at first small. In there student groups run real developing projects, the projects having real customers and high level of ambition and profession. One of the students is the leader having a full responsibility of the project. The teachers guide and support them. The projects will evolve little by little demanding R&D projects in business life. During the projects students learn to cope with economic risks and they have possibilities to show their skills as entrepreneurs. **Projects mean entrepreneurship at its best**.

The core idea of the enterprise accelerator is to manage the four-stage process[1]:

Firstly it raises for an interested student or a group of students the question of an own enterprise as an alternative. In the first stage the student needs models, debates with various interest groups and experts and facts about the intended business and facts of the resources available in the enterprise accelerator.

Secondly the waked-up process leads to narrow the range of alternatives by imaginative identification of new possibilities. In this phase the role of polytechnic is difficult and demanding. The best guarantee for the polytechnic to succeed is to be up to date in the technology and, on the other hand, it must allow all kind of innovative projects to be run although they will stir the daily programme of the studies. Very important part of waked-up process is R&D projects of Satakunta Polytechnic, which gives many times the idea for the accelerator. Very often the new enterprises are also clients of R&D of Polytechnic.

Thirdly the process leads the student to rearrange his or her studies to meet the requirements of the planned enterprise. On the other words it means matching opportunity and competence. The flexible polytechnic concepts, where every student may have his own, tailor-made curriculum, have an advantage over more bureaucratic ones.

[1] Lähdeniemi Matti, Järvi Anja-Riitta, Piiroinen Hannu: Activated Enterprise as a part of engineering studies, The European Society for Engineering Education, 25 years Annual Conference 1998, Helsinki, Finland, 1998

The fourth stage, which overlaps the others, makes it possible to manage, during the study years, the long process beginning from the first idea, finding the first clients, getting the first references, and ending in an enterprise that gives the owner a competitive wage of living. This is what we call ”acceleration” and it may happen during study years. There is also a clear ”go or no go point”. When the student is finishing the studies, it is time to get his or her living. If the enterprise has not reached high enough level, the owner can give up without a big personal catastrophe. This is possible due to services produced by the O’Sata Enterprise Accelerator.

AH&D –process brings up potential entrepreneurs, innovators, directors of projects etc. With them it is started a **continuous discussing process** to continue students own business idea. In addition to the personality of O'Sata Enterprise Accelerator and senior lecturers of polytechnic other consultants are discussing with the students about their business problems. One of the best mentors is an earlier O'Sata Entrepreneur. After progressing enough, it is made **a co-operation degree** between the Accelerator and the student.

In the next table you can see the volume of students which is caught with the AH&D -process. There are also shown the O'Sata Enterprises, which are taking part in R&D -projects. In these projects also the students of next years are taking part in. They can yet be supposed to be potential O'Sata Entrepreneurs etc.

	2000			**2001**	**2002**	**2003**
Activities to support entrepreneurship	**2. quarter**	**3. quarter**	**4. quarter**			
‘AH&D process to support innovation and entrepreneurship	100% of students	100%	100%	100%	100%	100%
Mentoring for potential entrepreneurs, innovators, project managers	20% of students	20%	20%	20%	20%	20%
Setting up new enterprises	5-10% of students	5-10%	5-10%	10%	>10%	>10%
R&D projects with the O’Sata Enterprises Group	1 enterprise	2	4	6	10	12
International R&D projects			1 enterprise	2	3	4

Table 1: AH&D –process, student projects and intellectual growth in entrepreneurship

4 CREATING FRAME FOR ENTREPRENEURSHIP

In O´Sata Enterprise Accelerator the ignition phase of student's enterprise **takes place along with the studies**. The new entrepreneur's first financial period, when there is no adequate cash flow yet, is a studying phase and the company is viable by the time the polytechnic studies are about to be completed. The company becomes, step by step, as one of the successful enterprises of the economical life and will therefore be a model and a supporter for becoming O´Sata Enterprise Accelerator companies and a potential producer of services to the Polytechnic too.

Students intending to become entrepreneurs are supported by **giving them advice, helping them to make contacts with other enterprises, renting them facilities, equipment, software etc.** The advising process has been told more closely in the chapter before. By developing his /

her enterprise the Accelerator gives the student a possibility to **sharpen the know how** about students own field. If needed the know how can be studied outside Satakunta Polytechnic too.

In Finland there are **risk financiers** to some extent, but they are operating with 'great money'. O'Sata Enterprise Accelerator is working to get they keen on new SME's and their small needs for money too.

All the time the Accelerator is working together with other business advise organisations in the county. With help of the Accelerator a student entrepreneur is early able to take part in different important networks. **The national and international networking** in different sectors are important for the Polytechnic and the O'Sata Enterprises.

O'Sata Enterprise Accelerator is at this moment taking part in **an international training program to manage the incubators.** The aim is to estimate the situation of the Accelerator and make a plan to develop it. Furthermore O´Sata Enterprises Accelerator is taking part in **an EU - program of incubators, which is arranged by the University of Turku.** Here the aim is to 1) create a process to estimate the incubators so, that you are able to compare Finnish incubators with the international ones creating good measurements, 2) test the process in different incubators, 3) create in Internet a process for self-valuation of incubators and 4) teach the managers of incubators to use the self-valuation process.

In order to manage with viable entrepreneurship the polytechnic must chance its culture and course of action. The Accelerator realised in 1998 a self-valuation with the University of Jyväskylä, in which valuation it was studied the situation to bring up entrepreneurship in the Polytechnic. Now a process is starting among the staff **to make the culture more suitable for making business**. The aim is to create an enterprise-friendly study environment. It must be possible to study and to be an entrepreneur at the same time.

To manage in this process the students, teachers, administrative staff of the Polytechnic as well as the persons in the economic life has to **commit strongly to entrepreneurship.** The most important things to commit are shown in the next table. (Table 2).

Partner of accelerator	**Requirements for commitment to entrepreneurship**
Teachers	- understand changes in working culture in polytechnic - give students views instead of traditional teaching - co-operate with business life - understand ‘inner and outside entrepreneurship’ - commit to entrepreneurship - care students also after finishing their studies - alumni working - be able to advice students to manage with their real enterprises
Students	- understand changes in working culture in polytechnic - adopt changes in studying culture in polytechnic - understand ‘inner and outside entrepreneurship’ - be able to manage with a real enterprise - control ones life with help of entrepreneurship / his own enterprise
Administration of Polytechnic	- understand changes in working culture in polytechnic - be flexible and quick in making decisions - no more bureaucracy
Co-operators in business life	- understand changes in working culture in polytechnic - act as co-operators with students - students’ enterprises can be a supplier, a customer or it can ‘be in the markets’ - advise entrepreneurs - ‘hiding knowledge at the grass-roots’ - promote networking in field - invest in our enterprises and in accelerator too

Table 2. Requirements to partners of accelerator for commitment to entrepreneurship

5 RESEARCH PLAN

O'Sata Enterprises Accelerator has already shown that these micro-sized enterprises **are an important actor to rich the economic life of the county**. The bigger companies, which want to out-source their operations, get good co-operators from O'Sata Enterprises. The young entrepreneurs are innovative and eager and they have **the newest knowledge** of their own professions. Naturally the tight connection with the Polytechnic is a guarantee of the knowledge. Like the words of one O'Sata Entrepreneur: "The knowledge does not come to an end."

When analysing the birth of these enterprises, some conclusions can be drawn. Active co-operation with economic life during study-years, all kind of projects and especially the final year R&D project are positive factors in giving the business ideas and to find and to convince the first clients or partners. Also the help of O'Sata Enterprise Accelerator is much better now than in the first operative years**. The model is coming all the time more viable and the quality has improved too.** All this is seen in the workings of the O'Sata Enterprises.

Until now there has not been carried out any large research in the Accelerator. So empirical data has not yet been collected very much. Now the amount of enterprises begins to be great enough to do this. A student is at this moment making her thesis, in which we can get information form the entrepreneurs, their backgrounds, most difficulties in their enterprises, the best things etc.

In this study the aim is to carry out research into the process of O'Sata Enterprise Accelerator - the process to come entrepreneur and the efficiency of this process to create innovative high technology enterprises. We want to know if there is any addiction between a successful growth process into an entrepreneur and his / her enterprise - is the enterprise in that case highly successful too?

The next figure will show the main parts of the research process.

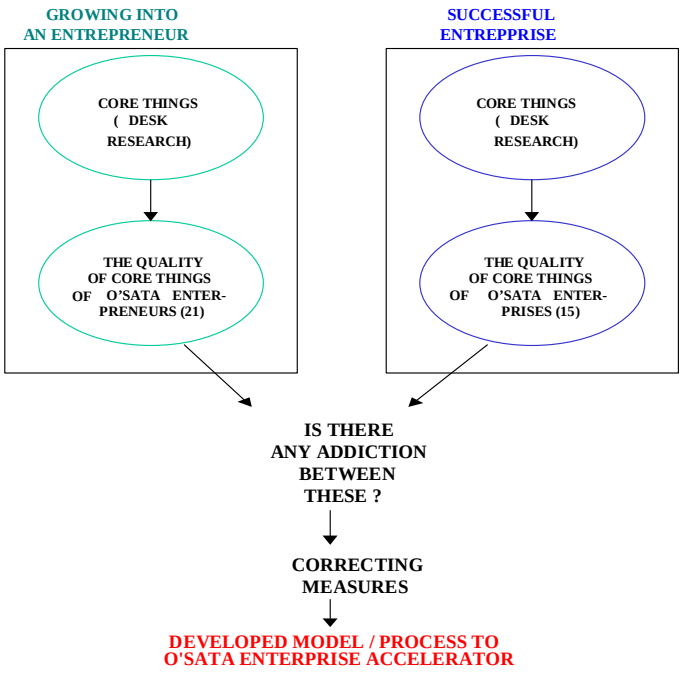

Figure 1. The research plan of O'Sata Enterprise Accelerator

The research stages of O'Sata Enterprise Accelerator process (high technology):

1) Defining the core things in growing an entrepreneur in the Accelerator
   ➔ measuring the quality of these core things of O'Sata Entrepreneurs (21 persons)

2) Defining the core things of a successful enterprise
   ➔ measuring the quality of these core things of O'Sata Enterprises (15 enterprises)

3) **Is there any addiction between a successful growth process to an entrepreneur and the success of his / her enterprise?**

   ➔ **The developed process / model of O'Sata Enterprise Accelerator**

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