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**PARTICIPATION OF GRADUATES STUDYING MANAGEMENT  
IN SCIENTIFIC PROJECTS: BENEFITS AND PROBLEMS**

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*Abstract*

The quality of the Master thesis developed by the students of the Entrepreneurship and Management to a large extent indicates the quality of knowledge, the level of skills and abilities of the graduates. In the article we consider our experience in supervising students' participation in the research projects and development of Master theses. Our analysis shows that participation in the scientific projects, parts of which become key research presented in the Master thesis, can substantially improve knowledge and research skills and abilities of the students, increase the quality of research and Master thesis per se and provides tangible benefits to the university and to the supervisor.

Present research provides the analysis of the benefits gained as a result of graduates' participation in the scientific projects as well as the analysis of the problems faced by the supervisor and the student such as insufficient level of knowledge and skills of the graduates or the necessity to reconcile the research topic with the study program. We also focus on the tasks, which most likely can be delegated to the students when involving them in the applied scientific projects. The results assure that the potential benefits received by the parties involved outweigh the headwinds faced by professors and the students when participating in the applied scientific research.

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**Keywords:** Scientific projects, applied research, master thesis, management and entrepreneurship, personal and professional development.



## 1. Introduction

Modern education is characterized by a trend of involving students as much as possible into the interactive practical activities, which include also scientific work (Alberts, 2009). Participation in the research with active involvement of the professors can enrich students with valuable experience (Kuh, 2008). The researchers note that in the process of students' participation in scientific work they enjoy the tailwind in personal and professional development (Hunter et al., 2007). This process takes place outside the traditional training of students in the classroom (Burks, Chumchal, 2009). For the graduates, this model of participation in scientific activity can become an "open door" to the real world of science (Patterson, 2007). Students involved in the undergraduate research were admitted to demonstrate significant improvements in the ability to think analytically and logically, put ideas together and to learn independently (Ishiyama, 2002). Bauer and Bennett (2003) pointed to the increased satisfaction of the students being involved into the research, while also to the increased curiosity and enhancement of the research and communication skills. Gilmore et al. (2015) agree stating that participation of students in scientific work strengthens their research skills, these students also receive higher scores.

Walkington (2015) in her monograph states that students' involvement in the research should be included in the curriculum as it increases students' and professors' involvement, while also increases research culture in the universities. Active learning or learning on the job has been always efficient, that's why Jenkins and Healing (2012) strongly support including research in students' curriculum.

In some cases, professors do not have enough spare capacity for conducting the scientific work and / or to ensure its high quality (Hunter et al., 2007). Besides, the plausibility of the obtained results to a large extent depend not only on the qualification of the supervisor or the student but also depend on the amount and quality of the material gathered, which usually has to be collected in a relatively short time period. And then the cooperation between the student and the professor become vital for both sides (Shmuratko, 2014). She states also that a very important part of the research depends on "the databases, coding, formalization and primary processing of the results of empirical research. Incidentally, a few students very often demonstrate a higher level of computer literacy than many older scientists. A student's intuitive knowledge of today's information technologies, his ability and desire to work with computer equipment, make him desirable performer of tasks at the stage of the presentation of empirical data in an electronic format. It is important to note that in a vast majority of research we see "statistical processing of the data".

As a result of participation in scientific projects, Master student receives specific scientific results that can be used to write course papers, theses and future dissertations, as well as an understanding of the organization and implementation of scientific research, the selection and analysis of empirical data, and knowledge in the preparation of publications.

The ready-to-use scientific results are important enough in the context of the fact that many graduates in Latvia not only study but simultaneously also have full-time job. Therefore, the participation in the scientific projects not only benefits the development of the students but also succeeds time saving when working on the Master thesis. Besides, substantial help is guaranteed from the supervisor side as the professor is being responsible for the project results. This approach encourages students to feel the taste

for the research per se and continue their career entering doctoral studies, while their Master thesis becomes the basis for the dissertation. |

## **2. Problem Statement**

|Master Thesis development and defence is the final stage of the Master studies. The quality of the thesis to a large extent is determined by the level of knowledge, skills and abilities that a student receives when graduating from the university. By involving graduate students in the projects, in which his/her supervisor participates (or plans to participate), one can substantially improve the quality of the Master's thesis and the level of knowledge, skills and abilities obtained by a Master student in the process of developing thesis. The article provides the results of involving the students, whom we supervised in 2016 and 2017, in the applied scientific research projects, the findings of which became a certain component part of the Master thesis research produced by the student.

A number of problems are associated with recruiting the students for the scientific project as well as with organizing their work afterwards for the project to become as efficient as possible. Not only is skilled and knowledgeable student required but also the ones who exhibit high motivation for participation in scientific research. Only in this case the cooperation and the result can be successful.. |

## **3. Research Questions**

|The authors consider a number of research questions in the present paper:

1. What are the benefits of involving students in the applied scientific research projects received by the parties involved and whether the benefits are outweighing the problems associated with the process?
2. What are the headwinds faced by the parties involved?
3. Based on which criteria should be selection process of the students be built on?
4. What are the typical tasks, which can be reliably delegated to the Master students?

When referring to the parties involved, primarily we mean students, university and supervisors of the Master thesis, who often tend to become initiators of the scientific projects.|

## **4. Purpose of the Study**

|The main purpose of the present article is to identify the benefits and potential problems, to analyze the process of involving the graduates, who are developing their Master thesis, in the scientific projects, to disclose the potential tasks, which can be reliably delegated to the students. Besides, we aim to share our own experience of supervising the students in the process of developing their Master thesis while also participating in the scientific projects. |

## 5. Research Methods

The research is conducted based on the descriptive multiple-case method. The authors built their arguments based on six cases, when the students, who were developing their Master thesis, have been also involved in the applied research projects in academic years 2016 and 2017.

## 6. Findings

### 6.1. Sources of origin and topics of the applied scientific projects in Management and Economics

Supervisors of the Master thesis are usually the ones, who initiate the scientific project in cooperation with the state institutions and agencies as well as private companies, which often lack capacity, knowledge and experience in conducting research. Ministry of Economics, Statistical Bureau, Development Agency etc. or industry associations might become the idea generators. During 2016 and 2017 we have undertaken the research initiated by the Ministry of Economics of Latvia, the Latvian Chamber of Commerce and Industry, Certus think tank, Latvian Venture Capital Association (LVCA), and Latvian Business Angels Network (LatBAN).

The topics of the researches mainly cover various problems regarding the industrial specialization, tax system, entrepreneurship and others, which are related to the specific aspects of the development of the national economy and entrepreneurial activities in Latvia, relevant in the short and mid-term. Limited size of the projects allows us to carry out several projects a year, involving few professors and 1-2 Master students and / or Doctoral students. Our experience indicates that when involving Master students in scientific projects supervisors have to be much more dedicated to the process of the students' supervisions and their skills improvement. Specifics of the process explains limited number of the Master students, which are supervised during the academic year.

### 6.2. Selection process (and criteria) of the Master students for inclusion in the applied scientific research projects

We primarily choose the potential colleagues to undertake the project from the groups, where we have lectured, so that we have sufficient understanding of the preparation level of the graduate to involve him/her in the scientific project. Besides, we involve the students, who were recommended by colleagues or students knowing the recommended graduates.

The following criteria are of the outmost importance when selecting the candidate for participation in the applied economic research projects:

- Readiness of the student to develop a Master thesis on the topic proposed by the supervisor.
- Willingness and ability of the graduate to spend on the preparation of a Master's thesis not less than that it is stipulated by the study program (ca. 560 academic hours).
- Desire and readiness of the student to improve his/her skills in research methods, gain experience and knowledge related to the goals and objectives of the study in the process of preparing Master thesis.

- Sufficiently high general level of student's knowledge.
- Master student's ambition to develop an excellent paper, develop his skills and knowledge in the relevant area, get experience in applied scientific research.

It does not mean that we reject supervision of the Master students during the development of their theses in case they do not meet the criteria listed above, but it means that we consider it inappropriate to involve these graduates in the applied research projects.

### **6.3. Main tasks delegated to the students during their participation in the projects**

Below we list possible tasks, which can be reliably delegated to the graduates. These tasks do not demand significant portion of guidance from the supervisor's side and can be performed relatively independently, which increases the efficiency of the project performance.

- Participation in the survey process, which includes also the design of the survey, collection of the questionnaires, data processing.
- Statistical data gathering and processing.
- Project's topic related literature review covering both the theoretical foundations and empirical experience.

Naturally, these tasks are being performed under the supervision and the students receive constant feedback, which is vital in this process as it helps student to learn, get experience, enrich knowledge in the particular field, improve analytical skills and abilities when analyzing the data and the scientific articles.

### **6.4. Assistance and feedback to the graduates**

Usually supervisor to a large extent supports the student when he or she develops the thesis. However, in case of involving the student in the scientific research, the methodology and findings of which later become parts of the thesis, the time and capacity supervisor dedicates increases several times. The typical examples of supervisor involvement:

- In-depth participation in creating a master's thesis design and research methodology.
- Provision of valuable data sources and in several cases also financing the purchase of the data required for the research.
- Guiding on information and statistical data search.
- Strengthening the knowledge of undergraduates in the methods of research and data processing.
- Assistance with the necessary access to the potential interviewees and questionnaire respondents in a more professional (expert) environment.

### **6.5. Benefits to the graduates**

Though undertaking a scientific project and involving there students in a most efficient way, creates a win-win situation, perhaps the main benefits are harvested by the graduated him/herself. Below we mention the most obvious benefits for the Master student:

- Enhancing knowledge and experience in understanding the principles and methods of research, data collection and processing.
- Possibility to prepare a Master/Doctoral thesis using research data obtained and processed for the scientific project purposes.
- Opportunity to contact the scientific supervisor or research team members and get feedback more often than it is stipulated in the regulations on the supervision of the Master Papers.
- Experience in the preparation of scientific publications.
- Development of Master thesis of higher quality. For instance, more than half of the theses developed under our supervision can be considered as the basis for a doctoral dissertation.
- Self-assessment and the feedback from the supervisor regarding the inclination of the graduate to the scientific work, including the assessment of the appropriateness of undertaking the doctoral studies.
- Valuable experience of the teamwork in the scientific project.
- Valuable contacts in the academic field.
- Possibility of additional income receipt from participation in the project, in case it is commercial.
- Possibility to further develop personal brand in science and pedagogical activity, which is of the utmost importance for the career building and knowledge dissemination in the era of marketing and branding (Scheinfeldt, 2009). Personal brand is required for the perception by the colleagues in academic field and that perception is later being turned into opportunities (Montoya, Vandehey, 2002).
- Graduate, who has gained experience in the projects without entering the doctoral program immediately after completing the Master studies, might be interested in continuing participation in the applied scientific research and producing scientific articles, which allows him/her not to lose his competences and improve his scientific qualification, which is of the utmost importance in case the person later considers pursuing career in the academic field, analyst or consultant.

The most important for the student naturally is the supervisor's support and feedback, which can be valuable not only from the academic research side. Additionally, a student in such collaborative phase receives also psychological support, advice on career path and goal setting (Gershenfeld, 2014).

#### **6.6. Benefits to the professors, supervising Master theses and students' participation in the scientific project**

Professors conducting applied research are able to make the process more efficient when involving graduates. First, it provides additional flexibility as it is easier to build a project team for a less complex part of the research, especially if there is shortage of faculty members that are prone to research. Second, it might increase the quality of the research and decrease the time allowance as the students might possess necessary skills, which the scientific supervisor lacks. Third, it might be beneficial from the financial point of view - in case the project is commercial, the expenditures might be decreased. Besides, the spill

over effect of involving the students in scientific projects would be the enhancement of the skills, abilities and knowledge of the graduates.

### **6.7. Benefits to the university**

University serves as the network platform where the supervisor and the student meet to conduct the research. However, the benefits enjoyed by the university as the spill over effect are rather tangible:

- Improvement in quality of Master and Doctoral students' knowledge and skills through the applied research in accordance with the interests of the national economy.
- Opportunity to participate in more projects and as a result authorship of larger quantity of scientific publications can be claimed.
- Probing the inclination of the graduates for scientific work in order to increase the number of potential candidates for admission to the Doctoral studies (and the allocation of the scholarships in the Doctoral studies).
- Increasing experience of Master and Doctoral students in applied research, which is having real value in relation to the national economy.
- Building university's reputation as the provider of the education with real value. As a result of the involvement of Master and Doctoral students in the scientific projects, the popularity and rating of the university increase, as well as the university's contribution to the training of highly-skilled specialists for the national economy. Additionally, students' active involvement in the academic environment stimulates creation of the "young" reserve for teaching and research work.
- "Building" the reputation of the university in the society as a "producer" of the trustworthy research results, which are vital for the sustainable national economy development.
- There is an increase in the number of projects where university acts as an academic partner. It obviously can play a positive role not only in the form of additional payments to the professors for participating in the scientific projects, but also it might substantially increase the university's revenues.
- Creating a more attractive environment for the professors, who are prone to scientific work.

### **6.8. Problems faced during participation in applied research projects**

When involving the graduate in the applied research project both the student and the supervisor face the headwinds, the majority of which are being tackled by the supervisor him/herself:

- Insufficient level of students' theoretical knowledge and skills in application of the research methods, including statistical analysis (factor, cluster, dispersion and regression analyses).
- Insufficient level of skills in data search and processing and/or analysis of the scientific literature and sources, where one can obtain the necessary scientific articles (including

ignorance of databases and scientific networks such as Google Scholar, Research Gate, RePEc and SSRN).

- Necessity to coordinate the research topic with the program where the graduate studies.
- A limited number of graduates, who would have the necessary level of knowledge and skills in compliance with our criteria for participation in the applied scientific projects. Or, they might not be ready to choose the supervisor's proposed research topic as the theme of their Master thesis.
- Absence of orders for applied scientific research or absence of the financial support for the specific project in the period of Master thesis development. |

## 7. Conclusion

|Applying the method of participation in applied scientific research projects to improve the qualification of the Master students and to support them in their Master theses development, we have gained successful results for two academic years (2015/2016 and 2016/2017), which we share below. Overall 6 Master theses have been developed during the mentioned period on the topics of the foreign direct investment, venture capital investments, microenterprise taxation. The average score of five (one thesis is pending for defence) graduates for the defence of their Master's papers was 9.6 (excellent/with distinction), which supports the Gilmore et al. (2015) statement. Two of six graduate students entered Doctoral studies, while three more graduates are likely to enter Doctoral studies.

The feedback from the students, which have been supervised, is very positive as they report that their participation in the scientific research and therefore, increasing their qualification and practical knowledge helps them to build and develop their career in the private sector.

We, as supervisors, and graduate students, who participated under our supervision in the applied scientific research, find that the method of students' participation in the applied scientific research project, which complies with the topic of Master's thesis, significantly increases the knowledge and skills of the students. It also positively influences the creation and promotion of the personal brand of the graduate. Students' participation in the applied scientific research has a significant positive impact on the understanding of the essence of scientific work and the evaluation of the Master's thesis, expands the scientific capabilities of research teams and universities in terms of the number of applied research and publications. It is an efficient way of encouraging students to proceed with the further education and development. It can be assumed that former graduate students who took part in the applied scientific research have a higher probability of obtaining Doctoral degree than Master students, who did not take part in the applied scientific research. |

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## Appendix 1

### List of graduates who participated in scientific projects on the topic of their Master thesis

	Master student	University	Year of defence	Master thesis topic	Grade	Prospects for admission to Doctoral studies
1.	Daria Ten	TSI (Transport and telecommunication institute)	2016	Research of organizational and financial stages of setting-up of young innovative companies with fast growth potential before seed financing.	10	Considers entering Doctoral studies
2.	Velta Jonina	RISEBA University	2016	Analysis of Latvian venture capital funds investment structure by industry	9	Entered Doctoral studies immediately after receiving Mg. oec.
3.	Andrei Davydovitch	RISEBA University	2017	Project selection criteria for business angels' investment	10	Entered Doctoral studies immediately after receiving Mg. oec.
4.	Vitauts Budriks	RISEBA University	2017	Evaluation of the efficiency of enterprises with participation of foreign capital	9	Considers entering Doctoral studies
5.	Jekaterina Azarkevicha	Riga Technical University	2017	The assessment of impact of foreign direct investment on a company's performance in Baltic countries	10	Considers entering Doctoral studies
6.	Yuliya Eremina*	Riga Technical University	2017	The Evaluation of Microenterprise Tax Regime Efficiency in Latvia		

\*Yuliya Eremina is planned to defend later in 2017