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## INNOVATIONS IN MARITIME RESEARCH THROUGH CO-OPERATION BETWEEN UNIVERSITY AND EMPLOYER OF THE STUDENT WRITING HIS/HER MASTER THESIS

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**Abstract.** Satakunta University of Applied Sciences started a Master's programme for bachelor level Master Mariners 2006. The idea of this Master of Maritime Technology program is to produce leaders, experts and researchers for the maritime industry with a seagoing background of at least three years. The studies consist of 60 credits and half of this is research work partly for the company and partly for the University – Both of which are engaged in the process.

After nine years of experience from this practice there is now a great deal of best practices to be presented. As a result we now know what works in practice and what does not work. The idea of the article is to present best practices of the research methods and guidance methods in practice. The idea is also to present some results of the research conducted by the students.

An investigation among the graduated students has been done on how they were served by the University during the process of research, how they were encouraged or discouraged by their companies or fellow workers etc. But most important is to envisage how the results of the research work benefited the employing shipping companies and the employee. These results concentrate on maritime safety and efficiency as they have been the topics, which have been recently encouraged to be researched by the shipping companies.

The roles of companies and University in promoting the students research are analyzed. The first results show clear differences in the attitudes of different shipping sectors and different market areas. The students in this program work in multinational companies but the research show clear differences also in the attitude of different nationalities in research and how efficiently the company uses its opportunity for free research and co-operation with the Universities.

Research results presentation methods are presented and analyzed. Companies and University have experimentally organized seminars to present the research in different stages at the University with a possibility to participate also from the Shipping company's premises.

**Key words:** research in MET, logistics and management, safety, efficiency, human element

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## 1 LEADERS, RESEARCHERS AND EXPERTS FOR THE MARITIME INDUSTRY

The idea of the Master of Maritime Management program is to produce leaders, experts and researchers for the maritime industry with a seagoing background of at least three years. The demand of minimum three years working experience is regulated by legislation relating to the Act on Universities of Applied Sciences in Finland. This regulation is the starting point for the Master studies and how they are combined with the Bachelor studies. Each student in general is allowed to apply to master studies only after three years has passed since the graduation from the Bachelor level. For the maritime management program the working experience from seafaring after bachelor studies is an extra requirement included in this three years.

As the bachelor level degree is regulated by the STCW-convention, the level of the student's abilities after graduation from bachelor level Universities should be equal. The students should at least have the same basic knowledge when they apply to the master program.

The Master studies consist of 60 credits and half of this is studies essential for the persons who want to work in a shipping company or in the maritime administration. Master programs idea is to form "bridge" from ship to shore and give the required information on top of the STCW topics, which have already been taught to the student previously. The idea is that there has to be a main thread in the studies in a way that the master program starts from the assumption that all the STCW topics have already been handled and also held updated. This is essential as there is only 30 credits which must be effectively used to built the expertise needed in land based organization. Therefore all the 30 credits have to be used effectively and they do have to support also the research work that the student will do as half of the studies consists of research work partly for the company and partly for the University – Both of which are engaged in the process.

## 2 RESEARCH AND GUIDANCE METHODS IN PRACTICE

Satakunta University of Applied Sciences (later SAMK) started the program nine years ago and after nine years of experience from this practice there is now a great deal of best practices to be presented. The studies consist of 60 credits and half of this is research work partly for the company and partly for the University. Studies are designed in a way that persons who are working beside their studies can complete them in 2-2,5 years, but studies can also be completed

as full time study basis in one year. The system of studies is planned to combine the work of two groups, which start every second year. The best students in previous group present the results and research methods of the previous group to the following group, which is in their first year of studies. This is combined to the alumni activities formed by the previous groups. In the following I will explain the method using the 2014 group as reference.

The study group selected during the autumn 2013 started their studies in January 2014. The first months the students were learning shipping organization methods and in depth shipping economics. The two courses gave them in more updated knowledge of the last developments in law, economics and practice concerning the working environment internationally. In the beginning of the studies the basic research skills were also presented. In May 2014 the previous study groups best research results were presented for the new students and their employers in a one day seminar organized by the Satakunta University of Applied Sciences together with the ministry of transport and communications in Finland, whose employee had also participated in the previous study group.

The core idea of this practice is to bring together the students, which are in the beginning phase of their studies, the graduating students and the alumni – together with all their employers. The seminar is organized to fulfill several different goals in mind. First of all it is important way to bring the new research works to the knowledge of all employers. Secondly it is organized for the students and alumni's so that they can network with each other and all the most important employers and possible future employers, which are not just national but also international shipping companies not just from Nordic countries but also from further afield. Thirdly the research work presented is gathered as a publication, which benefits all participants. Fourthly, the students who are now in the beginning of their studies are able to hear concrete stories of how the best students have conducted their research work together with their employers and the University, how they have planned and targeted the research work, what difficulties they have had and how they have won the difficulties, where they have found guidance and how they have finally reached their targets.

This has been essential for them for their own research and helped enormously their own research process, as they have been able to make more concrete planning of the research in an early stage of their studies when they already have a some kind of idea of their research topic. Finally as the seminars have ended by a dinner and cozy evening spent together with the students and the alumni's, they have been able to network

and informally discuss the possible research topics and hear more experiences from the alumni's.

During the next summer the study group developed their research topics and in the first seminar they present each other the research ideas and the research method, which is then discussed together with the Lecturer and fellow students. After this the employer and University sign the contract together with the research plan and the actual research will start. The roles of the student, Lecturer and the employer are prescribed in the contract and the research plan, which also determines the schedule according to which the research will be conducted. The second seminar is organized when the student has collected his research materials and in that seminar he presents the materials to the fellow students and also presents how he is going to apply the chosen research methods to the materials. Also an important part is planning of the research work in general and how it will be combined with the other studies during this phase of research in order to create a symbiosis in which they support each other. Roles of the persons guiding the student from University and the employers are also in this phase more closely determined.

### 3 EMPLOYER ROLES IN RESEARCH

The roles of companies and University in promoting the students research are crucial. They need to understand their role clearly since the beginning of the process. The results of the analysis show clear differences in the attitudes of different shipping sectors and different market areas. Many of the students in the study program work in multinational companies but the research show clear differences also in the attitude of different nationalities in research and how efficiently the company uses its opportunity for free research and co-operation with the Universities.

The Cruise shipping sector has been this far the model student in understanding the how to benefit from the students and University's efforts to create new knowledge through research. The example from Germany concerning creation of Cybernetic model of the bridge environment of a cruise vessel is the best example of how the company can respond to the needs of the industry by participating to the process in a way that benefits every aspects of the research. This can therefore be used as a model example of the process.

In the beginning of the process the student only had an idea of a serious of topics in mind when he approached the employer. His idea was to increase safety by combined with the workload at the bridge. After contacting the employer he received some topics, which the employer represented. In the same occasion

the employer also presented how he would make the time available for the student if one of the topics would be chosen. After the topic was chosen the employer presented a person in the company responsible for the guidance from the employers side and arranged a starting meeting between the employers representative and the student. In this meeting the employers representative gave the student a list of materials which could be used in the research and also some basic knowledge material as a starting package. The University's appointed lecturer then supplemented the list. After the student was well aware of the theoretical knowledge he was offered first one and then several vessels bridges for his the experiments of how the model would increase safety in practice. The analysis from this phrase was then taken to the study and the results were fully implemented in shipping company practices afterwards.

Another model example - actually two - from a same stevedoring company can be named in the same occasion. Finnish stevedoring company Finnsteve Ltd. Also understood in the very beginning that the employees participating the study program could really make a valuable effort. The first one was a study on reorganization of working time in the biggest Finnish container port, which had suffered of inefficient practices for decades. Mainly as a result of the study the practices were renewed and as a result the "lock" creating by the unions in the 1970's were abolished.

The other example from the same company was a preliminary study for a new terminal management and container load planning system in Finnsteve Helsinki Vuosaari terminal. The result was also usable product for several different ports used by the shipping company in different countries and created work for tens of people in planning.

The essential feature in both these two researches were that they were closely negotiated with the University representative and the company together with the student in the beginning of the process and which was carefully planned starting from the outcome.

Two more examples can be taken from the Maritime administration. An excellent research was conducted on Safety of a vessel during sea trials. This research revealed that the process of sea trials lacked the legal framework totally which led to serious problems in variety of practices. The starting point was however different. The whole research idea was already based on the findings of the student in his own profession. The whole studies were used to collect different applications on different side effects of lacking ship safety and collected to the theoretical part of the study. During the empirical part of the study the student was present in the whole process of three different kinds of vessels sea trials and gathered the problems and deficiencies.

The resolution was that there should be common legislation for the industry for the European level to solve all the problems without giving the competitive advantage for the other countries shipbuilding industry.

The other research from the student working in maritime administration revealed the problems for the industry in facing the new Marpol air pollution requirements. An excellent example of combining the cooperation in research by the industry representatives and the administration by a person who had been previously employed by the shipping industry organization and thereafter ministry transport and communication and now after graduation a permanent representative of Finland in IMO.

#### 4 CONCLUSIONS

To summarize, the study program, which consists of studies combined to research has proved useful for both the students, companies, administration and the University of applied Sciences. It has fulfilled every participants need in a coherent manner and found its place to support the industry. It creates leaders experts and researchers a planned originally since 2003. All the model examples mentioned have moved upwards in their careers soon after graduation. They have either moved upwards in the same organization or to new organizations – but all have received more demanding posts as in the management. A research conducted among the alumniees in the beginning of this year gave significant feedback – All the students

had experienced the studies useful and answered that they had been able to use their new expertise in their new positions. The first student was accepted to take the doctoral degree in WMU in Malmö last year without any supplementary studies – As result, which can be considered appraisal for the methodological skills served by the University of applied sciences in the masters program.

However, the most important result is that the research conducted by the students is constantly used to enhance maritime safety and efficiency of the industry when the result are implemented to the work in shipping companies and maritime administration.

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