

A Study of Social Networks for Maritime Education and Training

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ABSTRACT: This study analyzes the role played by social networks in maritime education and training. The objective of this study is to investigate the shortage of seafarers in maritime global transportation, as mentioned by the BIMCO. The authors divide the processes of maritime education and training into two categories: "Maritime educational institute" and "Maritime Company." These are not systematically connected but are found in the processes between social networks; it has the social networks to both. Therefore, teaching staff members, in their roles as job advisors in "Maritime educational institutes," use social networks in conjunction with "Maritime companies." The teaching staff members communicate with students using these processes. The teaching staffs are the carriers in regard to how these processes are related. This study surveyed aspects of "personality" and "social networks" pertaining to teaching staffs and quantitatively analyzed the processes related to social networks.

1 INTRODUCTION

BIMCO and ISF study the supply and demand for seafarer human resources once every five years. The research report "MANPOWER UPDATE" has been shown to be the most comprehensive assessment of global supply and demand for merchant seafarers available. They have two purposes. The first is to describe the current worldwide supply and demand situation with regard to seafarers. The second is to make predictions about the situation 5–10 years in the future, in order to assist the industry in anticipating changes and taking appropriate action. The aforementioned report has been constantly updated since 1995, when evidence was found of a significant shortage of officers.

Maritime educational institutes have a social mission to supply maritime experts to consumers (i.e., maritime companies). Additionally, suppliers and

consumers need to exchange information for the employment of maritime experts. However, this communication requires a relationship (social network) between the supplier and the consumer. Investigation of the status of these social networks in maritime educational institutes is very important with regard to the supply of human resources.

The objective of this study is to quantify the current status of social networks used by maritime educational institutions for communication with companies. This study explores the factors that affect social networks.

2 SOCIAL NETWORKS

2.1 *Social networks*

A social network is a concept of virtualized relationships between actors in social science. It is able to confirm the interrelationship between individuals, organizations, and groups. Putnam (2000) made several important statements on social networks. He classified the aforementioned relationship into three main factors: "Network," "Trust" and "Precept."

Granovetter studied the problems with social networks in 1973. His study clarified that a function of social networking is to facilitate job seeking. Public and private outplacement services as well as "introductions" and "personal connections" affect the motivation to change jobs. Granovetter revealed that in the U.S., successful job change is facilitated through "strong relationships" with the family, relatives, and close friends (Granovetter 1973).

Burt (1992) analyzed the network structure of brokers. Brokers (mediator) have two activities. First, they find the gap in the network that does not exist in the relationship. Second, as mediators, they control the flow of information and resources. Burt argued about the benefits of connecting weak relationships and no relationships.

To determine the social value of an organization, must study the situation with regard to its social network.

2.2 *The human resource supply chain in Maritime Education and Training*

Supply Chain Management (SCM) is a product supply concept that is used in production management of industry. SCM is a set of process flows from procurement of raw materials, to production, to shipping, to sales. Another definition of SCM is provided by the APICS Dictionary: "designing, planning, executing, controlling, and monitoring of supply chain activities with the objective of creating net value, building a competitive infrastructure, leveraging worldwide logistics, synchronizing supply with demand and measuring performance globally." There is a production process for not only general products but also human resources for seafarers. Therefore, Maritime Education and Training (MET) can be divided into several processes using the concept of SCM.

MET can be classified into two main processes: "Maritime educational institute" and "Maritime company." The "Maritime educational institute" process is a process for gaining specialized knowledge and technology for becoming a seafarer and maritime expert. Maritime universities, colleges, and technical schools are classified under "Maritime educational institute." Maritime educational institutions train students using theoretical and practical methods with the aim of cultivating maritime experts. Students have to make a concrete decision about whether they want to become

seafarers, work in the maritime industry, or go to a higher-education institute during this process. The "Maritime company" process is the process of working in a company (e.g., shipping companies, shipbuilders, maritime industries).

2.3 *Gap between processes*

This study examines the macroscopic maritime educational process for maritime experts. However, it does not have strict integrity; these processes are individual and independent. Therefore, there is a gap between each process. A social network needs to complement these gaps. Therefore, each process requires cooperation based on common goals and interests. The common goals between "Maritime educational institute" and "Maritime companies" are job seeking and recruiting.

2.4 *Personal social networks in a process*

To communicate is necessary the relationship that is either already having a social network or connecting a new relationship. This is similar to communication with individuals, organizations, and processes. Individuals and individual members are working in these. To social network of the organization replaces personal social networks. Figure 1 indicates the relationship between a school and some companies. It is assumed that there is already a relationship between the school and the companies. It is clear that the relationship between organizations or groups is an "apparent" relationship. However, the relationship between the staff of the school and the company is a personal or "real relationship." All members of organizations have their own personal social networks. It is possible to determine the social attractiveness of an organization by learning about the personal social networks in an organization.

3 SURVEY

3.1 *Defining keyword*

In this study, we define a personal social network as the social network of an organization. Additionally, two factors that affect personal social networks are reviewed: quality and quantity factors.

3.1.1 *Teaching staff personality as quality factor*

Teaching staff members tend to have a wide variety of backgrounds proportional to their age. This background is the career experience of working. Age affects life experience. "Career" can be classified into two main groups: educational career at an academic institution, and professional career in a company. The author refers to age and career as "quality factors."

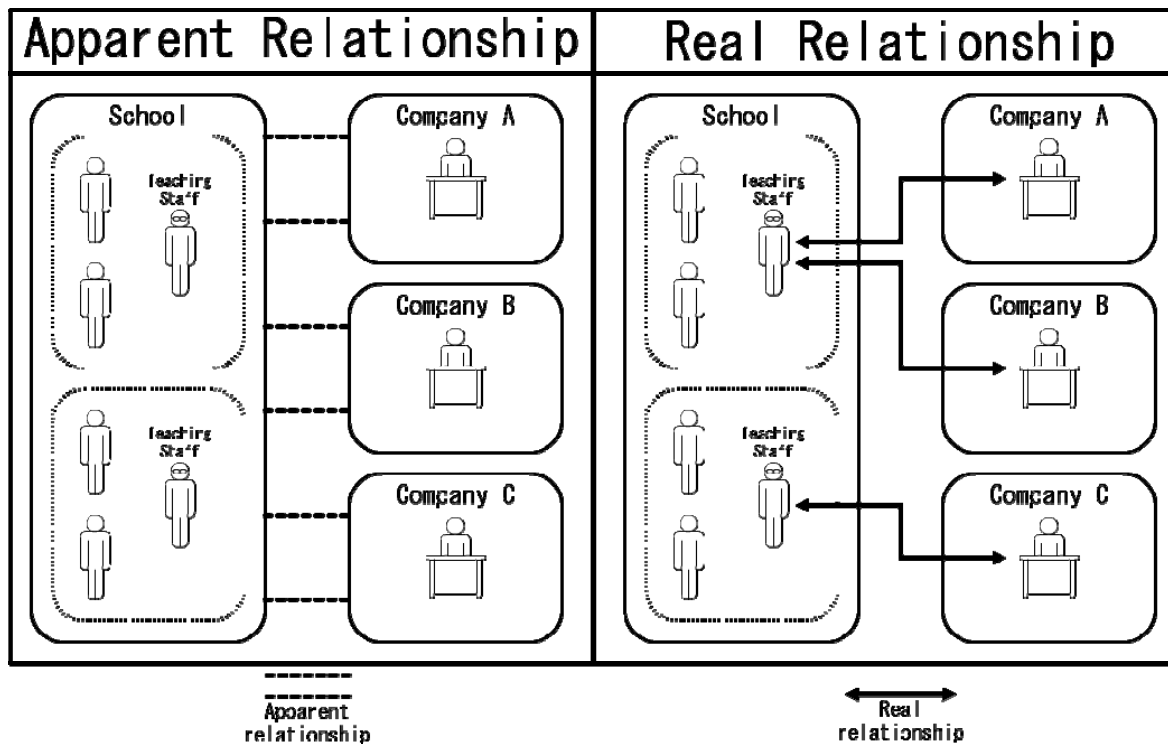


Figure 1 Apparent relationship and real relationship

3.1.2 Quantity factor as educational institution's size

Teaching staff members interact with each other and with students every day. This relationship can be further divided into horizontal and vertical relationships. The horizontal relationship denotes being able to build a new relationship as a mediator with other members of the teaching staff. The vertical relationship denotes being able to build a new hierarchical relationship, for example, the relationship between seniors and juniors. Horizontal and vertical relationships are analyzed by investigating the number of teaching staff members and students. The author refers to the number of teaching staff members and students as "quantity factors."

3.2 Research methods

A questionnaire was used to collect data in this study. There were two reasons for doing so. First, a consistent quality of survey responses was needed. Second, survey targets were available in several different countries. The questionnaire was composed of 41 questions concerning the aforementioned quantity and quality factors. It was administered to 224 teaching staff members at random via e-mail in maritime educational institutions in 31 countries and regions.

3.3 Results

The author was able to obtain data over a two-month period. Data were obtained from 39 people out of 19 countries. The response rate was 17%. The following is a list of regional groups that submitted responses to the questionnaire (the regions were grouped using the informal setting of the United Nations). "Western

European and Others" accounted for about 54% of the responses.

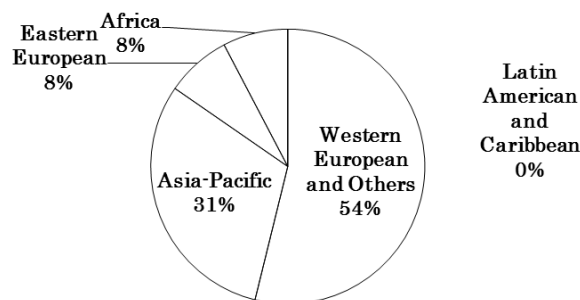


Figure 3. Proportion of respondents by area

The Asia-Pacific group comprised about 31%. The Eastern European group comprised about 8%. The Africa group comprised about 8%. The author could not obtain responses from the Latin American and Caribbean groups. Figure 3 indicates the area ratio of respondents.

4 ANALYSIS OF SOCIAL NETWORKS

4.1 Data analysis

The data acquired during this research were analyzed using statistical analysis methods, namely the STATA for Windows program, 12th version. The following data methods for analyzing quantitative descriptive statistics were used: cross tabulation and correlation analysis using the linear regression method. The significance level was set at 5% in this analysis. All

missing values in the data were excluded before analysis.

4.2 Situation of social networks

In order to determine the status of social networking among teaching staff, 41 questions were asked. Number of companies as personal relationship asked from between 0 and 50 by 5 steps. The results showed that personal social networks connected an average of 20.8 companies. The median value was 16 companies. In the data, social networks tended towards smaller networks.

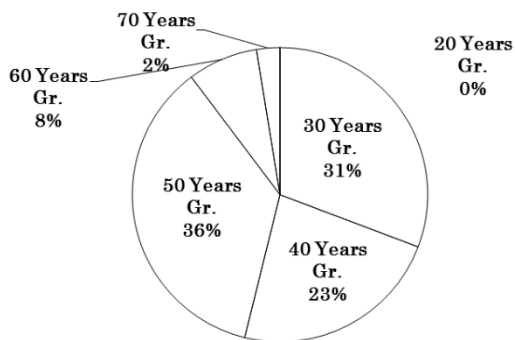


Figure 4. Age distribution of the respondents

4.3 Personality as quality factor

4.3.1 Age as quality factor

Time gives one the opportunity to do many things. To put it plainly, a person gains experience with age. This time element is able to replace to the age of the teaching staff. The size of the social network by age was analyzing. The age value had an average value of 47.8 years, and the median value was 45 years. There was no group of respondents in their 20's. Figure 4 indicates the age structure of the respondents.

Table 1 shows the result of the relationship between age and social networks. The p-value was 6.7%, which is greater than the significance level at 5%. According to these findings, age is therefore not significant with regard to social networks.

Table 1. Relationship between age and social networks

Social net's	
Age	0.317 (1.00)
_cons	-3.074 (-0.20)
R	
.26	

t statistics in parentheses
* p<0.05, ** p<0.01, *** p<0.001

4.3.2 Educational career as quality factor

The survey results were plotted in Figure 5 using diamonds in order to analyze the relationship between social networks and the educational careers of the respondents.

The educational careers of respondents averaged 15.7 years, with a median 14 of years. Table 2 shows the results of a detailed analysis of educational careers. The p-value was 26%, and the adjusted R-square was 0.068. The p-value was greater than the significance level at 5%. The significance was therefore not confirmed from an educational career standpoint.

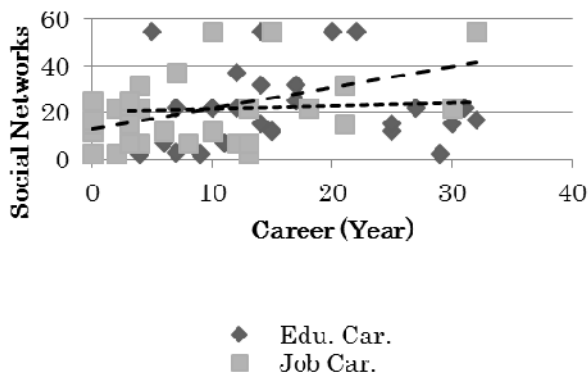


Figure 5. Results of survey of educational career and professional career

Table 2. Relationship between educational career and social networks

Social net's	
Edu_car	0.115 (0.30)
_cons	20.51** (3.17)
R	
.21	

t statistics in parentheses
* p<0.05, ** p<0.01, *** p<0.001

4.3.3 Professional career as quality factor

Survey results were plotted in Figure 5 using squares. The professional careers of the respondents averaged 8.4 years with a median of 4 years. Table 3 illustrates the detailed results of professional careers and social networks. The p-value for professional career was 0.0%. The adjusted R-squared of the coefficient was determined to be 0.23. Significance was confirmed from the standpoint of professional career. The p-value was lower than the significance level at 5%. Significance was confirmed for professional career.

Table 3. Relationship between professional career and social networks

Social_net's	
Job_career	0.0000** (3.30)
_years	12.7200** (3.70)
N	26

t statistics in parentheses
* p<0.05, ** p<0.01, *** p<0.001

The survey results for total career were plotted in Figure 6. Table 4 provides detailed results. The p-value was 0.2%. Adjusted R-squared of the coefficient of determination was 0.261. The significance was also confirmed from the total career.

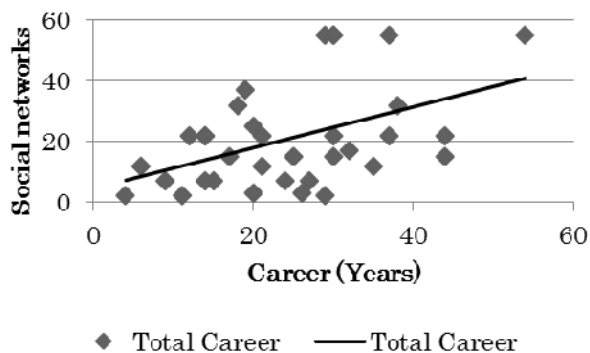


Figure 6. Relationship of total career and personal social network

4.4 Size of educational institution as quantity factor

4.4.1 Number of teaching staff members as quantity factor

The survey results were plotted in Figure 7 using diamonds in order to analyze the number of teaching staff members. The number of teaching staff members averaged 54.7, with a median of 49. Table 5 shows the results of detailed analysis of the number of teaching staff. The adjusted R-squared was -0.043. Significance was therefore not confirmed for number of teaching staff members.

Table 5. Relationship between number of teaching staff members and social networks

Social_net's	
No_of_teachers	0.00001 (0.05)
_years	24.0900** (3.51)
N	25

t statistics in parentheses
* p<0.05, ** p<0.01, *** p<0.001

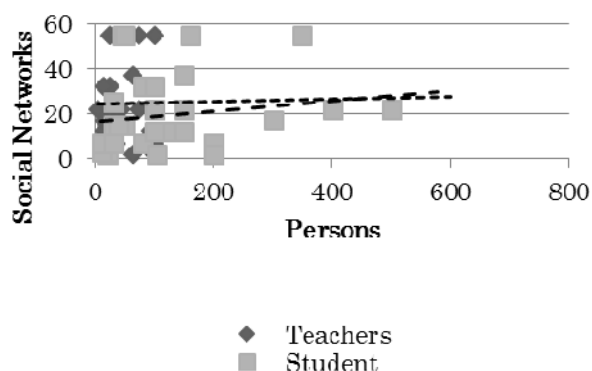


Figure 7. Relationship between number of teaching staffs and students

4.4.2 Number of students as quantity factor

Survey results were plotted in Figure 7 using squares in order to analyze the number of students. The number of students averaged 196 persons, with a median of 100. Table 6 shows the results of a detailed analysis of the number of students. The adjusted R-squared of the coefficient of determination was 0.125. The p-value was lower than the significance level at 5%. Thus, significance was confirmed for the number of students.

Table 6. Results of the relationship between number of students and social network

Social_net's	
No_of_students	0.00001 (0.05)
_years	24.0900** (3.51)
N	25

t statistics in parentheses
* p<0.05, ** p<0.01, *** p<0.001

4.5 Discussion

At present, it may be useful to look more closely at some of the more important features of the critical factors that affect social networks. In order to calculate the Pearson's product-moment correlation coefficient analyzing these factors.

Table 7 shows the results of the correlation coefficients for professional career, number of students, and social network (professional career group). Table 8 shows the results of correlation coefficients for total career, number of students, and social network (total career group).

It was found that professional career had a correlation coefficient at 0.5011, and number of students had a correlation coefficient of 0.3896. Total career had a correlation coefficient of 0.5347, and number of students had a correlation coefficient of 0.3896. Finally, the professional career group and the total career group had a significance level of 5%.

These results clarified the role played by social networks in the relationship between teaching staffs and companies. The factors of the professional career of teaching staffs and the number of students were also confirmed. The professional career builds the social network. It is a strong effect by the career in the company. It seems reasonable to suppose that the company expand the personal networks by the job and the role with the external. The number of students also builds the social network. This effect is weaker than professional career. The teaching staff can cultivate relationships with students, recruiting companies and the graduates of different generations, if there are many students in the school. However, this is a debatable point. These details are required the panel survey to wide and long-term.

Table 7. Result of correlation coefficient of Professional career, number of student and Social networks

	Social_net's	Job_car	No_of_students
Social_net's	1.0000		
Job_car	0.5011*	1.0000	
No_of_students	0.3896*	0.3896*	1.0000

* p<0.05

Table 8. Result of correlation coefficient of Total career, number of student and Social networks

	Social_net's	Total_Career	No_of_students
Social_net's	1.0000		
Total_Career	0.5347*	1.0000	
No_of_students	0.3896*	0.3896*	1.0000

*p<0.05

5 CONCLUSION

This study examined the role of social networks in maritime educational institutions.

It was found that the personal social networks of the teaching staff in maritime educational institutions are affected by their professional career and by the number of students. Granovetter (1973) and Burt (1992) discussed the issue of the relationship between social networks and employment. However, changing the number of students is difficult. It is important the social performance of the teaching staff for that keep or increase the social networks under the condition.

In maritime educational institutions, it is increasingly the case that students do not want to become seafaring officers. The results of surveys by BIMCO have confirmed this. The supply human resources need the new social network which was connect to the various quarters that is not only to the seafarer. These connections will provide the infrastructure of generate a new identity for maritime educational institutions.

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