

# HOW TO PROVIDE MASTERS WITH REQUIRED ATTITUDES

Mustafa KALKAN<sup>1</sup> and Hakkı KIŞI<sup>2</sup>

**Abstract** - *The most internationalized and the multi-disciplinary feature of ocean going shipping enlarges the scope of the liabilities of masters. This makes it a must for them to be well- equipped with certain sets of professional knowledge, skills, and attitudes.*

*This study focuses on the attitudes required as they play a critical role in triggering and directing the effective management of the knowledge and the skills gained. Within this focus, the alleged effects of the “Problem- Based Learning Method” on forming and/ or developing attitudes are analyzed.*

*The study consists of two parts. The first part aims to determine the basic sets of attitudes to be internalized by ocean going masters, as well as the officers on board a ship (the initial steps to the master’s position). In preparing this part, some interviews with the leading shipping companies in Turkey, in addition to a thorough literature review, are made use of. The second part focuses on the effects of the problem- based learning method on developing certain desirable attitudes. This focus is based on the concrete evaluation of the results of a questionnaire administered consecutively at the end of the last two academic years through two groups of higher education students, those exposed to the traditional teaching methods and those exposed to the problem- based learning method. The questionnaire aims to determine the attitudes of the students as well as the effects of the method(s) employed. The demographic audience targeted includes, in addition to the maritime higher education institutions, such disciplines as law, medicine, nursery, and dentistry, which are similar to the ocean going shipping, in terms of the attitudes required.*

*The study includes, as a conclusion and based on the concrete results of the questionnaire, certain proposals with the hope to contribute to the promotion of the attitudes required, which is an indispensable must on the way to sustain efficient and effective navigations.*

**Key Words** - *Oceangoing officers/ masters, Effective Navigation, Required Attitudes, Problem Based Learning (PBL), Maritime Education and Training (MET)*

## INTRODUCTION

Although at the top of the organization-hierarchical order-designed onboard merchant vessels to carry out the navigational activities including loading/discharging cargoes stands the Master, deck officers and engineers are also allocated crucial roles. That’s why particularly deck officers are implicitly included in the term “masters” used in this study. In fact, if safe, efficient, and effective voyages are to be reached, certain favorable attitudes are to be acquired and internalized by masters, officers and engineers.

As for the question of how to provide the attitudes required, problem-based learning method (PBL) is believed to be a proper means to be employed at MET. With a student-centered medium of instruction, PBL is said to inspire in students certain favorable attitudes specifically with regards to achievement goal, cooperation, intrinsic motivation, self-confidence, empathy, responsibility, critical thinking, questioning-changing-adopting-integrating and proaction. Based on the basic principles of cognitive psychology, this method focuses on providing intrinsic motivation, active involvement of students in learning activities, information processing skills and learning to learn, through the faculties improved and favorable attitudes enhanced, PBL is also claimed to advance skills on such activities of high value as efficient and effective decision making, problem-solving and communicating. When the alleged advantages are considered, the gainings to be achieved through PBL seem to be extremely

---

<sup>1</sup> Dokuz Eylül University, School of Maritime Business and Management, Kaynaklar Campus, 35160 Izmir, Turkey

<sup>2</sup> Dokuz Eylül University, School of Maritime Business and Management, Kaynaklar Campus, 35160 Izmir, Turkey  
e-mail: hakki.kisi@deu.edu.tr

impressive, most likely to meet the requirements in MET particularly in terms of the inevitable sets of attitudes.

The aim is primarily focused on to what extent PBL affects the attitudes that are of vital importance in reaching efficient and effective voyages in oceangoing shipping. And the results gained through the two-year questionnaire administration stage are hoped to give some preliminary idea about reforming and bettering the approaches and/or methods in MET.

## **ATTITUDES REQUIRED AT ACCOMPLISHING EFFECTIVE OCEANGOING VOYAGES**

The parties for whom masters have liabilities are numerous. Owners/agents, shippers, cargo and/or passengers, ships, crew onboard ships, marine environment are just some of them. All the liabilities along with the authorities of masters are designed and enforced through certain national as well as international regulations. Although such regulations determine the overall frame of the liabilities, there are still certain acts to be displayed, lying behind the frame drawn by such regulations. They are the attitudes to be acquired and internalized. While some of these attitudes could be shaped by and gained from traditions, some of them should still be formed and enhanced by certain professional training and education.

Life on board a ship is greatly different from that on land in that the former is restricted to a limited space with relatively limited facilities. In such terms, those on board a ship have got to depend on one another and act as a team to solve the problems encountered. Any individual failure could mean a break in the whole which might result in a deadly collapse in the task shouldered. The unique feature of life on board makes it inevitable to establish a decent cooperation, team work, mutual understanding including empathy, sympathy, as well as self-evaluation.

Unlike life on land, compensation for any negligence on board a ship might be impossible or at least overcostly. This diverse nature underlines the importance of sense of responsibility. Besides, as any unexpected happenings need to be handled with urgent care, problem-solving skills are to be underlined along with proper and prompt decision-making abilities. Such abilities naturally call for such attitudes as self-confidence, eliminating overconfidence, self-efficacy and self-schemata. Furthermore, considering the huge costs of correction and indemnity issues, proactive approach seems to be primarily focused on.

The great importance of the above briefed attitudes to be acquired by the authorities involved in ocean going voyages has been proved by the feedback received from the representatives of the Turkish shipping companies. On Feb.19, 2004 a forum was arranged in Istanbul with the leading Turkish shipowners and/or their representatives. The aim of the forum was to specify the expectations of the shipping industry from the maritime related teaching and training institutions particularly with respect to the qualifications sought with ocean going officers. At the forum, all the participants put forward their expectations individually. The notes taken reveal that the most desired attitudes are “tendency towards taking part in team work”, “strengthening leadership qualifications”, “enhancing the sense of responsibility”, “improving self-confidence, self-efficacy, and self-schemas”, “ability to get used to the new environments”, “establishing willingness and intrinsic motivation favoring loyalty to the task given and courage to fight with challenges”, “cooperation”, “sharing knowledge and experience”, and “improved communication skills”.

## **THE EFFECTS OF PROBLEM-BASED LEARNING METHOD ON ATTITUDES**

Problem-based learning is a student centered and modular approach based on a scenario to be discussed at problem-based learning (PBL) sessions, where learning objectives are determined and self-direction is encouraged. The scenario is used to trigger motivation for learning which is structured and directed through the learning objectives. It is then supported by certain other activities related with the integrated body of the module. Some of such activities could be lectures, professional skills, field work, communication skills, and ethics.

Literature review (Brown and Atkins,1994; Davies,1998; Garcia and Pintrich,1994; Laurillard,1993; Pressley, and McCormick,1995; Ventimiglia,1995; Wigfield,1994) clearly reveals that PBL contributes a lot to establishing and/or changing learner attitudes. Considering the wealth of contributions and many other invaluable benefits of this method, DEU School of Maritime Business and Management has adopted PBL for the last three years, following six other faculties at the university.

### The Aim and Scope of the Research

The basic aim of the research is to find out whether adoption of PBL has actually helped to form certain attitudes; and if it has, to what extent. The aim also covers determining the measures to be taken, remedies to be practiced and corrections to be made.

The research has been carried out at such higher education institutions as: DEU School of Maritime Business and Management (DEU-SMBM), ITU Maritime Faculty (ITU-MF), KTU Faculty of Marine Science (KTU-FMS), Hogeschool Zeeland (HZ), DEU Faculty of Medicine (DEU-FM), DEU Faculty of Nursery (DEU-FN), DEU Faculty of Law (DEU-FL), EU Faculty of Dentistry (EU-FD). Of these institutions, DEU-SMBM, DEU-FM, DEU-FN and DEU-FL have adopted PBL, and the others still pursue the traditional methods of teaching.

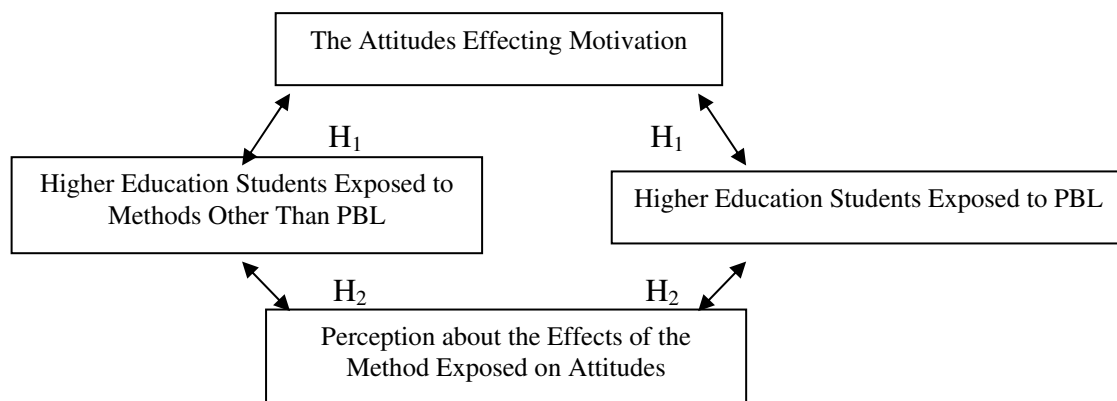
### Research Model and Hypotheses

The research aims at determining the effects of the two different approaches (PBL and traditional ones) on forming attitudes. To do this, two basic hypotheses have been formed and as a support to them, two groups of subhypotheses have been included.

H<sub>1</sub>: The attitudes, effective in motivation, of the higher education students exposed to PBL differ from those of the higher education students exposed to the traditional methods.

H<sub>2</sub>: The higher education students exposed to PBL perceive the effects of the method on their attitudes differently from how the higher education students exposed to the traditional methods perceive.

#### THE RESEARCH MODEL



### Methodology

The hypotheses were tested through a questionnaire consisting of three sections: Participant Profile, Attitudes, and Perceptions. The first section comprised four questions about the participant’s personal identity. The second covered totally 33 concepts/items detailing such sets of attitudes likely to effect motivation as “achievement goals”, “cooperation”, “self-confidence”, “empathy”, “responsibility”, “independent thinking”, “critical approach”, “proaction” and “changing”. The participants were asked to answer the question “To what extent does this item agree with my own

attitudes?” considering the scale given (Likert’s 5 scales). The third section comprised the nine basic sets of attitudes and the participants were asked to complete the statement “I have felt myself changed with respect to the attitudes regarding...” using the scale given.

While forming the contents of the questionnaire, the relevant literature review, unstructured interviews with the employers in Turkish shipping industry and the “minutes of meeting” of the brainstorming sessions held by the DEU SMBM academicians were made best use of.

### **Data Collecting and Sampling**

The questionnaire, issued both in English and Turkish, were administered through the first and second term students studying at the higher education institutions included in the scope. It was conducted twice, towards the end of 2002-2003 and 2003-2004 academic years. The questionnaire was delivered to the head of each department in envelopes to be administered at the most proper time. It was then collected either directly in hand or through cargo mail, employing the former to those located in Izmir and the latter to those out of Izmir.

### **Research Results**

The results comprised the profile table and the evaluation of the hypotheses.

### **Participant Profile**

Gender and ages were not included in the table as they have been found “not effective” in the results. The overall age average was found to lie between 20.38 and 21.14.

TABLE 1  
Participant Profile

	<b>2003 n</b>	<b>2004 n</b>
Nautical Science, Term 1 (PBL)	35	36
Maritime Bus. Adm., Term 1 (PBL)	45	75
Law, Term 1 (PBL)	61	
Law, Term 2 (PBL)		65
Medicine, Term 1 (PBL)		112
Medicine, Term 2 (PBL)		101
Dentistry, Term 1 (Traditional)	72	
Dentistry, Term 2 (Traditional)		58
Marine Science, Term 2 (Traditional)		24
Hogeschool, Term 1 (Traditional)	33	
Hogeschool Term 2 (Traditional)	40	
Nautical Science Term 2 (Traditional)		96
<b>TOTAL</b>	<b>286</b>	<b>567</b>

### **Test Results**

To get the results, t-test was used; and to reach the most possible accurate evaluation, the results were considered/processed in groups.

Due to the limited space in this paper, only two of the tables revealing the results are presented here, including the subsequent evaluations.

## Test Results Concerning Nautical Science Departments Offering MET in Oceangoing Officers Training

The results gained from the Nautical Science Department Term 2 students studying at Dokuz Eylul University School of Maritime Business and Management (DEU-SMBM) were compared with the results gained from the similar department students studying at three other universities, namely Karadeniz Technical University Marine Science Department (KTU-MSD), Istanbul Technical University Maritime Faculty (ITU-MF) and Hogeschool Zeeland. Of these departments, DEU-SMBM has adopted Problem-based Learning while the other three still adhere to the traditional teaching methods. The hypothesis tested and compared related with the nautical science students was formed as follows:

H<sub>1</sub>: The attitudes, effective in motivation, internalized by the students studying at DEU-SMBM where PBL has been adopted differ from those internalized by the students studying at the other higher maritime education institutions where traditional teaching methods are in use.

TABLE 2

t-test Results Comparing and Contrasting the Attitudes of DEU-SMBM Nautical Science Department Term 2 Students Exposed to PBL with Those of KTU-MS, ITU-MF, and Hogeschool Term 2 Students Exposed to Traditional Methods:

STATEMENTS	KTU-MS			ITU-MF			Hogeschool Zeeland		
	Ave	Sd	Support	Ave	Sd	Support	Ave	Sd	Support
1 Studying exam topics	3,4857	0,8531		3,4857	0,8531		3,4857	0,8531	Supported
	3,4348	1,0369	Not Supported	3,3226	1,1993	Not Supported	3,2821	0,887	t:6,1293
2 Studying profession-related topics	4,4571	0,6572	Supported	4,4571	0,6572	Supported	4,4571	0,6572	
	4	0,7385	t:2,4075	3,8105	1,0748	t:3,3323	3,375	0,8679	Not Supported
3 Studying easy-to-understand topics	3,1429	1,0612		3,1429	1,0612		3,1429	1,0612	
	3,6818	1,3588	Not Supported	3,3191	1,1284	Not Supported	3,175	0,7808	Not Supported
4 Studying self-interested topics	4,0286	0,8907		4,0286	0,8907		4,0286	0,8907	Supported
	3,625	0,9237	Not Supported	3,5053	1,1749	t:2,3918	3,425	0,7808	t:3,1001
5 Sharing materials	4,3429	0,7648	Supported	4,3429	0,7648	Supported	4,3429	0,7648	Supported
	3,375	1,0555	t:4,087	3,8	1,1724	t:2,5439	3,85	0,6622	t:2,9628
6 Sharing aims	4,3143	0,9322	Supported	4,3143	0,9322	Supported	4,3143	0,9322	
	3,3333	1,2394	t:3,4694	3,6632	1,2684	t:2,771	3,975	0,6975	Not Supported
7 Prioritizing individual achievement	3,3429	1,3708		3,3429	1,3708	Supported	3,3429	1,3708	
	3,9167	1,1765	Not Supported	3,8105	1,1137	t:-1,8103	3,375	0,9789	Not Supported
8 Determining own limits	3,8571	1,2401		3,8571	1,2401		3,8571	1,2401	Supported
	4,375	0,9237	Not Supported	3,8191	1,097	Not Supported	3,25	0,8697	t:2,4783
9 I want I can	4	1,0572		4	1,0572		4	1,0572	
	4	0,7802	Not Supported	3,8105	1,1605	Not Supported	3,725	1,0619	Not Supported
10 Not "what can't I do?" but "what can I do?"	3,8	1,1581		3,8	1,1581		3,8	1,1581	
	3,9583	0,7506	Not Supported	3,6316	1,1583	Not Supported	3,55	0,9594	Not Supported
11 Limiting outsider effects	3,2	1,3677		3,2	1,3677		3,2	1,3677	
	3,1304	0,9679	Not Supported	2,7579	1,2353	Not Supported	3,225	0,5305	Not Supported
12 Challenges bear despair	3,1714	0,9231		3,1714	0,9231	Supported	3,1714	0,9231	
	2,9091	1,065	Not Supported	2,6632	1,0479	t:2,6824	3,2564	0,7853	Not Supported
13 Failure diminishes enthusiasm	3,6571	1,2821		3,6571	1,2821		3,6571	1,2821	
	3,2083	1,2504	Not Supported	3,1828	1,3017	Not Supported	3,125	0,8825	Not Supported
14 Avoiding eye contacts	3,0286	1,1501		3,0286	1,1501		3,0286	1,1501	
	3,0833	0,9286	Not Supported	2,5978	1,1489	Not Supported	2,625	1,0786	Not Supported
15 Incentives prerequisite for success	3,9714	0,822		3,9714	0,822	Supported	3,9714	0,822	Supported
	3,5	1,2511	Not Supported	3,2151	1,2498	t:3,3164	3,0789	0,8505	t:4,5581
16 If I were him/her, how would I act?	3,7714	1,1903		3,7714	1,1903		3,7714	1,1903	Supported
	3,75	0,8969	Not Supported	3,3579	1,1752	Not Supported	3,025	0,8912	t:3,0972
17 Considering others interest	3,7143	1,1		3,7143	1,1		3,7143	1,1	
	3,4583	0,8836	Not Supported	3,5158	1,0804	Not Supported	3,425	0,7472	Not Supported
18 Listening patiently	4,1429	0,7724		4,1429	0,7724		4,1429	0,7724	Supported
	3,9583	0,7506	Not Supported	3,7684	1,0361	Not Supported	3,575	0,7808	t:3,1603
19 Questioning events around	3,6571	0,9684		3,6571	0,9684		3,6571	0,9684	Supported
	3,75	0,7372	Not Supported	3,5684	1,0278	Not Supported	3,15	0,893	t:2,346
20 Self-determining "what?" and "what extent?"	3,6857	0,9		3,6857	0,9		3,6857	0,9	
	3,7083	1,0417	Not Supported	3,3789	1,0125	Not Supported	3,55	0,8458	Not Supported

21	Self-decision in material choice	3,6765	0,9761	Not Supported	3,6765	0,9761	Not Supported	3,6765	0,9761	Not Supported
		3,5652	1,0798		3,4457	1,083		3,325	0,859	
22	Ordering priorities secondaries	3,8857	0,9	Not Supported	3,8857	0,9	Not Supported	3,8857	0,9	Supported t:2,8367
		3,8333	0,8681		3,7234	1,1207		3,3	0,8829	
23	Interest in getting assigned at group work	3,5143	0,9813	Not Supported	3,5143	0,9813	Not Supported	3,5143	0,9813	Not Supported
		3,1667	0,9168		3,5474	1,1182		3,625	0,7403	
24	Regret for others sorrow	3,4571	1,0939	Not Supported	3,4571	1,0939	Not Supported	3,4571	1,0939	Not Supported
		3,6667	1,1106		3,4468	1,2836		3,125	0,7906	
25	Contributing group work with proposals	3,8857	1,0784	Not Supported	3,8857	1,0784	Not Supported	3,8857	1,0784	Supported t:3,0582
		3,5217	0,898		3,7634	1,0673		3,225	0,7334	
26	Practising proaction	3,7714	1,0596	Not Supported	3,7714	1,0596	Not Supported	3,7714	1,0596	Not Supported
		3,6522	0,9821		3,3441	1,3063		3,375	0,6675	
27	Benefiting from similar problems	3,9429	0,9375	Supported t:2,2058	3,9429	0,9375	Supported t:2,373	3,9429	0,9375	Supported t:3,883
		3,4783	0,6653		3,4839	1,0695		3,25	0,5883	
28	Action before due time	2,5882	1,209	Not Supported	2,5882	1,209	Not Supported	2,5882	1,209	Supported t:-3,2487
		3,0833	0,9286		2,7742	1,1622		3,375	0,8679	
29	Practising cause-effect relations	3,8824	0,8796	Not Supported	3,8824	0,8796	Not Supported	3,8824	0,8796	Supported t:3,0229
		3,5652	0,8435		3,7128	1,0739		3,3	0,7579	
30	Criticism may source for solutions	3,8529	0,8214	Not Supported	3,8529	0,8214	Not Supported	3,8529	0,8214	Supported t:2,4213
		3,9167	0,7755		3,4624	1,1186		3,425	0,6751	
31	Practising knowledge classification	3,9118	0,7121	Not Supported	3,9118	0,7121	Not Supported	3,9118	0,7121	Supported t:4,6571
		3,625	0,9237		3,6489	1,0022		3,175	0,636	
32	Sellers never criticise own products	2,8857	1,0784	Not Supported	2,8857	1,0784	Not Supported	2,8857	1,0784	Not Supported
		3,2083	0,9315		2,9043	1,192		2,9	1,0328	
33	Education limited in schools	2,8286	1,3609	Not Supported	2,8286	1,3609	Not Supported	2,8286	1,3609	Not Supported
		2,9583	1,3345		2,5806	1,409		3,075	0,9711	

The first four items ( $H_{11}$ ,  $H_{12}$ ,  $H_{13}$  and  $H_{14}$ ) are used to test the achievement type internalized.

$H_{11}$  is not supported with KTU-MS and ITU-MF students, i.e., no significant difference appears in the achievement type internalized by DEU-SMBM students and KTU-MS and ITU-MF students. The hypothesis ( $H_{11}$ ); however, is supported with Hogeschool students. This result might imply that the approach of the Turkish students, no matter what teaching method is adopted by their department, is similar towards exams, which is different from the approach of the Dutch students. The difference might be inferred as certain other factors, depending upon certain national criteria, play more important roles in forming the achievement type.

The test for  $H_{12}$  reveals interesting results. The approaches towards “tendency to study profession-related subjects” appear to differ depending upon the teaching method exposed. However, the difference seen between DEU-SMBM students and the other two Turkish university students (KTU-MS and ITU-MF) is not supported with the Hogeschool students. This picture again reminds the more powerful effects sourced from certain national features/conditions.

$H_{13}$  seems not to be supported with any of three institutions. This might imply that no matter what teaching method is adopted by the institution, all nautical science students are well aware of the fact that their job is full of challenges.

The results concerning  $H_{14}$  seems to emphasize the importance of the teaching method employed. The great difference between the attitudes of DEU-SMBM students and ITU-MF and Hogeschool students imply the effect of the method on forming certain intrinsic motivation.

$H_{15}$ ,  $H_{16}$ ,  $H_{17}$  and  $H_{18}$  aim to test the inclination towards cooperation.

$H_{15}$ , well supported, clearly emphasizes the important effects of the teaching method employed in forming “willingness to share materials”.

The results of  $H_{16}$  seems to underline the importance of the teaching method employed in enhancing the favorable mood in cooperation and team work, reminding the basic principle on board a ship: “Sink together or float together”. That the results with Hogeschool students do not support the hypothesis might be the implication of certain national effects.

The results concerning  $H_{17}$  (inclination to prioritize individual achievement) reveal two important points: the difference between the attitudes of DEU-SMBM students and those of ITU-MF students underlines the importance of the teaching method employed. On the other hand, however, the hypothesis is not supported with KTU-MS and Hogeschool students, which might point to certain regional and national factors being more effective than the method of teaching employed.

H<sub>18</sub> and H<sub>19</sub> along with H<sub>11</sub>, H<sub>12</sub>, H<sub>13</sub> and H<sub>14</sub> serve to test the attitude concerning “self-confidence and self-efficacy.” The results reveal that the most distinctive outlook is reflected in H<sub>18</sub> “determining one’s own limits” between the attitudes of DEU-SMBM and those of Hogeschool. No significant difference, however, appears in the attitudes of the Turkish students, which again reminds the effects of certain national aspects. The only item in this group revealing the importance of the teaching method on attitudes appears in the result in H<sub>12</sub> “difficulties bear despair”, between DEU-SMBM and ITU-MF.

Concerning the attitudes related with “listening” and “communication; (H<sub>118</sub>) the results reveal that the teaching method employed is effective to a certain extent, but national aspects are more likely to form this attitude.

H<sub>120</sub>, H<sub>121</sub> and H<sub>122</sub> aim to test the attitudes towards self-direction and self-regulation. The difference in approaches is seen only with H<sub>122</sub> (listing the items to be studied according to importance). Neither of the other hypotheses are supported, which should be questioned as one of the most important gainings from PBL is claimed to be improving self-regulation.

“Tendency towards willingness to contribute to team work” is tested through H<sub>123</sub>, H<sub>124</sub> and H<sub>125</sub>. The results reveal that the only difference is observed in H<sub>125</sub> between DEU-SMBM and Hogeschool students. When the meaningful difference gained about “tendency towards cooperation” through H<sub>15</sub> and H<sub>16</sub> is considered, it could be inferred that the outlook of the groups about cooperation is different from their approach to the “active involvement” in team work.

The attitude about “Proaction” is tested through H<sub>126</sub> which is not supported. This might imply that no matter what the teaching method is, this attitude is regarded of primary importance or that applying PBL should be questioned in terms of effectiveness.

“Improving problem-solving skills”, which is claimed to be one of the gainings from PBL, is tested through H<sub>127</sub> and the results reveal that this method looks quite promising in enhancing this attitude.

Through H<sub>129</sub> and H<sub>130</sub> the attitudes towards “cause-effect relations” and “classifying knowledge” are tested. Both attitudes are related with self-direction and self-regulation. The similarity between the results gained about these two items and those about H<sub>120</sub>, H<sub>121</sub> and H<sub>122</sub> looks reasonable.

H<sub>132</sub> and H<sub>133</sub> are used to test the attitudes towards “self-evaluation” and “life-long learning” respectively. The results, however, reveal that there are no significant differences in the attitudes of the group. Since these two attitudes are claimed to be strengthened by PBL, either this claim or the effectiveness of PBL application (or both) is to be questioned.

As an overall evaluation of the results, the teaching method is likely to play an important role in establishing certain attitudes mainly about “interest in professional issues”, “sharing materials”, “sharing aims”, “fighting against challenges”, “regarding incentives important” and “problem-solving skills”. On the other had, the results concerning “self-evaluation”, “self-regulation” and “constructive approach to criticisms” are to be questioned, for these attitudes are claimed to be some of the primary gaining from PBL.

### **Test Results of the Hypotheses Concerning the Attitudes of the Students Studying Nautical Science and of Those Studying Other Disciplines**

The results gained from the Nautical Science Department Term 2 students studying at Dokuz Eylul University School of Maritime Business and Management (DEU-SMBM) were compared with the results gained from the term 2 students at some other disciplines, all the participants having been exposed to PBL.

The hypothesis tested and compared was formed as follows:

H<sub>1</sub>: The attitudes, effective in motivation, internalized by the term 2 Nautical Science Students Studying at DEU-SMBM do not differ from those internalized by the term 2 students studying other disciplines as “maritime business administration”, “medicine”, “law” and “nursery”, all the participants having been exposed to PBL.

TABLE 3

t-test Results Comparing and Contrasting the Attitudes of DEU-SMBM Nautical Science Department Term 2 Students Exposed to PBL with those of Term 2 Students Also Exposed to PBL but Studying Other Disciplines (Maritime Business Administration, Medicine, Law and Nursery).

STATEMENTS		DEU Faculty of Medicine			DEU Maritime Business Administration			DEU Faculty of Law			DEU School of Nursery		
		Ave	Sd	Support	Ave	Sd	Support	Ave	Sd	Support	Ave	Sd	Support
1	Studying exam topics	3,4857	0,8531	Not Supported	3,4857	0,8531	Supported t:-3,0313	3,4857	0,8531	Supported t:-2,1517	3,4857	0,8531	Not Supported
		3,7921	0,8163		4,1389	0,9607		3,8769	0,8928		3,4902	1,1379	
2	Studying profession-related topics	4,4571	0,6572	Supported t:4,9504	4,4571	0,6572	Not Supported	4,4571	0,6572	Supported t:5,3414	4,4571	0,6572	Not Supported
		3,7624	0,862		4,0556	1,0676		3,3175	1,1616		4,2308	0,7825	
3	Studying easy-to-understand topics	3,1429	1,0612	Supported t:-2,2281	3,1429	1,0612	Not Supported	3,1429	1,0612	Not Supported	3,1429	1,0612	Not Supported
		3,59	0,9		3,4167	1,0247		3,2188	1,2783		3,0385	1,3857	
4	Studying self-interested topics	4,0286	0,8907	Not Supported	4,0286	0,8907	Not Supported	4,0286	0,8907	Not Supported	4,0286	0,8907	Supported t:-3,5031
		3,901	0,8776		3,8611	0,8669		3,6719	1,2606		4,6154	0,5297	
5	Sharing materials	4,3429	0,7648	Supported t:4,1717	4,3429	0,7648	Supported t:3,925	4,3429	0,7648	Supported t:2,6584	4,3429	0,7648	Not Supported
		3,4356	1,2035		3,3056	1,3695		3,6615	1,4062		4,6226	0,6272	
6	Sharing aims	4,3143	0,9322	Supported t:5,5918	4,3143	0,9322	Supported t:2,831	4,3143	0,9322	Supported t:3,8546	4,3143	0,9322	Not Supported
		3,2079	1,2026		3,5278	1,3625		3,3281	1,3458		4,3077	0,7551	
7	Prioritizing individual achievement	3,3429	1,3708	Supported t:-2,0429	3,3429	1,3708	Not Supported	3,3429	1,3708	Supported t:0,0158	3,3429	1,3708	Supported t:-2,6807
		3,802	1,0585		3,9167	1,079		4,0308	1,0303		4,0377	1,0554	
8	Determining own limits	3,8571	1,2401	Not Supported	3,8571	1,2401	Not Supported	3,8571	1,2401	Not Supported	3,8571	1,2401	Not Supported
		3,8911	1,0574		3,6111	1,1533		3,9688	1,023		4,283	0,9068	
9	I want I can	4	1,0572	Not Supported	4	1,0572	Not Supported	4	1,0572	Not Supported	4	1,0572	Supported t:-3,2314
		4,08	1,0414		4	1,069		4,0923	0,9138		4,5962	0,6645	
10	Not "what can't I do?" but "what can I do?"	3,8	1,1581	Not Supported	3,8	1,1581	Not Supported	3,8	1,1581	Not Supported	3,8	1,1581	Supported t:-2,5998
		3,802	0,9276		3,5556	1,1574		3,6923	1,1029		4,3269	0,7335	
11	Limiting outsider effects	3,2	1,3677	Not Supported	3,2	1,3677	Not Supported	3,2	1,3677	Not Supported	3,2	1,3677	Not Supported
		3,05	1,0766		2,6389	1,1502		3,1692	1,0543		2,9434	0,9887	
12	Challenges bear despair	3,1714	0,9231	Not Supported	3,1714	0,9231	Not Supported	3,1714	0,9231	Not Supported	3,1714	0,9231	Not Supported
		2,8515	0,9837		2,8889	0,9189		2,9375	1,2833		2,8491	0,9883	
13	Failure diminishes enthusiasm	3,6571	1,2821	Supported t:2,4529	3,6571	1,2821	Not Supported	3,6571	1,2821	Supported t:2,2592	3,6571	1,2821	Supported t:3,292
		3,0396	1,2878		3,4722	1,2758		3,0469	1,2901		2,7925	1,0806	
14	Avoiding eye contacts	3,0286	1,1501	Supported t:3,0183	3,0286	1,1501	Supported t:2,7586	3,0286	1,1501	Supported t:2,3274	3,0286	1,1501	Supported
		2,3564	1,0916		2,25	1,2277		2,4154	1,3097		2,25	1,0266	
15	Incentives prerequisite for success	3,9714	0,822	Supported t:5,1536	3,9714	0,822	Not Supported	3,9714	0,822	Not Supported	3,9714	0,822	Supported t:5,0725
		3,0693	1,0701		3,8333	1,1084		3,6462	1,0815		2,9615	1,0283	
16	If I were Him/her, how would I act?	3,7714	1,1903	Not Supported	3,7714	1,1903	Not Supported	3,7714	1,1903	Not Supported	3,7714	1,1903	Not Supported
		3,7525	0,9634		3,8056	1,3271		3,8	1,1619		4,0189	0,8202	
17	Considering others interest	3,7143	1,1	Not Supported	3,7143	1,1	Not Supported	3,7143	1,1	Not Supported	3,7143	1,1	Not Supported
		3,7624	0,9397		3,8333	1,1588		3,7077	1,1281		3,9245	1,0162	
18	Listening patiently	4,1429	0,7724	Not Supported	4,1429	0,7724	Not Supported	4,1429	0,7724	Not Supported	4,1429	0,7724	Supported t:-2,5659
		4,0297	0,818		3,9722	0,9996		3,9683	0,9995		4,5283	0,5408	
19	Questioning events around	3,6571	0,9684	Not Supported	3,6571	0,9684	Not Supported	3,6571	0,9684	Not Supported	3,6571	0,9684	Supported t:-3,0016
		3,802	0,8605		3,7778	0,9595		3,4286	1,103		4,2264	0,6973	
20	Self-determining "what?" and "what	3,6857	0,9	Not Supported	3,6857	0,9	Not Supported	3,6857	0,9	Not Supported	3,6857	0,9	Supported t:-2,4449
		3,6238	0,8928		3,5278	1,0552		3,6508	1,0026		4,1321	0,7348	

	extent?"												
21	Self-decision in material choice	3,6765	0,9761	Not Supported	3,6765	0,9761	Not Supported	3,6765	0,9761	Not Supported	3,6765	0,9761	-3,2446
		3,697	0,8506		3,5556	1,0541		3,7143	1,142		4,3019	0,6957	
22	Ordering priorities secondaries	3,8857	0,9	Not Supported	3,8857	0,9	Not Supported	3,8857	0,9	Not Supported	3,8857	0,9	Supported t:-3,864
		4,0495	0,9421		4,0286	0,857		3,8413	1,1529		4,5577	0,6076	
23	Interest in getting assigned at group work	3,5143	0,9813	Not Supported	3,5143	0,9813	Not Supported	3,5143	0,9813	Not Supported	3,5143	0,9813	Supported t:-3,4726
		3,5743	0,9731		3,1944	1,2147		3,0635	1,2556		4,1887	0,7353	
24	Regret for others sorrow	3,4571	1,0939	Not Supported	3,4571	1,0939	Not Supported	3,4571	1,0939	Not Supported	3,4571	1,0939	Not Supported
		3,06	1,4272		2,9167	1,3175		3,2381	1,2536		3,6226	1,0419	
25	Contributing group work with proposals	3,8857	1,0784	Not Supported	3,8857	1,0784	Not Supported	3,8857	1,0784	Not Supported	3,8857	1,0784	Supported t:-2,5367
		3,8586	0,8573		3,6389	0,99		3,5397	1,029		4,4038	0,6645	
26	Practising proaction	3,7714	1,0596	Supported t:3,7733	3,7714	1,0596	Not Supported	3,7714	1,0596	Supported t:3,2869	3,7714	1,0596	Not Supported
		2,98	1,0916		3,4	1,2414		2,9683	1,3194		3,3846	1,0319	
27	Benefiting from similar problems	3,9429	0,9375	Supported t:2,7573	3,9429	0,9375	Not Supported	3,9429	0,9375	Supported t:2,6715	3,9429	0,9375	Not Supported
		3,44	0,9025		3,5	1,0823		3,3968	1,0245		4	0,5883	
28	Action before due time	2,5882	1,209	Not Supported	2,5882	1,209	Not Supported	2,5882	1,209	Not Supported	2,5882	1,209	Not Supported
		2,73	1,1622		2,8889	1,1409		2,8889	1,3573		2,6226	0,9452	
29	Practising cause-effect relations	3,8824	0,8796	Not Supported	3,8824	0,8796	Not Supported	3,8824	0,8796	Not Supported	3,8824	0,8796	Supported t:-2,3494
		3,95	0,7961		3,6111	1,0764		3,629	0,9449		4,3019	0,6957	
30	Criticism may source for solutions	3,8529	0,8214	Not Supported	3,8529	0,8214	Not Supported	3,8529	0,8214	Not Supported	3,8529	0,8214	Not Supported
		3,54	0,8924		3,8611	1,0462		3,7619	1,0115		4,1887	0,761	
31	Practising knowledge classification	3,9118	0,7121	Not Supported	3,9118	0,7121	Not Supported	3,9118	0,7121	Not Supported	3,9118	0,7121	Supported t:-3,566
		4,0102	0,7798		3,5833	0,9063		3,746	0,8418		4,434	0,6358	
32	Sellers never criticise own products	2,8857	1,0784	Not Supported	2,8857	1,0784	Not Supported	2,8857	1,0784	Not Supported	2,8857	1,0784	Supported t:2,3562
		3,01	1,1415		3,2778	1,2331		2,7619	1,201		2,3529	0,9555	
33	Education limited in schools	2,8286	1,3609	Not Supported	2,8286	1,3609	Not Supported	2,8286	1,3609	Not Supported	2,8286	1,3609	Not Supported
		2,5556	1,3719		2,9722	1,5581		2,9516	1,6036		2,8868	1,368	

The results of the test concerning the first four items, attempting to test “achievement goal” reveal the outlooks differing from profession to profession. Though all participants have been exposed to the same teaching method, PBL, there appears a difference between the attitudes of DEU-SMBM Nautical Science Students and of Maritime Business Administration students as well as those of Law students in H<sub>11</sub>. Another difference appears between attitudes in H<sub>12</sub> of Nautical Science students and those of Medicine and Law students.

The effects of professional aspects on attitudes appear once more in another set of hypothesis test results, concerning cooperation. The results for H<sub>15</sub>, H<sub>16</sub>, and H<sub>17</sub> reveal different approaches to cooperation in the attitudes of Nautical Science, Medicine, Law and Maritime Business Administration Students.

The primary effects of profession on certain attitudes are revealed also in the results for H<sub>113</sub> “failure puts an end to enthusiasm”. The attitudes of the Nautical Science Students seem to differ from those of Medicine, Law and Nursery students. The same difference appears in H<sub>14</sub> “avoiding eye to eye contact” which also might refer to the likely effects of profession, for the uniformed and strict hierarchical rules nautical science students are exposed to might be effective in this difference. Still another item, H<sub>15</sub> underlining the importance of incentives, reveals the effects of profession.

The result gained for H<sub>126</sub> about proaction seem to be interesting as the attitudes of Nautical Science and Medicine and Law students differ from each other although “proaction” must be regarded inevitable particularly for such disciplines as Nautical Science and Medicine.

H<sub>127</sub> considering the similar problems likely, while solving a problem bears another questionable result. Different approaches to “problem-solving skills” within the groups exposed to the same method, PBL, deserves to be questioned.

As an overall consequence, the hypotheses regarding “achievement goal”, “sharing materials”, “sharing aims”, “self-confidence”, “self-efficacy”, “proaction” and “problem-solving skills” were not supported, which might imply the more effective power of certain professional aspects in establishing and/or reforming certain attitudes.

## CONCLUSION

This study aimed to search for certain practicable and fruitful means to provide masters, as well as officers and engineers, with attitudes required to reach safe, efficient, and effective oceangoing voyages. The attitudes to be formed and/ or enhanced were found to be related with “team work”, “cooperation”, “responsibility”, “self-confidence”, “self-schemas”, “self-evaluation”, “proaction”, “critical thinking”, “problem-solving” and “communication skills”. The search for means to improve such attitudes was focused on teaching/ learning methods, and the basic factors affecting the quality of teaching/ learning methods were highlighted as achievement goals, values and expectations and self-schemas. In addition to these factors, student involvement in the teaching/ learning activities was emphasized if the activities are to fulfill the basic functions expected. Subsequently, the effects of problem-based learning method (PBL) on attitudes were discussed, making use of the results of a questionnaire administered to some nautical science students exposed to PBL and some other groups exposed to traditional teaching/ learning methods. The results of this research revealed that the teaching method employed is likely to play an important role in establishing certain attitudes mainly about “interest in professional issues”, “cooperation”, “fighting against challenges”, “self-confidence”, and “problem-solving skills” On the other hand, the results concerning “self-evaluation”, and “self-regulation” were found to be questionable, for these attitudes are claimed to be some of the primary gainings from PBL. Besides, the overall results revealed the effects of certain regional and national features (peculiarities) on certain attitudes, disregarding the teaching/learning method employed. Another set of results comparing and contrasting the attitudes of nautical science students exposed to PBL and those of some other students studying different disciplines but exposed to the same method, PBL, were discussed. These results revealed the effects of certain professional aspects on such attitudes as “achievement goals” “sharing materials and aims”, “self-cofidence”, “self- efficacy” “proaction” and “problem-solving skills”. While discussing the effects of PBL on forming attitudes, it was concluded that certain professional features might overshadow the likely effects of the teaching/learning method(s) adopted.

## REFERENCES

- **Brown, G. and Atkins, M.** (1994). *Effective Teaching in Higher Education*, British Library Cataloguing, Routledge, London
- **Davies, D.** (1998). *The Virtual University*, Journal of Workplace Learning, Vol-10, Issue 4, MCB University Press
- **Garcia T. and Pintrich PR.** (1994), *Regulating Motivation and Cognition in the Classroom: The Role of Self-Schemas and Self-Regulatory Strategies*, Self Regulation of Learning and Performance Issues and Educational Applications, Edited by Dale H. Schunk and Barry J. Zimmerman, Lawrence Earlboom Associates Publishers Hillsdale, New Jersey.
- **Laurillord, D.** (1993). *Rethinking University Teaching- A framework for the effective use of educational technology*, Routledge, London
- **Pressley, M. and McCormick, C.** (1995). *Cognition, Teaching and Assessment*, Harper Collins College Publishers, N.Y.
- **Ventimiglia, LM** (1995) *Cooperative Learning at the College Level*, Interactive Learning in the Higher Education Classroom/ Cooperative, Collaborative and Active Learning Strategies, Harvey C. Foyle (Editor), The NEA Professional Library Higher Education Series, National Education Association, Washington
- **Wigfield A.** (1994) *The Role Children’s Achievement Values in the Self-Regulation of Their Learning Outcomes*, Self-Regulation of Learning and Performance issues and Educational Applications, Edited by dale H. Schunk and Barry J. Zimmerman, Lawrence Earlboom Associates, Publisters Hillsdale, New Jersey