PROBLEM BASED LEARNING AT MARITIME STUDIES: A CASE STUDY FROM TURKEY

Cpt. Serim Paker[1]
Dokuz Eylul University, School of Maritime Business and Management
İ.İ.B.F. Campus, Dokuzcesmeler , Buca-35160
Izmir / Turkey
Mustafa Kalkan
Dokuz Eylul University, School of Maritime Business and Management
İ.İ.B.F. Campus, Dokuzcesmeler , Buca-35160
Izmir / Turkey

ABSTRACT

Problem Based Learning (PBL) is a learning method based on the principle of using problems as a starting point for the acquisition and integration of new knowledge. PBL has recently been debate of significance in various institutions. It has been practiced to various extends and many benefits has been acquired from PBL comparing with the traditional education systems. Objectives of PBL are to develop knowledge, skills and attitudes of the students. Basically as a "Student Centered" approach it is believed to aim at creating a great deal of changes in the attitudes of the learners. Considering this crucial compliance, School of Maritime Business and Management (SMBM) has decided to adopt this student centered education system. The school aims to provide deck officers for the both International and Turkish Merchant Fleet. Department's curriculum is in compliance with the IMO's STCW'95 conventions. Believing that utilizing this approach, SMBM is going to provide the shipping industry with decently qualified deck officers meeting all the requirements. The overall results aimed through PBL seem to greatly comply with the expectations of merchant fleet for deck officers. The aim of this paper is to give a rough definition and the basic principles of PBL in general and highlight the activities SMBM has completed so far and the prospects to carry out this completely new system to the best possible extend.

Keywords: problem based education, maritime training

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[1] Corresponding author. TEL: +90-232-4204178, FAX: +90-232-4204191
E-Mail: serim.paker@deu.edu.tr

1. INTRODUCTION: Why We Have Shifted To Problem-Based Learning

We have recently decided to make certain radical changes in the education system at our school-shifting from teacher-centered to student-centered approach. By means of this change, the main aim has been planned to focus on the two dimensions of learning reflective learning and metarognitive learning. (Teel, 1999:1) Students will take responsibility for their learning where they use the university as a set of resources largely under their control, inspired but not directed by their teachers, being supported properly in their own exploration of what is known in field, where its frontiers are, and how they might be extended. (Laurillard, 1993:2)

While making such radical changes, we have considered the recent developments in "the focus of university teaching shifting away from the corpus of knowledge in favor of the process of learning, which promotes a new look at teaching and learning in higher education exceeding the mere transmission of knowledge through didactic methods, embracing a more student-centered ideology and incorporating mechanisms for developing intellectual skills and analytical competence." (Evans and Abbott, 1994:46)

Among the reasons enforcing the above mentioned shift, the prominent one lies on the extraordinary nature of expectations from our graduates, particularly those from our Deck Department. An officer on board a vessel is expected to be both a competent leader, the one does right things, and a successful manager, the one who does things right. An officer is also held liable towards both internal customers- the crew in charge on board the ship and external customers- navigational regulations, conventional requirements, owners and/or agents, and shippers and/or charterers. In order to cope up with such heavy and critical liabilities, the officer does need to be provided with not only a wealth of knowledge on his/her versatile career but also certain skills enabling him/her to solve problems and certain attitudes-"of tolerance and civility towards other people, towards the seeking and learning of new skills, and towards such social values as morality."(Gogne, Briggs, and Wager, 1998:84-85)

The experiences we have had so far in various attempts to reach effective teaching have taught us that as long as the goal is "merely conveying information "(Brown and Atkins, 1994:4) rather that producing self-efficious life-long learners, focusing more on declarative, procedural and conditional learning rather than reflective learning and metarognitive learning; putting greater emphasis on direct instruction "rather than guided discovery" (Pressley and Mccormick, 1995:9), we will have difficulties in producing competent and successful seagoing officers. The experiences have also taught us that no matter how hard we try, unless we change the overall education system, we still might fail to successfully include in teaching the fundamental aspects of learning as "apprehending structure" where in focusing on deep approach, and encouraging the "mathemagenic activities giving birth to learning; integrating parts; requiring activities that address and deal with relations; acting on the world of

descriptions focusing on experiential knowledge; using feedback both intrinsic and extrinsic types; and reflecting on goals-action-feedback. (Lavillard, 1994:48-64)

Considering the large scale of liabilities of an officer on board the vessel and the challenging nature of life at sea, we have aimed to provide our students with certain attitudes which are likely to help them cope up with any unexpected barriers and difficulties, cope positively with failures and setback inspire in them, preference for optimal challenge over easy success, autonomous motivation and getting engaged in life-long learning. Besides, we have wanted to focus more on raising certain humanistic attitudes as perceptions in favor of team spirits, group success, the sense of sharing goals, rewards and resources, becoming personally involved with one another and helping one another thus promoting survival. Moreover, we have wanted the enhance and promote our aim in creating self-confidence, self-efficacy and independent thinking in our students. They ought to be confident in holding responsibility for decision making, activate their self-schemas and feel free in displaying their feelings and/or ideas. In addition to these high perceptions of self values, they should be supplied with another important aspect of leadership-communication. More precisely, while leading any group activity, they should learn to listen and consider the interests and concerns of the other group members. In other words, the education system employed should set in the students certain positive attitudes towards exchanging ideas correcting each other respecting and participating group objectives. Another aspect of importance to be planted in the prospective officers is the profound attitude of self-criticism, self-evaluation, self-reflection and self-appraisal. The last but not the least basic attitude we would like to strengthen in our students is proactive seeking out information; controlling, questioning and correcting not only themselves but also their environment; not only reacting when encountered obstacles but also proacting via sound, logical, consistent and rational appraisal.

In this respect, the term “learning" should be emphasized, the atmosphere as well as the contents and the feature of learning activity. To what extent the former is stimulating and humane and the latter is relevant, contextual, active and practicable, to what extend the former is free of anxiety, friendly and encouraging and the latter is collaborative, integrated, interdisciplinary problem -centered, student-centered or teacher-centered etc. are to be of great concern. Another crucial aspect of concern can be highlighted as the extent to which the learner is inclined to not only "what" but also "why"; reflect upon previous knowledge, classify related ideas, highlight positive/negative points evaluate the success, discard inappropriate strategies; think on his/her own rather than simply respond to established/predictable clues; evaluate, interprete, make predictions / assumptions, draw conclusion; precisely stating, activating reflective journal and asking such questions to himself / herself as " What should I continue / stop / start doing and what / how why have I learned ?"

All in all, having reviewed the core aim of “education " in general as facilitating the learners to adopt certain knowledge, skills and attitudes, we have simplified our

view and overall aim addressed to the undergraduates studying at our Desk Department. In terms of knowledge, students should be made aware that knowledge needed to carry out certain activities is limited, hence they should be able to determine themselves what kind of knowledge and how much of it they need to fulfill any task(s) assigned; they should also be able to find the way to reach that knowledge themselves. Keeping in mind that new knowledge can be built on previously existing knowledge they should also be able to reflect upon their previous knowledge and / or experience. As far as the skills are concerned in general, they ought to be used efficiently in retaining knowledge longer, integration and transferring knowledge to new problems and / or situations (phenomena). As far as the attitudes to be provided for students are concerned, they can be highlighted as tendency towards goal - oriented learning rather than performance-oriented one (Meece,1994:26); interest in principles of cooperative learning; getting motivated intrinsically; activating self-schemas and thus acting in the push of self-confidence, self-efficacy and independent thinking; adopting the principles of critical thinking, meanwhile self-criticism, self-evaluation and self-appraisal; acquiring the positive aspects of good communication, and adoption of observing, understanding, questioning, correcting, that is predicting and appraising the environment and eventually proacting.

Having reviewed our overall aims at bettering and in the course of time perfecting the quality of our graduates as seagoing officers, and reevaluating and reconsidering the fundamental prerequisites of effective teaching and learning, we have decided to shift to the " problem based learning," where learning is based on a specific and well-designed problem. The basic principle behind this method is triggering certain motives and create curiosity in learners which activate interest and desire towards learning. Through designing well-thought problems and facilitating decent and stimulating learning atmospheres, the learners can be provided with desired knowledge, skills and attitudes.

2. SOME HIGHLIGHTS ON PROBLEM-BASED LEARNING(PBL)

As the term itself suggests PBL is a means of learning which is basically based on a problem. The problem stands for the stimulating aspect of the learning activity. In other words, it raises certain desire, wonder, and interest in the learner. The idea behind this philosophy must be that learning is inspired towards what is needed to be uncovered, what attracts interest and what creates certain desire and enthusiasm in the audience. It is commonly accepted that one is most likely to try to learn what he/she has questions in mind about, finds mysterious and interesting, threatening or useful, etc. Therefore, in order for any learning activity to take place, there must be at the stage a motive, desire and interest, i.e. intrinsic motivation. These incentives are raised by the problem, which must be designed in accordance with the specific goal aimed. The problem also "serves a challenge to students reasoning or problem-solving skills as an organizer for their learning. The only way to discover what you already know, what you have really stored

in your memory, is to work with a problem." (Dolmans and Schmidt, 1994:372) Another importance function the problem serves is to encourage self-directed learning skills. “When students discuss a problem, they ask themselves whether or not their knowledge and skills are adequate to deal with this problem. This provides them with both a sense of direction and the depth of study that needs to be undertaken. Through problem discussion, students identify their own learning needs and formulate these as learning issues. These issues are listed and serve as guides for what they should learn during self-study. The main advantage of encouraging self-directed learning skills is that students learn how to deal with problem in the future, preparing themselves to become independent, life-long learners." (Dolmans and Schmidt, 1994; 373)

As Dolmans and Schmidt (1996:535) make it clear, the problems which students tackle in small groups under the supervision of a tutor consist of description of a set of phenomena or events that can be perceived in reality and these phenomena have to be examined by the tutorial group in terms of their underlying principles, mechanisms or processes. They rightfully also claim that this style of learning increases retention of knowledge, improves problem-solving skills, enhances integration of basic science concepts, develops self-directed learning skills, and strengthens intrinsic motivation.

As far as the types of the problems are concerned, Barrows (1984:16) is right to have stated that they can be questions to be answered; observations, symptoms, signs or experimental results to be explained; even equations to be derived. Although the types vary, however, certain principles should be kept in mind while designing a problem to be used in problem-based learning. They are, according to Dolmans; Balendong and Wolfhagen (1997:185,186) as follows: the content of a case should adapt well to students’ prior knowledge; it should contain several cues that stimulate students to elaborate; the context should be relevant to the future profession; it should have relevant basic sciences concepts to encourage integration of knowledge; it should stimulate self-directed learning; it should enhance students’ interest in the subject matter, by sustaining discussion about possible solutions and facilitating students to explore alternatives; and it should match one or more of the faculty objectives.

The essence, or the fundamental base, of PBL lies on meeting the three basic conditions that facilitate learning. The three principles playing a major role in acquiring new information are activation of prior knowledge, encoding specificity, and elaboration of knowledge (Schmidt, 1983:12).The idea behind the first principle is exemplified in the mentioned article which compares the learning results of a first year student with that of a fourth year student both of whom are assigned to read an interpret the same article. The results are found to be in favor of the fourth year students as their more elaborated prior knowledge will enable them to process the new information more easily, efficiently and fruitfully. The second principle, encoding specificity, is related with the resemblance between the situation in which something is learned and the situation in which it is applied. The closer the resemblance is the better the

performance. The third principle, elaboration of knowledge, is fulfilled through various means such as answering questions about a text, taking notes, discussing subjects matter with others, writing summaries, teaching peers what has been learned, and formulating and criticizing hypotheses. All in all, the mentioned three principles ought to be complied with in optimizing learning." Education should help students in activating relevant prior knowledge, provide a context that resembles the future professional context as closely as possible, and stimulate students to elaborate on their knowledge. (Schmidt, 1983:12)

Considering the essential core and principles of learning, PBL is based on seven steps. It starts with a problem called a scenario, designed carefully in accordance with the basis of the curriculum. The tutorial group of around 8-10 students are assigned to explain the phenomena in terms of underlying processes. **The first step** involved is "clarifying vague phrases, terms concepts used in the problem". In other words, making the explanation of the problem clear and comprehendible. Group members' relevant knowledge and any other sources available can be made use of to clarify the contents of the problem. **The second step** is to define the problem; i.e. the phenomena to be explained are described. " Which phenomena have to be explained ?" is the question to be answered at this step**. The third step** is analyzing the problem. The careful analysis results in ideas and suppositions about the structure of the problem. The ideas and suppositions are usually based on prior knowledge and rational thought. Making use of the prior knowledge, the group tries to formulate relevant hypotheses based on sound reasoning. A kind of brain-storming allows the individuals to put forward their ideas, knowledge and hypotheses. **The fourth step** comprises drawing a systematic inventory of the explanations proposed at the previous step. More precisely the members of tutorial group try to come to a coherent description of the processes underlying the phenomena so that they can establish their study priorities. **The fifth step** is formulating the required learning objectives. The objectives to be concentrated on are established, and a distribution of tasks is agreed on. Meanwhile, the resources to be made use of are discussed as well. As it has been observed by the author/s and as Schmidt points out (1990:6) experienced "groups soon turn the procedure into something that enables them to get to the main point fast. This implies that steps 3, 4 and 5 are often taken simultaneously."The blackboard is divided into three columns filled with information from left to right. The first column, called "phenomena" summarizes the results of step 2 the second column, called "explanations" includes hypotheses, suppositions and ideas; and the third column is called " Learning objectives." **The sixth step** is devoted to self-study. Regarding the learning objectives, the members of the group try to collect information making use of any sources they can reach. In **the seventh step**, the members report their findings, they inform one other about their individual findings These findings are grouped, integrated and checked whether they are enough for the group to describe the phenomena. In case the findings

are found insufficient, the group may decide to improve their study to a deeper level of understanding. The second proposal usually starts the process from the fourth step and aims to enable the group to perform the analytical and explanatory task in a more satisfactory way.

Schmidt (1983:15) gives a good example for a proper case leading to problem-solving activity. He proposes “you have been playing a game of tennis. You have a red face and are wet all over your body. How can these phenomena be explained?" rather than study he heat-regulating mechanism of the human body." He also adds that problems have to be formulated concretely; they should have degree of complexity adapted to students’ prior knowledge; they should have the greatest frequency in the usual practical setting.

3.HOW WE HAVE STARTED PROBLEM-BASED LEARNİNG

Problem-based learning approach, a kind of active learning, actually is not new to our university, Dokuz Eylul University. It was adapted by our School of Medicine seven years ago since then this approach has been practiced and improved at this school. As it was found a lot more suitable and fruitful, it was adopted by several other units of our university. And the most recent adoption has been verified at our school, School of Maritime Business and Management, comprising two departments-Maritime Business Administration Department and Deck Department.

3.1 Preparation Period: Over one year we have established close contacts with the School of Medicine, and carried out mutual visits, and had an opportunity to find out what actually the new approach is and how it works. Not only have we searched for the theoretical feature of the system, we have also observed the practical aspects. The preliminary search we have had on the academic staff as well as the students who have been involved in the new approach has made it clear that this approach will definitely bring distinguished progress in the quality of our graduates in terms of gaining proper knowledge with respect to their profession, required skills which will lead them to be life long-learners and acquire the desired attitudes.

3.2 Shifting to PBL: Having decided to make a radical change in our education system, we have taken various further solid steps in addition to keeping the progress in getting well informed in terms of theory and practice. The very first solid step taken has been devoted to redetermine and rebrush a detailed list of expectations from our students when they have graduated. A kind of brain storming has accompanied a qualitative research carried out with the industry where our graduates will be employed. A review of our overall curriculum has followed these researches and findings. The curriculum and the findings have been matched to the best possible extent. Having rearranged the curriculum, the pacing schedule has been integrated to the new body. And based on the solid pacing schedule and the curriculum aimed, hundreds of rough problems have been designed. The problems have been scrutinized,

filtered and brushed through numbers of meetings brain -storming and discussions. In the meantime, both the academy and the students have been trained to make them well informed about the essence of the new system.

We are about to move to a new building which has been well-designed in accordance with the requirements of the new system. Certain rooms have been planned so as to serve the tutorial groups of 8-10 students each. The library of our school has been re-arranged in terms of both design and contents. The sources encouraging self-study have been enriched enormously. A group of academy has been assigned to deal with providing the materials which will be needed by the tutorial groups to refer to.

Having examined the relevant practices deployed by the units at our university, which have been teaching through problem-based learning method, we have tried to adapt them to fit to our own body and aim.

3.3. Some Sample Tentative Scenarios Planned To Be Proposed to Tutorial Groups in Early 2002-2003 Academic Term : A sample scenario will be presented at the session

4. COCNLUSION:

The overall aim of education is believed to provide the learners with certain proper knowledge, desired skills and profound attitudes. And the fundamental of education, in broad sense, has got to be structured in compliance with the targeted needs of the learners. This means that as the needs change, the relevant education system has to change so as to meet the new terms.

The recent rapid advances in technology have increasingly changed almost all aspects of human-life and thus accelerated the required changes in teaching and learning approaches. Particularly since the last quarter of the 20'th century, it has been clearly seen that a means of transferring knowledge from an instructor to the passive learner can never cope up with the outstanding changes in needs Thus it has become inevitable for the learner to take an active role in and shoulder the greatest part of the responsibility in teaching learning activity. He / she has been placed at the center of the activity so that the whole activity can proceed under his / her control, based on his / her specific needs and preferences. Since the learner neither can nor does to be loaded with all sorts of knowledge available, he/ she should himself / herself determine the limits of the knowledge needed. He / she should decide on the learning objectives and also on the way to access those objectives. Through practicing the mechanism of self-appraisal, he / she should be able to correct and improve himself/ herself. In other words, he / she should actively take part in learning activities and eventually become a life-longer learner. The instructor's and/ or the education institutions' role in this activity should be confined to act as an efficient facilitator rather than a knowledge-conveyor.

The new approach mentioned above has become quite popular since it first started at the Faculty of Medicine at McMaster University in Canada in the mid.1960's. With its various adaptations, it has been implemented in many Canadian, American and European universities.

For the last seven years; the student centered, problem based and small-group learning has been in practice at our university, Dokuz Eylül University, İzmir. Led by our Faculty of Medicine seven years ago, several other faculties at our university have adopted this instruction approach. And so has our school. From the physical conditions to the contents of self-access materials and to the overall curriculum and pacing schedule, a great number of changes have taken place at our school in order to get the utmost benefits from the new method.

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