

ORIGINAL RESEARCH PAPER

Task-Based Learning Programme for Clinical Years of Medical Education

HASAN OZKAN, BERNA DEGIRMENCI, BERNA MUSAL,
OYA ITIL, ELIF AKALIN, OGUZ KILINC,
SEBNEM OZKAN & EMIN ALICI

Dokuz Eylul University School of Medicine, Izmir, Turkey

ABSTRACT **Context:** *Task-based learning (TBL) is an educational strategy recommended for the later years of the medical education programme. The TBL programme was adopted for clinical years in the 2000–2001 academic year in Dokuz Eylul University School of Medicine (DEUSM).*

Objective: *The aim of this paper is to describe the TBL programme of DEUSM.*

Methods: *DEUSM outlined 50 clinical tasks for fourth-year students and 37 for fifth-year students. The tasks were grouped into four and five blocks. Interdisciplinary practicals, lectures and patient visits were organised in each task's schedule. The tasks were the focus of learning and each discipline contributed its own learning opportunities to the attached tasks. Formative and summative methods were used to evaluate the programme.*

Conclusion: *Based on the experience and feedback provided by the students and trainers, the authors considered TBL an applicable and advisable approach for the clinical years of medical education.*

KEYWORDS *Task-based learning, problem-based learning, student study guides.*

Introduction

Major changes in educational strategies have been recommended in the curriculum of medical schools over recent decades (General Medical Council, 1993). One approach is the SPICES model which consists of six different educational strategies: student-centered, problem-based, integrated, community-based, core with electives, and systematic (Harden *et al.*, 1984). Task-based learning (TBL) was first described by Harden in 1988 (Parry, 1989). TBL is a strategy for the clinical clerkship period in medical schools. In this strategy, there is a commitment to problem-based learning (PBL) and integrated

Author for correspondence: Berna Musal, Dokuz Eylül University School of Medicine, Medical Education Department, 35340, Inciralti, Izmir, Turkey. Tel: +90 232 4124680. Fax: +90 232 2590541. E-mail: berna.musal@deu.edu.tr

teaching with a multidisciplinary clinical experience that result in rich learning opportunities (Harden *et al.*, 1996; Harden *et al.*, 2000; Race, 2000). The strategy seems to correlate with the recommendations of the General Medical Council which emphasizes a move towards “true integration of the course, both horizontal and vertical, using the term in the sense of interdisciplinary synthesis and not simply coordination or synchronisation of departmentally based components” (General Medical Council, 1993).

In 1996, the Academic Assembly of Dokuz Eylül University School of Medicine (DEUSM) decided to change its educational system to an active one, with the aim of enhancing the quality of medical education. DEUSM recruits 120 new students every year. The MD degree programme lasts six years in Turkey. In 1997, the curriculum of the DEUSM was changed according to the principles of PBL. In the first three years of the curriculum, the students learn about the normal and abnormal structure, functions, and behaviors using the PBL method. Due to the difficulties experienced in the implementation of PBL during the clinical clerkships, the TBL method was adopted for the 4th and 5th years of the curriculum. During the sixth year, students work as interns in clinics and hospital wards. The objectives of the clerkship are to develop clinical skills and experience and professional attitudes and behaviours. In the SPICES model for educational strategies, PBL is presented as a continuum. Harden *et al.* described steps in the continuum between PBL and information-oriented learning. These steps are: theoretical learning, problem-orientated learning, problem-assisted learning, problem-solving learning, problem-focused learning, problem-based mixed approach, problem-initiated learning, problem-centred learning, problem-centred discovery learning and problem-based learning (Harden & Davis, 1998). TBL is the final step at the PBL end of the spectrum. Although PBL and TBL share some common principles, like focusing the learning on a problem or clinical situation, building new knowledge on students’ prior knowledge, active learning, and a student-centered approach, there are some differences between them. PBL scenarios are designed to arise from student curiosity and to lead them to produce learning objectives. The students usually learn in groups in PBL. The PBL strategy seems more appropriate for preclinical years of medical education. In TBL, students meet the patients in real clinical settings, learn about the tasks, understand the concepts and mechanisms underlying those tasks, apply their knowledge and skills in different contexts, and acquire general competences. Learning objectives in TBL are more explicit than in PBL. The students usually learn individually in the TBL strategy (Harden *et al.*, 1996; Harden *et al.*, 2000; Race, 2000; Harden & Davis, 1998). It offers an opportunity to increase the relevance of clinical learning to clinical practice (Race, 2000).

TBL was initially implemented in the School of Medicine at Dundee, Scotland, UK. One hundred and thirteen tasks, arranged in 16 groups, serve to integrate the student learning as they rotate through 10 clinical attachments. According to this study, clinical attachments in individual disciplines can offer

rich learning opportunities and can play a role in an integrated as well as in a traditional curriculum (Dundee Undergraduate Medical Curriculum, 1998/99). A different form of TBL strategy was reported by Virjo *et al.* at the University of Tampere, Finland. In this study, a TBL study module was built in only the general practice module, not for all the curriculum of clinical education. Eighty-five students participated in this study between 1998 and 1999. The results of the study showed that this method was functional and conducive to learning. Compared to the beginning of the study module, students' perceptions of their skills regarding general practitioners' work were improved (Virjo *et al.*, 2001).

In the 2000–2001 academic year, DEUSM started the implementation of TBL in its clinical years' curriculum (Ozkan *et al.*, 2004). Based on the interdisciplinary characteristics of the schedule, practicals, bedside visits and assessment methods, DEUSM's TBL programme can be perceived as an original programme in the field of clinical clerkship education. The aim of this article is to present a detailed description of DEUSM's programme including its advantages and constraints in implementation.

Organization and Description of TBL Programme in DEUSM

In August 1998, the education committee for clinical clerkships of DEUSM was established and started to organize the new education programme for the clinical years of PBL students. Goals and objectives for the fourth and fifth years of the educational programme were determined in light of the first three years' preclinical programme. Educational programmes of several medical schools in the world were reviewed and discussed. At the end of these studies, TBL was selected and blocks of learning tasks were formed based on symptoms associated with different systems of the body. TBL programme's design and implementation are in accordance with the school's vertically and horizontally integrated curriculum. The tasks in the curriculum were determined based on views of relevant medical disciplines and a survey of most frequently encountered symptoms in the community. The general practitioners working in the province of Izmir were asked to complete the survey. With the approval of departments and the curriculum committee, appropriate tasks were determined.

Criteria for the selection of a task are shown below:

- The task deals with a common problem in the community
- The task is an appropriate focus for learning clinical medicine
- The task provides the required knowledge, skill, and attitude
- The task provides integration of clinical and preclinical subjects.

Initially, one hundred clinical tasks were derived as the focus of learning. However, to make the list more manageable, it was reduced to 87. During the 4th and 5th years' programmes, six to eight students in each task group rotate

through different educational blocks. The task lists of the 4th and 5th years' blocks are given in Appendices 1 and 2. Interdisciplinary practicals, lectures and bedside visits are organized in the tasks' schedules. The tasks mainly depend on bedside visits and to a lesser extent on patient encounters at the outpatient clinics. When the specific task-related patients are not available, existing patient files and video recordings are used.

The tasks are carried out through interdisciplinary connections. During the development of the TBL programme, the educational programme of the first three years is taken into account for a seamless integration of basic and clinical issues. Every week, one or two tasks are implemented in small groups. Each task has a student study guide (SSG) prepared by the faculty of different departments. The main goal of the tasks is to provide adequate knowledge for students about diagnosis, differential diagnosis, and treatment approaches of patients presenting with the same symptom. For instance, SSG and the "cervical and lumbar pain" task were jointly prepared by a group of physicians from the Departments of Physical Therapy and Rehabilitation, Rheumatology, Orthopaedics, and Neurosurgery and were reviewed by the educational staff of related Basic Sciences. The weekly schedule of the "cervical and lumbar pain" task is given in Appendix 3. The fact that patients with locomotor system diseases presenting with similar symptoms may receive different treatments from different disciplines led to the development of interdisciplinary tasks. Tasks are predominantly designed to enable students to follow patients with similar symptoms in different clinics and learn about different diagnostic and treatment approaches. For instance, lumbar pain of a patient may be due to various causes like discal hernia, infection, or tumour. Treatment methods of these problems are also different. Visits to different departments are carried out in order to show the students conservative and surgical treatment algorithms of patients with the same diagnosis. Consequently, students are able to understand different treatment modalities in the course of a single task. Tasks' training teams consist of specialists from different disciplines. As another example, while performing the task of "cough" at the chest clinic, students visit and evaluate a patient with a cough at the otorhinolaryngology clinic under the guidance of local trainers. Thus, students integrate the perspectives of different disciplines. At the end of the academic year, students are expected to have a holistic, transdisciplinary approach.

Due to their characteristics, SSGs make an important contribution to learning by directing students to learning objectives; standardizing required knowledge, skills and attitudes; identifying student activities relevant to the objectives; and providing a list of resources (Harden *et al.*, 1999). At the beginning of each block, students are provided with SSGs, practicals cards, case follow-up file formats, feedback forms, and weekly schedules. The task convenor presents the task to students at the beginning of each week and they are assigned to a patient related to their task. Students are responsible for the follow-up of these patients during the whole week. The task convenor selected

from the department that contributes the most to the functioning of the task coordinates the activities of students among the different departments.

The distribution of the weekly programme is as follows; 20% lectures, 20% time allocated for independent learning, and 20–25% bedside visits with clinical trainers. Interdisciplinary studies and community-based activities are also involved.

In addition to the blocks consisting of different tasks, two elective courses are scheduled within the 4th and 5th years' programmes. During the elective courses, students have the opportunity to further their knowledge and skills in their areas of interest and gain information on the clinical procedures of the departments.

Evaluation

Formative and summative methods are used for student assessment. The educational activities and feedback from trainers and peers lead the students to identify their learning needs. During the task-end discussion session designed for the overall evaluation of students' task performance, task convenor and students discuss basic and clinical sciences-related questions prepared within the framework of SSGs and students have the opportunity to identify and complete learning gaps. The task convenors, using a five-point scale, evaluate students' task week and discussion session performance. The average of each student's task-end grades is calculated to determine their overall grade at the end of each block.

The items and their relative impacts on the composition of the block passing grade are as follows: average task-end grades 20%, Objective Structured Clinical Examination (OSCE) 30%, and theoretical examination (MCQs) 50%. Out of a total score of 100, 60 is the passing grade and 50 is the minimum grade to pass the theoretical examination and OSCE.

Between the years 2001 and 2003, the 4th and 5th years' grade averages were 72.7–76.0 and percentages of passing students were 83–86%.

Oral and written feedback on task-related activities and the performance of trainers are given by the students at the end of each task.

At the end of each year, students evaluate the TBL programme. On a five-point scale (1: min, 5: max), average student ratings for educational activities, methods, and tools varies between 2.68 ± 1.12 and 3.48 ± 1.04 for the year 2002, and between 2.89 ± 1.20 and 3.64 ± 1.04 for the year 2003 (see Table 1).

The highest score is attributed to SSGs which provide the objectives of the task, information about the working plan, and a list of resources. The efforts to improve SSGs and in-service training of trainers to raise their awareness on the use of these guides are considered to have a beneficial effect on their use.

The lowest score was attributed to patient encounters in outpatient clinics. In responses to open-ended questions, students expressed that the scheduling of

outpatient clinics to the afternoon hours constrained the number and variety of cases.

Between 2002 and 2003, the scores attributed to task-end discussion sessions increased significantly. This may be due to the fact that instructors were trained to transform the sessions into a learning environment favouring student development.

On the five-point scale, the average scores attributed by students to academic support and facilities ranged between 2.74 ± 1.20 and 3.65 ± 0.97 in 2002, and between 2.70 ± 1.26 and 3.73 ± 0.95 in 2003 (see Table 2).

The lowest score was attributed to social activities and the highest score to communication with trainers. The students expressed their wish for the

Table 1. Average points attributed by the students to educational activities, methods, and tools

Educational activities, methods and tools	Average points*		<i>p</i> value**
	2002	2003	
Bedside theoretical	$3.45 \pm .95$	3.53 ± 0.92	0.387
Lectures	3.43 ± 0.91	3.59 ± 0.96	0.088
Independent study	3.35 ± 1.22	3.58 ± 1.20	0.073
Outpatient clinic	2.68 ± 1.12	2.89 ± 1.20	0.087
Practicals	3.12 ± 0.94	3.28 ± 0.98	0.115
Student study guides	3.48 ± 1.04	3.64 ± 1.04	0.137
Task-end discussion sessions	3.13 ± 1.18	3.40 ± 1.02	0.013***
Block-end assessment	3.39 ± 1.01	3.52 ± 0.97	0.200
Overall assessment of all educational activities	3.40 ± 0.83	3.41 ± 0.82	0.906

*(1: min, 5: max). **Independent Samples *t*-test. *** $p < 0.05$.

Table 2. Average points attributed by the students to the support and facilities provided by DEUSM

Academic support and facilities provided by DEUSM	Average points*		<i>p</i> value**
	2002	2003	
Priority of student education in DEUSM	3.21 ± 0.99	3.18 ± 1.06	0.778
Level of meeting student needs	3.16 ± 0.99	3.07 ± 1.07	0.425
Communication with trainers	3.65 ± 0.97	3.73 ± 0.95	0.421
Physical conditions of the library	3.58 ± 1.07	3.58 ± 1.02	0.963
Learning resources of the library	3.51 ± 1.01	3.53 ± 1.08	0.884
Computer facilities	3.33 ± 1.22	3.40 ± 1.17	0.614
Social activities	2.74 ± 1.20	2.70 ± 1.26	0.661

*(1: min, 5: max). **Independent Samples *t*-test.

development of student clubs and the improvement of the diversity and quality of social activities which are part of the weekly curriculum and regularly take place two hours a week.

Clinicians are primarily responsible for training 4th and 5th year students. The attribution of fairly high scores for clinician trainers who work at intensive pace and carry out several duties like training, research and patient care, can be evaluated as a positive reflection of trainers' performance and devotion to training. For faculty orientation, TBL courses were organized by the Training of Trainers Committee. During early implementation, major criticisms included insufficient time allocated for each discipline and constraints on teaching in one's field. But in time, faculty realized that the sequence of tasks enabled students to gain sufficient knowledge and skills in their respective disciplines.

In DEUSM, detailed job descriptions for task convenors and trainers, flow-charts for task procedures, and in-service training for trainers were envisaged to minimize the problems likely to arise from the complex interdisciplinary structure of the TBL programme.

In general, students' scores for educational activities, academic support, and facilities in DEUSM were above the midpoint of the scale.

At the end of each academic year, the scores given by the students to the above mentioned rating scale and their answers to the open-ended questions are evaluated in relevant educational committees and guide the programme evaluation studies. The educational committees endeavour to solve the problems brought forward by the students. The attainment level of programme objectives is continuously being reviewed by block and year committees, proposals are submitted to the Curriculum Committee which finalizes the revisions.

Advantages and Constraints of the TBL Programme

In the light of specific student and trainer feedback, some advantages and constraints of DEUSM's TBL programme are given below.

Advantages:

1. TBL in small groups provides a positive learning environment for students.
2. The coaching role of trainers strengthens trainer-student relationships and creates a positive and effective learning environment for students.
3. Student performance is closely monitored and evaluated by trainers.
4. The interdisciplinary approach enables students to learn a clinical case in its entirety and to synthesize various aspects of a single case.

Constraints:

1. Trainers' ad hoc duties, like emergency medical interventions, may restrict trainers' compliance with the task schedule.

2. Some of the novice trainers have difficulty understanding the principles and implementation methods of TBL. Frequent reminders like workshops and courses are necessary.
3. The examinations (OSCE and MCQ theoretical examination) applied at the end of each block are quite challenging for the students since they include questions dealing with many tasks.

Conclusion

TBL was structured as a continuum of the existing preclinical PBL programme in DEUSM. Five years' experience demonstrated that TBL, as an alternative educational model for clinical clerkship, facilitated the integration of pre-clinical and clinical components of the curriculum within a flexible framework, contributed to the acquisition of holistic and interdisciplinary approaches, enhanced student motivation and satisfaction, and promoted student learning.

The TBL programme in DEUSM is continuously being revised for improvement. Cooperative efforts of relevant educational committees, student and trainer feedback, attainment level of programme objectives and administrative support are essential elements of the programme evaluation process.

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Appendix 1 Tasks of different blocks in 4th year of medical education

Tasks of Respiratory – Cardiovascular Systems and Fever Block (9 weeks)

Cough	Hypertension
Palpitation	Leg pain
Easy fatigue	Chest pain
Hemoptysis	Dyspnea
Wheezing	Fever

Tasks of Gastroenterology – Masses Block (8 weeks)

Jaundice/ascite	Change in bowel habit (diarrhea/constipation)
Abdominal pain and mass	Cervical mass
Hematemesis, melena, hematochesia	Lump in breast

Tasks of Genitourinary–Endocrinology–Haematology Systems Block (8 weeks)

Haematuria	Galactorrhea/dry mouth
Voiding disorders	Pallor/fatigue
Erectile disfunction	Lymphadenopathies
Oliguria	Coagulation disorders
Oedema	

Tasks of Paediatrics Block (8 weeks)

Newborn/jaundice/sepsis	Growth retardation
Cough	Normal newborn
Dyspnea	Resuscitation/basic life support
Cardiac murmur	Nutrition
Oedema	Prophylaxis from accidents
Cyanosis	Hypotonic baby
Pallor	Motor-mental retardation
Coagulation disorder	Throatache
Confusion	Ear ache
Swollen joint	Pubertal disorders
Vaccinations	Shortness in length
Normal growth and development	Approach to dismorphic child
	Approach to emergent child

Elective Course (4 weeks)

Appendix 2 Tasks of different blocks in 5th year of medical education

Emergency Medicine Block

Course: 2 weeks

Course on emergency management in trauma

Tasks: 6 weeks

Forensic medicine course

Hospital stabilization

CPR

Late complications

Cyanosis

Intoxication

Management in

medico-legal death

Tasks of Dermatology–Locomotor Systems Block (8 weeks)

Mass

Scale

Blister

Wound

Soft tissue pain/spinal
cord injuries

Painful and swollen joint

Cervical and lumbar pain

Disorders in walking and
deformities

Tasks of Neurology–Psychiatry Block (8 weeks)

Hemiplegia

Cranial nevre

Headache

Syncope

Enuresis

Affective disorders

Reality test disorders

Anxiety disorders

Tasks of Gynaecology and Obstetrics Block (8 weeks)

Normal pregnancy, nausea and bleeding in pregnancy

Hypertension in pregnancy

Labor, dystosia, postpartum haemorrhage

Pelvic pain and dysmenorrhea

Family planning

Reproduction period,
periodic follow-up of
woman and gynaecologic
carcinomas

Abnormal menstrual
bleeding, leak

Interruption of menstruation

Reproduction endocrinology

Tasks of Otorhinolaryngology–Ophthalmology Block (4 weeks)

Red eye

Impaired vision

Hearing loss – tinnitus

Throatache

Elective Course (4 weeks)

Appendix 3 Weekly Schedule of Cervical and Lumbar Pain Task

Monday	Tuesday	Wednesday	Thursday	Friday
Initial meeting (task convener) Bedside visit (Orthopaedics)	Preparation of case files by students Bedside visit (Orthopaedics)	Preparation of case files by students Bedside visit (Physical Therapy & Rehabilitation)	Preparation of case files by students Bedside visit (Orthopaedics)	Preparation of case files by students Bedside visit (Rheumatology)
Lecture Lunch Lecture	Lecture Lunch Practical (Orthopaedics)	Lecture Lunch Sociocultural activities	Lecture Lunch	Lecture Lunch
Independent learning	Practical (Physical therapy & rehabilitation) Practical (Radiology, Nuclear Medicine) Independent learning	Outpatient clinics (Rheumatology) Case discussion (Orthopaedics)	Outpatient clinics (Neurosurgery) Independent learning	Task discussion session