

# Learner centred approaches in medical education

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Medical education is a lifelong process embracing pre-medical experience, undergraduate education, general clinical training, specialist or vocational training, subspecialty training, and continuing medical education. Although medical education was once seen as the province of medical schools and teaching hospitals, large and increasing numbers of practitioners now provide teaching and promotion of learning outside the traditional environment.

Over the past decade both the university sector and the NHS have seen considerable change and increased accountability for their activities, and all the signs suggest that the next 10 years will be no different. Simultaneously, medical schools are having to acknowledge the implementation of new curricula, the consequences of new health service priorities, an increase in the number of medical students, and the implications of the report from the National Committee of Enquiry into Higher Education, chaired by Sir Ron Dearing.<sup>1</sup>

The most recent recommendations of the General Medical Council's education committee were intended to promote an approach to undergraduate medical education and to give a perspective on its aims, which differ substantially from those of traditional curricula.<sup>2</sup> Although the 13 principal recommendations are now well known, at the core is the promotion of the merits of learner centred and problem oriented approaches to learning, which aim to produce doctors better equipped with the adult learning skills necessary for them to adapt to, and meet, the changing needs of the community they serve.

The pedagogic shift from the traditional teacher centred approach, in which the emphasis is on teachers and what they teach, to a student centred approach, in which the emphasis is on students and what they learn, requires a fundamental change in the role of the educator from that of a didactic teacher to that of a facilitator of learning.<sup>3</sup>

## Summary points

Self directed learning involves the learner as an active participant and encourages the development of a deep approach to learning

Self directed learning is the educational strategy most likely to produce doctors prepared for lifelong learning and able to meet the changing needs of their patients

Problem based learning and guided discovery learning are two instructional strategies that exploit the merits of a learner centred approach

Problem based learning is gaining in popularity as both an educational method and a curricular philosophy particularly suited to professional education

In guided discovery learning a mixed economy approach is used in which the best of traditional methods are combined with more innovative approaches to provide a learning environment conducive to deep learning

The move to learner centred strategies has major implications for faculty development at all levels from the institutional to the individual

Our aim was to explore some of the student centred approaches to learning being implemented and the underlying educational theory and concepts on which they are based.

## Methods

Often no clear distinction is made between the aims and objectives of educational provision and the strategies adopted for their achievement; educational concepts may become ends in themselves, and the overall aim becomes lost. Student centred learning, self directed learning, or problem based learning are descriptions often applied without full appreciation of the process or concepts on which they are based or an understanding of what is being achieved in practice. It has been suggested that all too often these descriptions are applied inappropriately and may sometimes be little more than a thin veneer to an otherwise unchanged curricular process.<sup>3</sup>

In selecting references for this review we have tried to provide a balanced, evidence based perspective from key primary sources and major authoritative reviews. The reviews may also provide access to more detailed information.



LANE PAYNE

**Box 1—Key elements of self directed learning**

The learner takes the initiative for:

- Diagnosing learning needs
- Formulating goals
- Identifying resources
- Implementing appropriate activities
- Evaluating outcomes

**Box 2—Principles of adult learning**

Adults are motivated by learning that:

- Is perceived as relevant
- Is based on, and builds on, their previous experiences
- Is participatory and actively involves them
- Is focused on problems
- Is designed so that they can take responsibility for their own learning
- Can be immediately applied in practice
- Involves cycles of action and reflection
- Is based on mutual trust and respect

**Self directed and deep learning**

Self directed learning is when students take the initiative for their own learning: diagnosing needs, formulating goals, identifying resources, implementing appropriate activities, and evaluating outcomes. The key features of self directed learning (box 1) concord with the principles of adult learning<sup>4</sup> (box 2) and the findings of research in cognitive psychology.<sup>5</sup>

Self directed learning is an active process. It encourages the adoption of the deep approach to learning first described in the mid 1970s. Deep learning, as opposed to surface learning, is an active search for understanding. Surface learning merely encourages students to reproduce what has been learnt.<sup>6</sup>

Research has identified the student's approach to learning—surface or deep—as the crucial factor in determining the quality of learning outcomes.<sup>7</sup> A surface approach is common in courses that have a heavy workload, an excessive amount of course material, little opportunity to pursue subjects in depth, little choice over study topics, and an assessment system that provokes anxiety and mainly rewards reproduction of factual information. Courses that foster deep learning, however, commonly provide a context in which students are motivated by the need to know, active learning and exploratory work in small groups, and a well structured knowledge base.

Self directed learning is suggested as the most efficacious approach for the continuum of medical education, particularly when learning is based on experience, and new knowledge and understanding can be integrated into the personal and professional context of the individual.<sup>8</sup>

Strategies that have been developed as self directed learning include:

- Problem based learning
- Discovery learning

- Task based learning
- Experiential and reflective learning
- Portfolio based learning
- Small group, self instructional, and project based learning
- Peer evaluation and learning contracts.<sup>9–12</sup>

**Problem based learning**

Problem based learning has been described as one of the most significant developments in professional education.<sup>13</sup> It has been endorsed by bodies such as the World Health Organisation and is increasingly proposed as a solution to both the ills of medical education and new challenges such as clinical governance.<sup>14</sup>

There is no universal definition for problem based learning, and a “conceptual fog” prevails regarding both its philosophy and practice—the term is used, for example, to describe both an educational method and a curricular philosophy.<sup>15</sup> This has important implications for evaluation, research, and comparisons of programmes.<sup>16</sup> However, problem based learning is generally understood to mean an instructional strategy in which students identify issues raised by specific problems to help develop understanding about underlying concepts and principles. The focus is usually a written problem comprising “phenomena that need explanation.”<sup>17</sup> New knowledge and understanding arise through working on the problem rather than in the traditional approaches in which the new knowledge is a prerequisite for working on the problem. A better term for the approach might be “problem first learning.”<sup>15</sup>

Problem based learning is usually focused on small groups with a tutor and follows a particular sequence such as the Maastricht “seven jump”—named after a Dutch children's song (box 3). These steps enable learners to identify their needs in understanding a problem and, once these are identified, to pursue their goals—usually independently—and finally to join forces once more to synthesise their findings.<sup>18 19</sup>

**Development of problem based learning**

The application of problem based approaches in education is not new. In 1889 a method known as “multiple working hypotheses” was advocated.<sup>20</sup> Dewey, one of the educational theorists of the early part of this century, recommended that students should be

**Box 3—Maastricht “seven jump” sequence for problem based learning**

- 1 Clarify and agree working definitions and unclear terms and concepts
- 2 Define the problems; agree which phenomena need explanation
- 3 Analyse the problem (brainstorm)
- 4 Arrange possible explanations and working hypotheses
- 5 Generate and prioritise learning objectives
- 6 Research the learning objectives
- 7 Report back, synthesise explanations, and apply newly acquired information to the problem

**Box 4—Advantages of problem based learning**

- Promotes deep, rather than surface, learning
- Enhances and retains self directed skills
- Learning environment is more stimulating
- Promotes interaction between students and staff
- Promotes collaboration between disciplines—for example, basic and clinical scientists
- More enjoyable for students and teachers
- Promotes retention of knowledge
- Improves motivation

presented with real life problems and then helped to discover the information required to solve them. Later, other workers showed that giving students ready made solutions for problems was “manifestly ineffective” for learning.<sup>21</sup> In the late 1960s, McMaster medical school in Ontario pioneered the first completely problem based medical curriculum, with Maastricht following in 1974 as the first in Europe. Around 150 medical schools worldwide (some 10% of the total) have adopted problem based curriculums; in the United Kingdom, Manchester, Glasgow, and Liverpool have taken this route, with several other schools including St Bartholomew’s, St George’s, Birmingham, and Newcastle introducing elements of problem based learning.

Problem based learning can be seen as “a systematic attempt to apply findings of cognitive psychology to educational practice.”<sup>17</sup> Relevant areas include: activation of prior knowledge (a major determinant of what can be learnt); learning in context (enhancing transfer of knowledge); elaboration of knowledge (enhancing subsequent retrieval); and fostering of competence by an inquisitive style of learning.<sup>22</sup> Problem based learning fits with what is known about the development of clinical reasoning and the process by which so called “illness scripts”—cognitive structures describing the features of “prototypical” patients—are acquired.<sup>23</sup> There is no evidence, however, that generic problem solving skills are enhanced through problem based learning.<sup>24</sup>

Several authors have reviewed the evidence for and against problem based learning,<sup>25–28</sup> and in spite of semantic difficulties, different study designs, confounding variables, and different interpretations of the evidence, several benefits have been identified (box 4). Some of these benefits may be indiscernible from those related to other concurrent curricular innovations. Maudsley, however, considers problem based learning to have survived unprecedented scrutiny.<sup>15</sup> Several disadvantages have also been identified including the costs for starting up and maintenance,<sup>27</sup> excessive demands on staff time,<sup>29</sup> increased stress on both students and staff,<sup>27</sup> relative inefficiency,<sup>25</sup> reduced acquisition of knowledge of basic sciences,<sup>26</sup> and implementation difficulties when class sizes are large or where there is a broad lack of enthusiasm for the approach.<sup>25</sup> Finucane and colleagues provide a balanced consideration of the advantages and disadvantages of adopting a curriculum for problem based learning.<sup>28</sup> There is as yet no evidence that graduates of problem based programmes make better—or worse—doctors in the long term.

**Guided discovery learning and study guides**

In reviewing and revising their undergraduate curriculums, many medical schools with large class sizes have chosen to introduce revised teaching and learning strategies that are more learner centred but which attempt to combine the best of traditional modes with more innovative methods.

The better examples of this mixed approach, such as that adopted by Newcastle and Dundee,<sup>30</sup> may be described as a form of guided discovery learning. The key features are learning how to learn through the process of discovery and the exploration of knowledge, coupled with the responsibility of the learner to master the content needed for understanding (box 5). Usually within the structure of an integrated, system based curriculum design, the learning frame and desired learning outcomes for each theme are introduced using didactic plenary teaching methods, which are extended by self directed learning and reinforced through problem oriented, task based, work related experiences, and small group discussion. Relevance and motivational context is provided by ensuring that each theme focuses on real problems, and the overall learning process is facilitated through the use of study guides and logbooks.

In this context a study guide is an aid designed to assist students with their learning. The study guide is the main tool by which staff support self directed study—guiding the learners while at the same time ensuring active involvement in the management of their own learning.<sup>31</sup> A good study guide indicates what should be learned by specifying learning outcomes, helps students to set their own objectives and plan their learning, identifies appropriate learning resources and advises on their use, and provides opportunities for students to assess their own competence. Properly used, study guides improve communication and can provide guidance like a good tutor but without the need for excessive staff-student contact. Interactive electronic versions of study guides on the world wide web have also been developed, usually in the form of notes.<sup>32</sup> The internet enables both students and staff to access study guides, and as part of a wider learning environment, the study guides may be used to help students based at sites distant from the medical school.<sup>33</sup>

**Box 5—Key features of guided discovery learning**

- A context and frame for student learning through the provision of learning outcomes
- Learners have responsibility for exploration of content necessary for understanding through self directed learning
- Study guides are used to facilitate and guide self directed learning
- Understanding is reinforced through application in problem oriented, task based, and work related experiences

## The changing role of teachers

Learner centred approaches challenge the traditional view of the teacher as the person who determines what, when, and how learners will learn, with didactic teaching as the predominant method. Creating an environment in which students can learn effectively and efficiently becomes the new prerequisite, demanding not only that teachers are experts in their fields but also—and more importantly—that they understand how people learn.<sup>34</sup>

This has major implications in terms of staff development, with the recognition that changing a curriculum and keeping it going are unlikely to be effective if teachers are not able to take on new roles. Such development needs to take place at all levels from the institutional to the individual.<sup>35</sup> Barriers include the perennial problems of conflict with service provision and the “research first” culture that prevails in most medical schools, and the underresourcing of faculty development.

## Conclusion

It is for each medical school to determine its own educational aim, analyse the context in which it operates, identify the factors that constrain its operation, and choose the curricular model and teaching and learning methods that suit it best. Provided it is evidence based, diversity of approach is a good thing and to be encouraged. Whatever the detail, a strategy that promotes self directed learning is likely to be the most effective. There is still, however, a need for rigorous evaluation before one approach can be deemed to produce better doctors than another.<sup>36</sup>

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