

Notes for Primary Care Teachers

SELF-DIRECTED LEARNING: WHAT IT IS, AND HOW TO PROMOTE IT

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"The only man who is educated is the man who has learned how to learn..." CR Rogers, 1983

INTRODUCTION

General practitioners (GPs) should develop sound learning habits to ensure successful independent, life-long learning throughout their professional life. However, GPs with their busy schedules usually face numerous daily demands leaving considerably little time for effective self-study.¹ Trainees need to realise that learning is not merely to pass examinations but to continually keep up-to-date with the ever-increasing knowledge and developments in medicine to remain a competent medical practitioner.

Think of self-directed learning (SDL) methods that you may have used successfully and share these with your students. As their teacher or mentor you can certainly guide students to learn in a better way. Picking up these skills early, for example during the vocational or masters training period, will be advantageous to the learner. The following sections suggest some strategies to encourage and hone SDL skills in learners under your supervision.

WHAT IS SDL?

As defined by Knowles, SDL is a process in which students take the initiative to recognise their learning needs, put together learning goals, identify human and material resources for learning, choose and implement appropriate learning strategies and evaluate learning outcomes.^{1, 2} During undergraduate years, the course is more structured and medical students are usually given direct guidance by their teachers. The learning environment in SDL is such that students are given a great deal of responsibility for learning. Therefore, as the student matures, e.g. during vocational training as well as while undertaking Continuing Professional Development (CPD), the reliance on SDL will increase.

At each phase of study, the ability to accurately identify learning needs is a challenge. If the learner assesses his or her needs erroneously; poorly directed SDL may result. As a teacher we must be aware that a major limitation of SDL is that some

learners may continue to learn more of what they are already familiar with whilst ignoring areas in which they are uninformed or uncomfortable.³

Thus, appropriate and timely guidance by the teacher is a key element for success. Students could also be encouraged to undertake regular self-assessment to determine their learning needs, e.g. appropriate tests. Box 1 outlines the six key principles of SDL.⁴

Box 1: Key Principles of Self-Directed Learning (SDL)

Key Principles of SDL

1. Students (trainees) learn on their own.
2. Students have a measure of control of their own learning. They may choose:
 - o What to learn
 - o How to learn
 - o When to learn
 - o Where to learnThey are responsible for:
 - o determining personal learning needs
 - o deciding the context for learning
 - o deciding the time and pace for learning
 - o identifying the resources
3. The specific needs of individual students must be recognised and appropriately responded to.
4. Students may be encouraged to develop their own personal learning plans.
5. The students' learning must be supported by learning resources.
6. The role of the teacher changes from a transmitter of information (teacher/lecturer) to a manager of the learning process.

LEARNING ON THEIR OWN

Students will spend considerable time learning on their own. Determining the way that suits them best will be invaluable. Other than self-assessment of learning needs mentioned

above, self-evaluation of a student's learning styles will be useful for SDL. Learning style is defined as how one acquires and processes information. Research has shown that each person learns in a particular way.^{4,5} There are self-assessment tools which can help learners determine their personal learning style.⁶

Therefore, student should decide the 'what', 'where', 'when', 'for how long' and 'how' for individual study and accordingly plan their study time. It would be useful to develop personal learning plans to aid this process.⁷

1. What?

Firstly, the student must decide what he or she wants to learn. If it is knowledge, then this is usually acquired through listening to lectures or reading a relevant book or journal. Nevertheless; interactive modes of learning promote better retention of knowledge compared with passive reading or listening to lectures.⁴ Behavioural aspects like attitude however are best adopted from role-modelling.

2. Where?

Encourage the student to find the place where it feels most comfortable to study. It is best to have an area specifically for study. This area should have comfortable furniture, lighting and most importantly minimal distractions. As we age, the ability to concentrate can be enhanced by adopting a more conducive learning environment.⁸

3. When?

Different individuals study best at different times of the day. It is important to find the best time to suit the student's needs, as well as making sure the student puts aside enough time for family and self. When the day-to-day family obligations are in order, the student will then have peace of mind. This will enable the student to concentrate on his or her work. Students must also put aside time for themselves; to have adequate sleep, exercise and to eat sensibly.

4. For how long?

It is useful to plan a time table; listing out all that the student needs to learn for a week or a fortnight. The student may plan to study for a one- or two-hour period at a time as well as making sure that they have short breaks in between when the period is long.

5. How?

Well-planned learning is an active process. The student must seek and utilise methods that assist in learning effectively. Some learn best by reading while others may do so by watching audio-visual material. A significant proportion do learn by actively doing a

task and then interacting and discussing with a colleague at the workplace to better understand the subject matter. Methods that promote deep learning where the student undertakes an active search to better understand what is being learned are most useful. Finally, encourage the student to stick to his or her plan!

LEARNING WITH UNDERSTANDING

Learning comprises of both what is learned as well as how it is learned. It is important to note that 'how' one learns essentially determines whether or not 'what' is learned will become part of a learner's collection of knowledge ('long-term memory') or is discarded soon after its use ('short-term memory').²

In the practice of medicine, some knowledge will need to be stored as long-term memory whereas information that is easily accessible need not be stored. However, students must learn appropriate information handling skills to access this at the point of care.

Let us take as an example of a patient in general practice. Azima, aged 22 years, attends the clinic seeking treatment for a prolonged fever of a two-week duration. For a successful consultation, the attending GP will need to derive the possible diagnosis and differential diagnoses as well as the required relevant investigations. This usually is from long-term memory. However once the diagnosis is confirmed, the GP may refer to a current drug formulary to verify the most effective drug of choice for Azima. This may be a drug that is used infrequently (short-term memory).

Sometimes the GP may have inadequate knowledge of an essential subject matter. For example, as in Azima's case, the GP may have forgotten about less common infectious diseases which cause prolonged fevers. The GP should then take the opportunity to read on this topic from a relevant textbook or a review article as soon as possible. SDL is more effective when linked to a recently encountered patient problem.^{5,17} Therefore, learning with understanding, i.e. deep learning, aids long-term retention of knowledge.

READING THE SELECTED SUBJECT EFFECTIVELY

The collection of medical information multiplies in large quantities each year. Learning to be selective is an essential skill. Students should have at least one current core text book as a reference for each of the major subjects that they are studying. As a general guide, students must refer to the course guidebook of the course for which they have signed up, e.g. dermatology in family practice, primary care orthopaedics,

vocational training programmes, etc. Ideally, students should own a personal copy of relevant core texts.

Next, the student must be clear of the purpose of study so as to read effectively. The student should ask "Why am I reading this?" Is it for general interest or is the student in pursuit of specific information? If the student is aiming to do some essential reading, the following frequently-suggested SQR4 approach may be useful (Box 2).⁵

Box 2: The SQR4 Approach

SQR4 Approach

1. SCAN - for an overview
2. QUESTION - what do you want from your reading?
3. READ - an active process, looking for key material
4. RECALL - periodically consider what you have covered
5. REVIEW - at the end, put it all together
6. RELATE - tie in with other topics (the most important step)

THE SQR4 APPROACH

Take as an example a patient Linda, aged 43-years-old, in a general practice clinic who seeks advice about her risk of developing breast cancer. Linda's mother was diagnosed with breast cancer and died from metastatic disease at the age of 56.

The student decides to read up on the genetics of breast cancer and factors that may affect the risk of developing this condition and choose to read a British Medical Journal review article titled 'ABC of breast diseases: Breast cancer – epidemiology, risk factors, and genetics' by McPherson K *et al.*⁹

The student can read and apply the SQR4 approach as follows:

1. Scan through the article to see what the sub-headings are.
2. Look for the summary and read it through, identifying the main points and discussions that have been covered.
3. Ask "What do I want to get from this reading?"
4. Read the introductory paragraphs. These would 'set the scene'.
5. Then, read the sections and sub-sections, actively identifying the main ideas in each.
6. Link this to the patient i.e. Linda in this case. Ensure understanding regarding how the patient's issues are related to the facts or thoughts in the chapter.
7. Summarise periodically. It is important to pause and list the main ideas in the section being read and check that the important points have not been missed out and that the ideas have been understood. Encourage note-making along the way.

8. Then review the whole topic when finished by scanning through the notes.
9. Relate what has been read to other areas of knowledge. For example, prior knowledge of genetic predisposition for instance in an earlier patient seen with a family history of colonic carcinoma will reinforce the repertoire of knowledge in this area of medical genetics.

In the above approach, there is an emphasis on relating the material in each section to other material. Research has shown that new material is more readily learned when this can be slotted into a framework of previously-acquired knowledge.⁴ So as one learns, one must relate the new information to earlier-learned facts (review point 9 above). When this is done, it reinforces the newly gained knowledge as this is built on what has already been learned.

Should students encounter a similar situation in the future, they will readily recall what they have learned – the student has now learned to integrate their learning. Consequently, learning during medical practice will be most effective if their reading is done around patients that have been seen day-to-day.

The use of personal learning plans and portfolio-based learning are methods that have been recommended to develop effective learning. These could aid deep-learning. Portfolio-based learning and assessment has already been addressed in this series. Another effective study technique used to improve factual recall of written material is mind-mapping. Some of these methods are described below.

PERSONAL LEARNING PLANS

A Personal Learning Plan (PLP) or learning contract is a description of what a student wants to learn about and how they will go about it. It encourages the student to identify what needs to be learned, why they need to learn it and how they are going to learn it. The PLP also identifies how they will know when they have learned it, the time frame they are going to learn it as well as identify how their intentions link to past and future learning.⁷

Basically, the PLP assists the student to document and put into motion, in a structured way, their plan to learn when they encounter an event or incident that made them think about what needs to be learned. An important aspect of a PLP is that the student is in control. The student identifies something that needs to be learned, then thinks how to do it and proceeds to do it. The student should then reflect on whether the process was useful and resulted in any change. To enhance this process, students should share their PLPs with their mentor (trainer) who can provide support, guidance and challenges when necessary. In Appendix 1, an example of a PLP template

adapted from the Association for Medical Education in Europe (AMEE) Guide is given.

THE MIND-MAP APPROACH

This technique could be effective for study when used to improve factual recall of written material. This was made popular by Tony Buzan who developed 'mind-mapping' as an alternative to traditional note taking, which is usually time-consuming to create and review. He recommended mind-mapping as an efficient way to take notes from lectures or books. Mind-maps can be drawn by hand, either as rough notes, for example, during a lecture or clinical meeting, or can be more complex. Mind-maps can also be produced using software packages. You can learn how to do a mind-map from various sources.^{10, 11}

In recent years, educational material to improve memory for medical information in the form of mind-mapping has surfaced.¹² With this technique, information from a variety of sources is converted into a visual illustration of the important key words associated with a study topic. Mind-mapping (or concept-mapping) involves writing down a central idea and thinking up new and related ideas which radiate out from the centre. The student could focus on key ideas written down in their own words, and then look at other levels of ideas that can branch out. As they create connections between the ideas, they are mapping knowledge in a manner which will help them understand and remember new information. Thus, mind-maps could provide an alternative, effective study technique.^{12, 13}

SUPPORTING THE LEARNER: LEARNING RESOURCES

In order to undertake effective independent study, it is important to encourage a learning environment that is conducive and possesses relevant learning resources. It is said that learning which is reinforced by various stimuli is likely to be retained longer.⁴ For example, to learn the current therapeutics of hypertension, individual learners may learn best in different ways. Some may prefer to learn from a current therapeutic textbook whereas others may prefer case discussions with a senior doctor or to use multimedia material, e.g. an educational DVD or internet websites with interactive case discussions, e.g. *gplearning*.¹⁴

Students can also be supported in their learning with study guides (SGs). SGs could be paper-based or electronic material which is carefully designed to include the learning objectives and other relevant activities to motivate the learner in a particular area of study. The SGs could also list the relevant core text and other recommended reading as well as useful websites. Refer to the AMEE guide on this topic to obtain further information on SGs and their preparation and use.¹⁵

An essential skill for life-long continuing education in this present era of information explosion is the ability to seek, retrieve and store the necessary information. Learners who have not have learned this skill adequately should attain guidance and training in this area. One way is to visit the nearest medical library to seek guidance from the librarian on how best to locate information from the various sources including web-based resources. Although the use of electronic media, e.g. computers and the internet, provide a simpler and inexpensive method for learning than conventional libraries, there is evidence that on-site librarians are still needed to support better clinical use of these resources.¹⁶

SUPPORTING THE LEARNER: ROLE OF THE TEACHER

For an adult learner, the role of a teacher is to be a facilitator or manager of the learning process and not merely a transmitter of information.^{4,5} As teachers, we can help students identify the way they learn best. Most importantly, students should be encouraged to reflect on their learning style and ask "Is the method employed effective in gaining the relevant knowledge or skill?" Students could adopt useful strategies to aid the learning process. Most students, depending on the level of maturity, are usually not equipped to be entirely 'self-directed'. As teachers, we need to provide the necessary guidance and motivation.

Learners should not be left completely on their own. Regular interactions between the learner and teacher either face-to-face, via telephone or by e-mail could enhance the learning process. When done face-to-face, there may be opportunity to directly observe clinical interactions of the learner (preceptor), e.g. to see if the patients are being offered current and best-evidence treatment options. Direct observation and feedback though ideal is usually not feasible due to time pressures.

Alternatively, the learner could have on a regular basis either lunch time or after-clinic clinical meetings on a topic of interest with a mentor or senior work colleague. Medical audits or patient record reviews by a senior doctor can provide similar feedback to the learner. Patient record review could involve lessons that one can learn from a particular patient. A significant event could be either 'good' or 'bad'. Examples of such events could include an acute asthma attack in which a patient had to be admitted to hospital, a request for termination of pregnancy or a patient being rude to a nurse. Learning in the workplace emphasises problem-solving and learning skills, such as how to find relevant answers fast and not just learning the facts. Lessons are learned faster and recalled more reliably when they originate in everyday experience. Teachers could encourage regular learning in the clinical workplace as this can be powerful stimuli for learning.^{18, 19}

RESPONDING TO THE LEARNER'S NEEDS

Another key principle of SDL is that the specific needs of individual trainees must be recognised and appropriately responded to. As a teacher you will realise that each of your trainees may have varying learning needs. The challenge is to identify and appropriately respond to their diverse requirements. For example, if one of your trainees is a fast learner it is important to recognise this and provide adequate stimuli to keep this learner's enthusiasm. On the other hand, a slower learner would need the necessary attention to raise the trainee's capability to acceptable standards.

CONCLUSION

In conclusion, teachers could provide regular motivation and guidance to the learner to encourage effective learning. Putting together what is required for study and organising oneself is the first step in studying in a smarter way. Students need to be guided to be organised, well-prepared and to be active learners who constantly review new information as well as reinforce previously learned information.

Furthermore, as learning styles vary among students, it is equally important to encourage students to identify the best method for a particular area of study based on the student's learning style, type of learning objective as well as time available for study.

Teachers must also be aware that students may fail to identify true deficits in their knowledge or skill. The student may continue to identify and learn what they are already familiar with or what they view as interesting while disregarding new areas that they may view as complex. However, when a student fails to recognise his or her exact needs, the teacher must step in and guide him or her accordingly. Thus, the role of a teacher is mainly that of a facilitator i.e. to guide rather than direct learning.

"Medical education is not completed at medical school, it has only begun." William H. Welsh, 1850-1934

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Appendix 1: PLP template adapted from AMEE⁷

MY PERSONAL LEARNING PLAN					
Learner name:					
Mentor:					
Date agreed:					
Date for review:					
What incident / event made you think about what you need to learn?	Learning Objectives (what you intend to learn)	Strategies and resources (what you intend to do & what facilities you need to achieve objectives)	What is to be reviewed/ assessed (the evidence you will produce to show that you have met your objectives)	Criteria for review / assessment (what will demonstrate that you have been successful)	Timescale (when you intend to have completed this part of your learning)
An example: Instituting insulin therapy in a Type 2 DM patient	How to institute insulin therapy	<ul style="list-style-type: none"> – read up on the theory – discuss with supervisor or mentor – observe others 	record of having tried and successfully achieved the task assigned by clinical supervisor	Safe and improved approach to insulin therapy	Two weeks
Signature of learner:					
Signature of mentor:					