

Adult learning theories and medical education: a review

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Abstract

Adult learning theories describe ways in which adults assimilate knowledge, skills and attitudes. One popular theory is andragogy. This is analysed in detail in this review. The importance of extrinsic motivation and reflective practice in adult learning is highlighted, particularly since andragogy fails to address adequately these issues. Transformative Learning is put forward as an alternative concept. Using the three recognised domains of knowledge, skills and attitudes, ways of applying these theoretical concepts in medical education are subsequently discussed.

Introduction

In the past, there has been an assumption that if a person knows very well the subject, then, he will be able to teach it. However the complexity involved in practising medicine must be tackled with appropriate educational strategies in the training and education of undergraduate and postgraduate students. In fact, training teachers in educational techniques translates in better student learning outcomes.¹

The aim of this review is to present and analyse andragogy in the broader context of adult learning theories. Ways on how to apply educational theories will be put forward, with the ultimate aim being to foster medical competence.

Adult learning theories

Given that in the medical context most education involves adults, it is logical to focus on adult learning theories. There are many adult learning theories, which can be grouped into five main classes. These include Instrumental learning, self-directed learning, experiential learning, perspective transformation and situated cognition.² Of these, self-directed learning particularly focuses on the individual learner as primary focus. Prominent amongst these self-directed theories is andragogy.

The term andragogy (*andra* – meaning “man”; *agogos* – meaning “learning”) was first used by Alexander Kapp in 1833 to describe the educational theory of the Greek philosopher Plato. He used it to refer to the normal process by which adults engage in continuing education. In the 20th century, various respected intellectuals, such as John Dewey, Eduard Lindeman, and Martha Anderson pursued theories of andragogy, but were largely ignored in the US. Things changes in the 1980's, with the work of Malcolm Knowles who championed this theory and further elaborated the concept.³

Andragogy assumes that adults:

- are independent and self directing,
- have (various degrees of) experience
- integrate learning to the demand of their everyday life
- are more interested in immediate problem centred approaches and
- are motivated more by internal than external drives.

Keywords

Adult learning, medical education, reflective practice

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Another characteristic deemed to be relevant to adult learning environments, is the importance of mutual respect between teacher and learner and also amongst the learners themselves. Respect is important since it is a catalyst for a safe educational environment.⁴

Unfortunately, reflection is left out of Knowles' concept of adult learning, despite being an important component of adult learning skills.^{5,6} In fact, reflection is the second of the four steps in Kolb's Learning Cycle.⁷ In addition, the importance of reflection can be appreciated even more when one considers it to be an important difference between adult learning (andragogy) and child learning (pedagogy) theories. Finally, reflection can be seen to enhance adult learning by increasing motivation to learn.⁸

Motivation is another important pillar on which adult learning is built. There are two major groups of theories describing motivation:

- content theories: these describe what motivates people, and
- process theories: these describe how people are motivated.⁹

One of the most popular of the content theories is Maslow's Hierarchy of Needs.¹⁰ The hierarchy moves from the most basic needs, such as physical needs and security culminating in self-realization (Figure 1). The importance of a safe educational environment cannot be overstated in the successful progression of the learner through the hierarchy of needs as described by Maslow. Thus the importance of respect as stated previously.

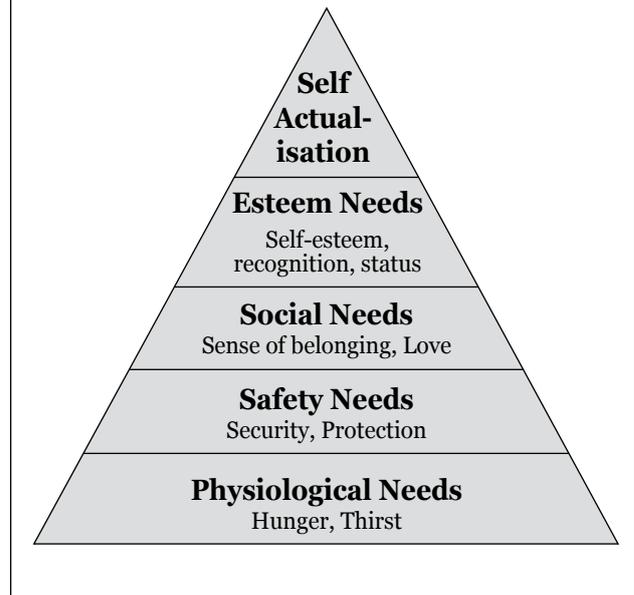
However, Maslow's model may be seen to be too rigid. In addition, an individual may be satisfied and unsatisfied with various needs simultaneously throughout his learning trajectory. It can thus be seen to be inadequate. A more appealing content theory is the one put forward by Clayton Alderfer, who describes and summarises motivation in three needs, ERG:⁹

- **Existence** – this is more or less equivalent to Maslow's safety and physical well being steps
- **Relatedness** – stresses the importance of interpersonal and social relationships
- **Growth** – intrinsic individual desire for personal growth

Process theories of motivation, on the other hand, are based on the idea that certain behaviours are produced by particular stimuli. One such theory is the Expectancy Theory which states that motivation depends on two perceptions:¹¹

1. an expectation that an outcome will bring the desired rewards
2. the required performance is within the capability of the person.

Figure 1: Maslow's Hierarchy of Needs which drive motivation



In andragogy, Knowles states that adult learners are self (intrinsically) motivated.³ He fails to mention extrinsic motivation and especially, the role of the teacher as major source of motivation. In fact, as Peyton⁹ points out, most adult learners require the motivation provided by teachers for effective learning to take place.

Not all adult learners are equally intrinsically motivated, and this further highlights the inadequacy of andragogy with respect to motivation. In fact, there necessarily arises the need of a mix of learning strategies, ranging from teacher-directed to student-directed learning.¹³ This implies that there needs to be a "match" (Figure 2) between the learner and the teaching styles used.¹⁴

But how does one strike a "match" between learner stage and teacher style?

Certainly, this involves an amount of flexibility on the part of the teacher. The most important step to clinch such dynamic relationship is to carry out a needs-assessment of the student/trainees involved. Without such needs assessment, teaching would be tantamount to treatment without a diagnosis. For example, whereas in the first clinical attachments, students would be dependent on the teacher to show them how to take a history, during the subsequent years, the learning strategies should deal with examination skills, going on further along the months to discussing the differential diagnosis and treatment of the patient's symptoms. This shift in teaching stages will hopefully be matched by the progression of the learning stages

Figure 2: Matching learner stages to style¹⁴

		Teacher Styles			
		Authority, expert	Salesperson, motivator	Facilitator	Delegator
Learner Stages	Dependent Learner	Match			
	Interested Learner		Match		
	Involved Learner			Match	
	Self-directed Learner				Match

coupled with the learner getting more involved (motivated) in the process. This dynamic process can be successfully achieved with a variety of tools:

- Reflective diary/practice – this will stimulate reflection and facilitate in-depth search on certain topics in addition to allowing for personal development.
- The relevance of what is being taught to medical practice should always act as a background for any discussion on topics.
- Use of the trainees’ experiences to discuss issues in practice, especially at postgraduate level.
- Small group work on abstract or “difficult” concepts e.g. end of life.
- Problem based learning.
- Open discussions on “hot topics” such as medico-legal litigation.

Given that andragogy fails to adequately address reflection and motivation, Mezirow’s concept of Transformative Learning seems more appropriate.¹² Crucial to this theory are the structures and mechanisms through which adults assimilate and understand their experiences. Transformative learning aims to effect change in established reference points used by the adult learner. These so called *frames of reference* are the meaning which people give to experiences and the structures used to arrive to such meaning. It is thus clear that these frames of reference are a reflection of the genetic make-up and cultural assimilation of the particular adult. These frames of reference can be transformed through a variety of ways, but primarily can be changed by critically reflecting on the assumptions which make up each frame of reference.

In line with the motivating role of the teacher in adult learning, Transformative Learning stresses the importance

of the teacher in facilitating learners to question and reflect on their own and others’ assumptions.¹² Methods that may be particularly useful in this situation include critical incident analysis, small group work to formulate ideas on particular topics and reflective practice.

Transformative learning is still in its development, and certainly there is the need of more research along this line.¹⁵ It is very similar to and indeed complements the idea of The Inner Apprentice.¹⁶ This concept was put forward by Neighbour in 1992, to describe the learning process of trainees. Neighbour put forward this concept to highlight what he called The Inner Apprentice i.e. the unconscious learning mechanism that is intrinsically self-educating, provided the right information is provided in the right place and at the right time. Given such favourable learning climate, the inner apprentice (trainee) acquires knowledge (learns) by moving from cognitive dissonance to cognitive resonance through stages of “kairos.” Kairos in Greek means the right time of action, and by analogy, during points of “kairos” the trainee can most clearly recognise the nub of the issue and is most receptive to mutative information. This mutative information eventually leads to changes in the *frames of reference* to achieve cognitive resonance.

Going through the theories of adult learning, one runs the risk of losing track of what they stand for – to enhance adult learning and facilitate effective teaching. In other words, in the medical field, this means the achievement of medical competence, whatever speciality, by the trainee. Indeed, achieving medical competence should be (and usually is) one of the ultimate motivations of any medical educational setup. This statement is many times taken for granted, but medical education, may at times actually lead to incompetence.¹⁷ Medical competence can be defined as:

“The habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values and reflection in daily practice for the benefit of the individual and the community being served.”¹⁸

Medical education, including its theoretical basis, should effectively address all of these issues to produce competent trainees. This implies that there needs to be a sound and effective application in practice of theoretical concepts, using the fact that medical education is based on three interrelated domains, which are knowledge, skills and attitudes.¹⁹ Knowledge can be defined as:

“...a background of facts and interactions between facts that should lead to an understanding of the material being learned”²⁰

Lack of knowledge is occasionally difficult to identify. An interesting way to picture knowledge (and the lack of it) in learners is by the using the concept of JoHari Windows (JW) put forward by Joseph Luft and Harry Ingham (hence: Joseph & Harry = JoHari)²¹. They developed this model in the 1950’s while working on group dynamics. The JW can help to illustrate and improve the self-awareness between individuals and teams. It is sometimes called a disclosure/feedback model of self awareness. The applications of this model are many, and one particularly good use of it is to map out the trainee’s knowledge, which is

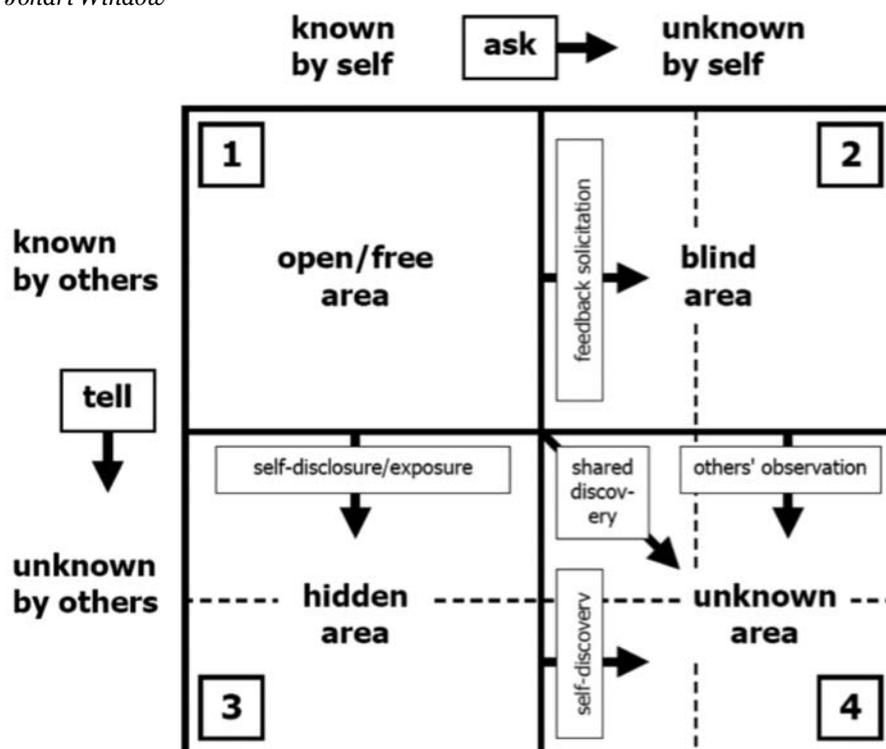
divided into four distinct areas. These divisions allows for easier understanding and management of knowledge (Figure 3).

Through this categorisation, various aspects of knowledge can be addressed accordingly, though area 4 (The Unknown area) is not amenable to modification. Thus area 2, is called the Blind Spot since it refers to knowledge not known to the trainee. This can be addressed through didactic-interactive type lecturing, where new information is provided. Area 3 is called the Facade Area, and refers to what the person knows about himself which the rest of the people do not know. This can be tackled using discussions and small group work. Teaching of both areas 2 and 3, and possibly area 4 is augmented with reflective practice.

Skills are very much the panacea of medical institutions. Until recently the adage used to be “see one, do one, teach one.” This method fosters a sense of competition and pride in the medical profession but at the same time creates undue tension in the learner and also may inhibit exploration of various aspects of the studied skill for example when things go wrongs or possible complications which arise during or after the particular procedure. In addition, certain skills such as communication skills do not lend themselves readily to this format.

A practical example in the case of surgery would be teaching a trainee how to remove a sebaceous cyst. The

Figure 3: The Johari Window²¹



practical skill involves setting the scene correctly, using a sterile environment, preparing the skin, using the necessary instruments appropriately, removing the cyst with the capsule, suturing the wound ending by submitting the sample for histological assessment. However, in addition, to this, it is important to discuss the complications and their management, besides stressing the importance of providing proper information to enable the patient to make an informed consent.

George & Doto offer an interesting skill-teaching framework:²²

1. **Overview:** introduction to why the skill is needed and its relevance in the area of practice of the learner. Basic concepts on the skill.
2. **Demonstration without comment:** allows the learner to observe a whole picture of required skill.
3. **Demonstration with comment:** allows fragmentation of the skill into more manageable portions.
4. **Verbalisation:** learner talks through the skill.
5. **Practice:** the learner executes the skill.

In addition, it is felt that the final stage can be further supplemented by positive feedback and encouragement from the trainer.

George & Doto go further and describe reasons which may prevent the acquisition of the required skill such as inadequate demonstration/description, imprinting of previous wrong exposures and improper correction. These have to be kept in mind when teaching a skill.

The last domain in medical education is attitudes. In guidelines of desired medical conduct the attitudes of the medical professional are highly regarded.²³ However, it is generally felt that in medical curricula this aspect is not given its due recognition. Through their own nature, attitudes are difficult to describe, quantify and address. Passing on desirable attitudes seems even more difficult.

Attitudes can be defined as "...a learned predisposition to respond in a consistently favourable or unfavourable manner with respect to a given object."¹⁹

There are various ways in which attitudes can be addressed. In the undergraduate scenario, certain specialties, more than others, are useful in passing on particular attitudes. General practice and palliative care, for example, through their philosophies of holistic assessment and "total care" respectively, are suitable to pass on attitudes related to managing the patient and family.^{24,25}

In fact, "incorporating palliative care into medical training not only improves the quality of palliative care, but also contributes to the moral quality of the doctors being trained."¹⁹

On the other hand, surgical based specialties, will be more prone to pass on practical and hands on attitudes. These two examples highlight the importance of exposing undergraduates to a mix of specialties, away from the traditional setup, to aid the development of appropriate attitudes.

Another relevant way of passing on appropriate attitudes is teaching in the clinical environment (also known as On the Job Teaching - OTJT). Together with providing an opportunity to pass on skills and even knowledge, OTJT offers an opportunity to discuss, albeit briefly, various issues which may crop up from different clinical scenarios.²⁶ Such issues may include ethical questions and dealing with one's own feelings when faced with a sick patient. Certainly, a traditional lecture will not be able to flag up these attitudinal challenges.

For a successful OTJT experience, planning and commitment on behalf of the teacher is paramount. In addition, time pressures will certainly make things more difficult for teaching, especially during a busy ward round or outpatient session. However, the trainees will have the opportunity of seeing the teacher interact with the patient, and also with adequate planning there can be room for small discussions. There are various methodologies of carrying out OTJT which have been highlighted in a recent systematic review and are summarised in Table 1.²⁷

Feedback, in such situations and indeed in all situations should be given along Pendleton's' rules, thereby not undermining the standing of the student or trainee.²⁸ By being allowed time and space to explore one's own thoughts, the frames of reference (as outlined in Transformative Learning) related to attitudes can be changed and modelled accordingly.

Conclusion

Addressing all of the above issues in a systematic way can be an arduous task, even for the most dedicated of trainers! However, the educational cycle is a useful concept for planning teaching activities. It consists of four steps:⁷

1. Assessing the needs of the learner
2. Setting educational objectives
3. Choosing and using a variety of methods
4. Assessing that learning occurred.

In conclusion, andragogy is a popular theory used in medical educational. However, adult learning goes beyond that described by andragogy. Indeed reflection and (extrinsic) motivation are insufficiently addressed by this concept. Transformative Learning, though in its infant stages, seems to be particularly appealing since reflection is given prominence. There needs to be more awareness of the role of the teacher in acting as a catalyst for motivation. In addition, less traditional methods of teaching, including small group work and reflective practice should be

Table 1: Types of ambulatory teaching methods

1. Orienting learner	Assess learner before clinical encounters, orient to the clinical site and preceptor style and expectations
2. Prioritising learning needs	Before clerkship/clinic session, assess, prioritise, and tailor learner's experience.
3. Problem-orientated learning	Focus on a theme for clinic day to control variability inherent in office-based practice (e.g., well-child visits).
4. Priming	Teacher-directed brief (1–2 minutes) orientation of learner to the patient and task(s) immediately before entering the patient's room.
5. Pattern recognition	The "Aunt Minnie" method emphasising learner report of chief complaint and presumptive diagnosis rather than detailed case presentation.
6. Teaching in the patient's presence	Learners present findings in front of patient with preceptor "teaching" in response to this presentation
7. Limiting teaching points	Focus on 1 to 2 key concepts/principles per teaching interaction.
8. Reflective modeling	Learner observes preceptor actions complimented by preceptor explanations.
9. Questioning	Allows preceptor to assess learner to guide subsequent teaching of higher/lower-order concepts.
10. Feedback	Ongoing provision of information designed to guide learners' performance beginning with concrete experience, learner self-assessment, abstraction of experience to general concept, then testing validity of concept (Kolb).
11. Teacher/learner reflection	Connects new elements to existing knowledge for both learner and teacher

encouraged. Any learning activity, should ideally address the knowledge, skills and attitudes necessary to become competent in what is being taught, or at least act as a building block towards achieving such aim. The educational cycle is simple and useful to plan activities.

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