Brief Communication

Learning methods and its application in medical education

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Abstract:

This short review summarises a range of learning theories that can be applied in medical educational contexts. Teaching and learning activities can be designed and implemented to take principles of learning into account. Also, it is interesting to think about individual differences among learners and to work towards including activities that have variety and interest for all the learners in educational programs.

Key Words*: Learning methods, Medical education*

Introduction

Varieties of theories of learning are available for trainers to use in medical education, it is very important to identify the principles of learning and understand how individual differences affect the learning process. It is interesting to think about your own particular way of learning and to recognise that everyone does not learn the way you do.

Burns et al [(1)], defined learning as a relatively permanent change in behaviour with behaviour including both observable activity and internal processes such as thinking, attitudes and emotions. It is obviously true that Burns included motivation in this definition of learning. Burns considered that learning might not manifest itself in observable behaviour until some time after the educational program has taken place.

Facilitation theory

Also known as the humanist approach, the facilitative learning theories were developed by Rogers [(2)]. The basic idea of this theory is that learning will occur by the trainer acting as a facilitator, that is by establishing an atmosphere in which learners and trainees feel comfortable to consider new ideas and are not threatened by external factors [(2)].

This theory has identified that human beings have a natural eagerness and willingness to learn, this is clearly demonstrated by children learning as they grow up from their parents, also there is always resistance to the change, and the difficulties of giving up what is currently held to be true, the most significant learning involves changing one's concept of one self.

Facilitative educators are less protective of their constructs and beliefs than other teachers, as they are able to listen to learners, especially to their feelings, and inclined to pay as much attention to their relationship with learners as to the content of the course, they also accept feedback, both positive and negative and to use it as constructive insight into themselves and their behaviour.

Facilitative learners are encouraged to take responsibility for their own learning, they provide much of the input for the learning which occurs through their insights and experiences, they are also encouraged to consider that the most valuable

evaluation is self-evaluation and that learning needs to focus on factors that contribute to solving significant problems or achieving significant results.

This theory is particularly useful in medical education and applied science training. Counselling of patients with unusual diagnoses, communicating with parents of severely affected children, managing patients with cancer, are all good examples where facilitative learning can be applied.

Cognitive learning theory:

This theory defines learning as a process of relating new information to previously learned facts, and that some learning processes may be unique to human beings, who are actively involved in the learning process. According to Burns et al [3], this theory focuses on the importance of experience, meaning, problem-solving and the development of insights. Cognitivism focuses on an unobservable change in mental knowledge.

The theory assumes that objective, systematic observations of people's behaviours should be further investigated; however, interactions of unobservable mental processes can often be drawn from such behaviours. It’s well known that new information is most easily acquired when people can associate it with things they have already learned, and that generally people control their own learning, and as people get older they tend o learn more complex ideas.

Cognitivists also believe in reinforcement, but on a different level. They reinforce the learner through a process of retrieving existing knowledge and presentation of new information. They assess the learner's retention of the new information and provide feedback for effective organization of the information. Throughout the learning process, the instruction is motivated through a kind of mental stimulation, not behaviour modification [4, 5].

In medical education this theory certainly plays a major role in many aspects. Good examples include intraoperative learning as junior doctors who are learning caesarean sections tends to gain more surgical skills whenever they repeat the procedure. Also as medical educators, we quiet often recall the physiology of a certain organ before teaching our juniors the pathology, and we also use the same mechanism to teach investigations and treatment.

Behavioural Learning Theory

Learning according to the behaviourist theory is an observable change in behaviour; it applies equally to different behaviours and to different species of animals, where learning processes can be studied most objectively when the focus of study is on stimuli and responses, and on the relationship between learning and environmental events. Students should be active respondents; people are most likely to learn when they actually have a chance to behave. Also, student learning must be evaluated; only measurable behaviour changes can confirm that learning has taken place. Drill and practice are form of this theory and are widely used in medical and clinical learning; repetition of stimulus-response steps strengthens those procedures. One way to break a stimulus-response habit is to continue to present the stimulus until the individual is too tired to respond in the habitual way i.e. the exhaustion method [6].

Social learning theory

Social learning focuses on the learning that occurs within a social context. It considers how people learn from one another, encompassing such concepts as observational learning, imitation, and modelling. Although many species of animals can probably learn by imitation, social learning theory deals primarily with human learning. The theory also realizes that learning can occur without a change in behaviour. Teachers and parents must model appropriate behaviours and take care that

they don't model inappropriate ones. In medical education trainers should expose students to a variety of models, and medical students must believe that they are capable of accomplishing their tasks. Also teachers should help students set realistic expectations for their academic accomplishments [4].

Reinforcement theory

The learner will repeat the desired behaviour if positive reinforcement (a pleasant consequence) follows the behaviour. Positive reinforcement, or 'rewards' can include verbal reinforcement such as (perfect, you are a star, well done, etc.) through to more tangible rewards such as a certificate at the end of the course or promotion to a higher level in the hospital.

Negative reinforcement also strengthens behaviour and refers to a situation when a negative condition is stopped or avoided as a consequence of the behaviour. Punishment, on the other hand, weakens behaviour because a negative condition is introduced or experienced as a consequence of the behaviour and teaches the individual not to repeat the behaviour which was negatively reinforced [3].

Competency-Based Training which has been adopted by some of the United Kingdom colleges including the Royal College of Obstetricians and Gynaecologists (RCOG) is based on this theory. This method proved to be useful in learning repetitive tasks like work skills that require a great deal of practice.

Adult Learning

Adults have special needs and requirements as learners. Despite the apparent truth, adult learning is a relatively new area of study. The field of adult learning was pioneered by Malcolm Knowles. He identified the following characteristics of adult learners:

Autonomous and self-direction: Adults need to be free to direct themselves. Teachers must actively involve adult participants in the learning process and serve as facilitators for them. Specifically, they must get participants' perspectives about what topics to cover and let them work on projects that reflect their interests [7]. They should allow the participants to assume responsibility for presentations and group leadership. They have to be sure to act as facilitators, guiding participants to their own knowledge rather than supplying them with facts. Finally, they must show participants how the class will help them reach their goals.

Life experiences and knowledge: Adults have accumulated a foundation of life experiences and knowledge that may include work-related experience, family responsibilities, and previous education [8]. They need to connect learning to this knowledge/experience base. To help them do so, they should draw out participants' experience and knowledge which is relevant to the topic. They must relate theories and concepts to the participants and recognize the value of experience in learning.

Goal-oriented: Adults are goal-oriented; upon enrolling in a course, they usually know what goal they want to attain. They, therefore, appreciate an educational program that is organized and has clearly defined elements. Instructors must show participants how this class will help them attain their goals. This classification of goals and course objectives must be done at an earlier stage of the training.

Relevancy-oriented: Adults are relevancy-oriented; they must see a reason for learning something. Learning has to be applicable to their work or other responsibilities to be of value to them [9]. Therefore, instructors must identify objectives for adult participants before the course begins. This means, also, that theories and concepts must be related to a setting familiar to participants. This need can be fulfilled by letting participants choose projects that reflect their own interests.

Practical: Adults are practical, focusing on the aspects of a lesson most useful to them in their work. They may not be interested in knowledge for its own sake. Instructors must tell participants explicitly how the lesson will be useful to them on the job.

Respect: As do all learners, adults need to be shown respect. Instructors must acknowledge the wealth of experiences that adult participants bring to the classroom. These adults should be treated as equals in experience and knowledge and allowed to voice their opinions freely in class.

Motivation: The best way to motivate adult learners is simply to enhance their reasons for enrolling and decrease the barriers. Instructors must learn why their students are enrolled (the motivators); they have to discover what is keeping them from learning. Then the instructors must plan their motivating strategies. A successful strategy includes showing adult learners the relationship between training and an expected promotion.

Retention: Students must retain information from classes in order to benefit from the learning. The instructors' jobs are not finished until they have assisted the learner in retaining the information. In order for participants to retain the information taught, they must see a meaning or purpose for that information. They must also understand and be able to interpret and apply the information. This understanding includes their ability to assign the correct degree of importance to the material.

The amount of retention will be directly affected by the degree of original learning. Simply stated, if the participants did not learn the material well initially, they will not retain it well either.

Retention by the participants is directly affected by their amount of practice during the learning. Instructors should emphasize retention and application. After the students demonstrate correct (desired) performance, they should be urged to practice to maintain the desired performance. Distributed practice is similar in effect to intermittent reinforcement.

Transference: Transfer of learning is the result of training, it is the ability to use the information taught in the course but in a new setting. As with reinforcement, there are two types of transfer: positive and negative [10].

Conclusion

Medical education is a fast growing field, as almost medical trainers and instructors use most of the available learning theories to achieve their targets, learning in medicine is a continuous process starting at the level of medical students and continuing up to the senior consultants' level. The general medical council in the United Kingdom has introduced many academic and professional targets for all doctors to continue practicing; this has further enhanced the application of adult learning in clinical practise.

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