

COMMENTARY

The ELEPHANT criteria in medical education: Can medical education be fun?

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Abstract

'Hilarity and a good nature [and] a breezy cheerfulness help enormously in the study and in the practice of medicine,' said Sir William Osler, Regius Professor of Medicine at Oxford, pioneering medical educationalist, and arguably one of the greatest physicians of all time (Osler W. 1905). We present evidence that (1) Encouraging Learning, (2) Entertaining People, and (3) Having a Nice Time are dangerously powerful adjuncts to medical education. These are, by acronym, the ELEPHANT criteria. Encouraging is the motivating heart of the matter. Entertainment engages the mind and has been shown to enhance working memory and recall. Enjoyment is associated with deep learning, which comes with a whole host of benefits. However, learning in fear and misery can be an effective tool – but for other reasons – and the pessimistic personality type may respond badly to 'fun learning.' Even so, medical education that fulfills the ELEPHANT criteria can be an effective tool in training young doctors.

Encouraging learning

Medical education can be disheartening. In Melbourne, Australia, 251 final year medical students were asked a series of questions regarding undergraduate surgical training; only 44% reported that they felt surgeons were approachable (Ek et al. 2005). First year clinical students in Belfast, Northern Ireland, reported that teaching time in teaching hospitals was often spent waiting for tutors – who, they complained, were often poorly prepared (Johnston & Boohan 2000). Is this encouraging – does it 'give heart' (encourage, from the French *coeur*, meaning *heart*)?

Why should we encourage? As one educationalist put it, 'when we encourage, we seek to create that perfect relationship between willingness and ability' (Bell 2007). Encouragement promotes optimism and self-esteem, two qualities which medical students can sometimes lack. In a study in a computer college, Danish educationalists showed that optimism and high self-esteem were correlated with exam success (Bennedsen & Caspersen 2008), and when tutors at Tokyo Women's Medical University School of Medicine gave structured encouragement to their class, they performed significantly better in problem-based learning classes (Yoshioka et al. 2005). Encouragement unlocks potential.

Entertaining people

Medical education can be boring. Only 26% of pre-clinical students at the University of Oxford agreed that they found their computer-assisted learning neuroanatomy course enjoyable (Svirko & Mellanby 2008). The students reported significantly lower deep learning approach scores for this

course compared to their studies in general. Boring education seems to encourage superficial learning.

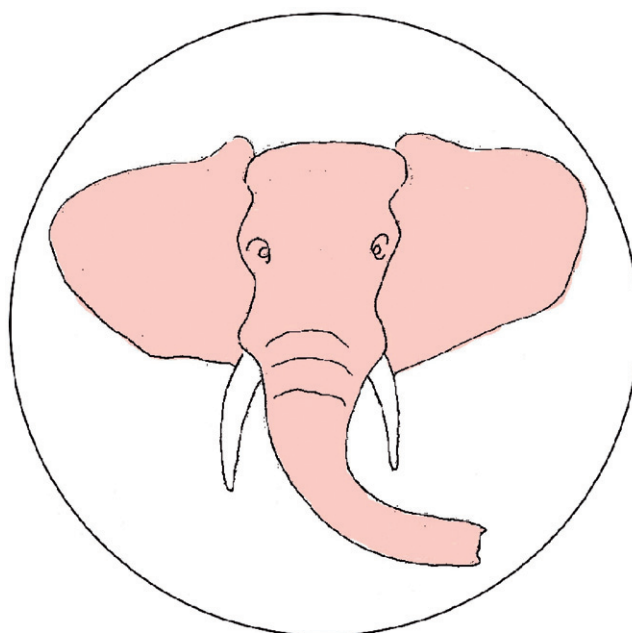
Entertainment may enhance memory. In one study, 10 young adults were shown a row of six pleasant, neutral, or unpleasant pictures, interspersed with six unrelated words (Erk et al. 2003). There was a significantly higher rate of word recall after seeing pleasant-mood inducing pictures (35.7%) than with neutral (23.9%) or negative-mood inducing pictures (23.6%) ($p < 0.05$). Functional Magnetic Resonance Imaging (fMRI) scanning compared brain activity during successful memorization to unsuccessful memorization. While seeing pleasant pictures, active areas during successful memorization included the right parahippocampal, fusiform, and lingual gyri. The right amygdala, associated with fear, was active while seeing unpleasant pictures and was associated with poorer word recall.

Verbal working memory was enhanced in another study. Sixty-six young adults were shown 10 min of amusing comedy, calming documentary, or anxiety-bringing horror (Gray et al. 2002). They were then shown a series of words and had to identify whether each word was the same as the word shown three previously, or not. Scores were best after comedy and worst with horror. Interestingly, the test was repeated with faces instead of words. Intriguingly, scores were best with horror and worst with comedy. The message here seems to be: If you want students to remember what you say, keep them amused, but if you want them to remember your face, make them anxious.

Having a nice time

Medical education can be miserable. First-year clinical students in Belfast rated the teaching they received for its enjoyability

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Encouraging Learning **Entertaining People** **Having A Nice Time**

(Johnston & Boohan 2000). Teaching hospitals received a significantly lower score (6) than general practitioners (8) or district general hospitals (8) ($p < 0.0001$). Interestingly, the students also rated the educational value of the less enjoyable teaching hospitals as lower (6) than the more enjoyable general practices (8) and district general hospitals (9) ($p < 0.0001$).

Should we be making medical education more enjoyable? The Oxford CAL study showed that enjoyment may be associated with deep learning (Svirko & Mellanby 2008); trying to understand and integrate knowledge, as opposed to surface, or rote learning. Svirko reminds us that deep learning is associated with better performance in work and exams, higher self-esteem, greater course satisfaction, and better clinical experience. Even if enjoyment were unrelated to learning, why would not we want medical students – who are often a miserable bunch – to enjoy themselves?

ELEPHANT in practice

Volkswagen has recently conducted a series of experiments. These including decorating a public staircase, which was beside an escalator, to resemble a piano. In this 'trial', 66% more people used the staircase compared to normal (thefuntheory.com). Medical students choose their learning

resources out-of-hours and have more options than ever before, including web-based materials. Do they choose fun? We found on YouTube.com an excellent example of medical education that fulfills the ELEPHANT criteria. 'Diagnosis Wenckebach' is a video made by students at the University of Alberta which teaches the key electrocardiographic features of the Wenckebach phenomenon to the tune of Justin Timberlake's popular ditty, 'Sexyback'.

But is fun always good? Erk et al. demonstrated activation of the amygdala during successful memorization of words while in an unpleasant mood. Although this was less efficient than memorization during a pleasant mood, which employed other areas of the brain, it could be more useful in certain situations. Theories of mood congruence and mood dependence propose that emotionally charged information is encoded and remembered best in a matching mood (Lewis & Critchley 2003). Thus, if a junior doctor needs to remember upsetting information in the dead of night – while in a foul mood – perhaps he ought to learn it in such a fashion. Vice versa, if a junior doctor wants to keep his spirits up and be a beacon of hope, he may benefit from learning in an ELEPHANT-based environment. Further research is needed. For these reasons, we have refrained from creating a set of contrary criteria. However, if we did, it could be named the WILDEBEAST criteria – Woefully Inadequate Learning,

Discouraging Everyone, Boring Everybody, and Awfully Sad Times.

For some individuals, ELEPHANT-based education (EBE) could even be detrimental. The Defensive Pessimism personality type expects failure: This motivates the individual to work harder and protects them from the trauma of actual failure. Optimists are the opposite and dream of success. Sanna (1998) reported the effect of amusing or depressing film clips on the ability to perform an anagram test in questionnaire-classified defensive pessimists and optimists. Optimists' scores were roughly similar after watching a happy film or no film, but were significantly worse after watching a sad film clip. Pessimists, however, did just as well having seen a sad clip as having seen no clip, but did significantly worse after having seen a happy clip.

The future of EBE

Alternatives and contraindications to EBE may exist, but this is one tool in the box that has not been fully put to use. Doctors in their clinical context are busy and under continual pressure; surely medical teachers worldwide could benefit from using a more efficient and enjoyable educational stratagem. This is a case of 'teach smarter'.

For the sake of our *students*, let us remember the words of King Solomon (*ca.* 900 BC), 'there is nothing better for a man than to enjoy his work' (Ecclesiastes 3:22 New International Version). If this makes happier doctors, then let us remember his words again, for the sake of our *patients*, that 'a cheerful heart is good medicine' (Proverbs 17:22).

We hope to encourage this study and use of the ELEPHANT criteria in our own institution and elsewhere. In particular, there are three main research aims: search, study, and synthesis. To search is to unearth and collect examples of EBE that are already present in the wild. To study is to quantify the effectiveness of ELEPHANT in medical education, comparing EBE versus conventional medical education. Lastly, to synthesize is to develop new and exciting educational tools that fulfill the ELEPHANT criteria.

Conclusion

One part of medical education is to fill our heads with knowledge, to teach our eyes to see, and to teach our hands new skills. In the experience of authors, medical schools are exceptionally good at this. However, medical education has one more job, and that is to make us passionate about what we do. This is why great teachers – of whom we are lucky to have many – are those who encourage and entertain us, because they like Osler have the skill to make us passionate about medicine. The student becomes the doctor, and our teachers help shape us into the doctors we become. Indeed, the word 'doctor' originates from the Latin '*doceo*', 'to teach'. We hope that the ELEPHANT criteria will help instill some passion in the next generation of doctors and teachers. People often ask us whether we can be serious about making medical

education fun; we are, and we echo the words of the 16th century French doctor and medical educationalist, François Rabelais:

'Put your prejudice aside, for, really, there's nothing here that's outrageous; nothing sick, or bad-or contagious. Seeing how sorrow eats you, defeats you, I'd rather write about laughing than crying; for laughter makes men human, and courageous' [Rabelais, 1532].

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Notes on contributors

ARAVINTHAN VARATHARAJ and HUGH GIFFORD are final year medical students at the University of Oxford. The ideas put forward in this article were first presented at the 2009 Annual Meeting of the Association for Medical Education in Europe (AMEE) in Malaga, Spain. Hugh Gifford may, or may not, have been wearing an elephant costume.

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