

Cost Benefit Analysis of Healthcare Professional Education on Patient Outcomes

Kieran Walsh, Stephen Maloney, Scott Reeves, Dragan Ilic,
George Rivers

Welcome – but what's it all about?

For every penny spent on medical education

Do we get benefit?

Learner, provider, commissioner, funder



Agenda

Introduction. Explanation of outcomes. KW

Cost analysis: an introduction. KW

Costing an educational programme – how to do it. Participative session where delegates work in small groups to conduct a mocked up costing of an educational programme. KW + all

Costing the benefits. Participative session where delegates work in small groups to brainstorm what benefits would be worthwhile and how they could be costed. KW + all

Linking the programme to the outcome. Interactive session where delegates discuss the challenges in doing this and how best to overcome these challenges. All

Discussion. Developing plans for research. Follow up. All .

Intended outcomes

Cost an educational programme

Choose educational outcomes that can be costed

Link the programme to the outcomes

Conduct simple cost benefit analyses

Follow up with you

ingentaconnect™

Home About us Search Advanced search

Home >> [Education for Primary Care](#), Volume 21, Number 6

NICE medical education modules: an analysis of cost-effectiveness

Authors: Walsh, Kieran¹; Rutherford, Alaster²; Richardson, Judith³; Moore, Philippa⁴

Source: [Education for Primary Care](#), Volume 21, Number 6, November 2010, pp. 396-398(3)

Publisher: [Radcliffe Publishing Ltd.](#)

[< previous article](#) | [view table of contents](#) | [next article >](#)

You have access to the full text electronic article

You, or the institution you are accessing from, have subscription access to this publication.



Output

Might write this up as a report of a symposium

If anyone would like to join me in co-authoring this, let me know

If anyone has any concerns about this, let me know

Depending on how it all goes

Also you are welcome to the slides and papers

Intro

Cost benefit analyses in medical education

- Background
- Case studies – e-learning, simulation

Background

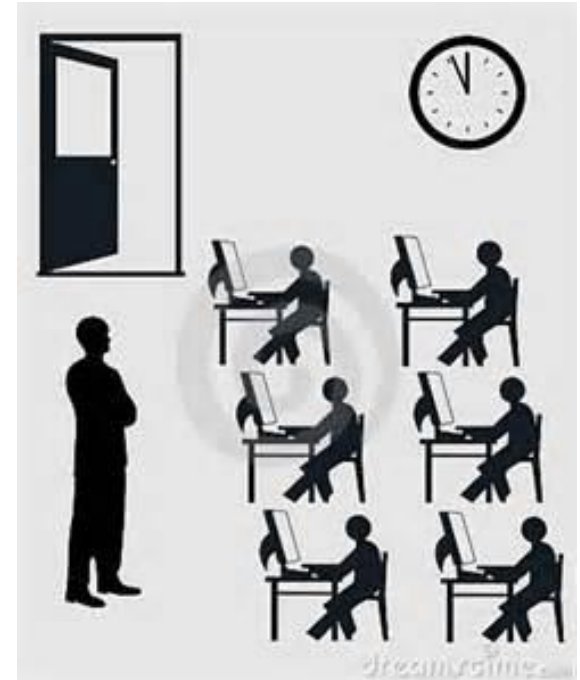
Truth 1

- Medical education is expensive
- Cost of medical education

UK ?

Internationally ?

- No one knows how much more
- Getting more expensive > inflation
- Especially expensive in the West - ?
- Most expensive country / least?
- Value??



Truth 2 – medical education of the past is going out to pasture

“A first year medical student recently commented to me that in every lecture he attended he fell asleep after 45 minutes or so. Of course, with my years of experience of medical education I reassured him that with time and some effort he would be able to achieve this in as little as ten minutes or less.”

Eugene Milne

Truth 2 – medical education of the past is going out to pasture

“A first year medical student recently commented to me that in every lecture he attended he fell asleep after 45 minutes or so. Of course, with my years of experience of medical education I reassured him that with time and some effort he would be able to achieve this in as little as ten minutes or less.”

Eugene Milne

Reassuring you are all still awake ... Early days ...

Truth 2 – progress in working out “what works” in medical education

The past	Now
Passive	Active
Different agendas	Evidence based
Learning things you don't need to know	Curriculum driven
Not learning things you need to know	Needs based
One size fits all	Learner centric
Points driven	Tailored
Just clinical	Communication, team

Truth 2 – progress in working out “what works” in medical education

The past	Now
Practise on patients	Simulation
Using the same formats	Blended learning
Not knowing	Feedback driven
Take it or leave it	Evaluated
Academic	Quality improvement and patient safety

The debate is moving on ...

What works

What works for a given cost



Truth 3 - we don't know what constitutes value for a given cost

High cost Low value	High cost High value
Low cost Low value	Low cost High value

Remarkable state of affairs

£5 billion

- too much / little
- sufficient benefit / insufficient

“unknown unknown”?



Truth 4 . . . because we don't really know what the costs are and we don't have cost analyses tools and we haven't really tried and we have little experience

Until now

Ground rules ... For my talk

- Cost = financial cost human cost
- Cost = cost . . . not institutional acceptance/ our way of doing things/ feasibility / other such words
- Evidence-based > emotional arguments
(education = motherhood and apple pie)
- Not a cost cutting guide OR an argument for investment
 - Ideologically neutral
 - Book – cut or invest ...

Case studies

- E-learning
- Simulation

E-learning – 3 questions

- Does it work?
- What are the costs?
- How can we ensure more value for a given cost?

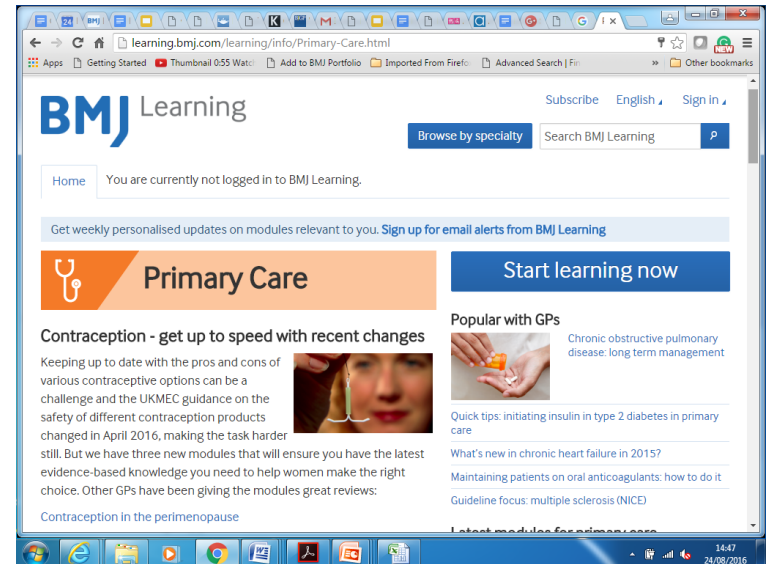
E-learning – does it work?



- Probably
- Many different forms already – reductionist
- As well as face to face learning – faint praise?
- Real attractiveness is not that it is better than face to face – more later

E-learning - what are the costs?

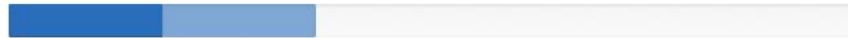
- Provider costs
- Learner costs
- Out of the frame
- Lets take them one by one
- Perspective is important! Whose cost?



E-learning - provider costs

BMJ Learning

Encouraging asthma self care



Encouraging asthma self care, with Dr Hilary Pinnock



- Website build
- Content – from text to virtual worlds .. populate
- Hosting .. small

E-learning - learner costs

E-learning - learner costs

“Free e-learning resources”!?

No such thing

E-learning - learner costs

- Hardware
 - Software
 - Depreciation ... and maintenance
 - Internet connection .. BB
 - Electricity, lighting . . .
 - Wages .. if learning at work
-
- Should you worry about this?
 - Could you say – “that’s your problem”?



E-learning - out of the frame

- Trainer accommodation
- Trainer travel and subsistence
- Learner accommodation
- Learner travel and subsistence
- Classrooms
- Equipment
- Off-the-job time
- Print costs

Happy slide – convenience and cost – but some spin

E-learning - how can we ensure more value for a given cost?

- Scale up content - populate
- Enable usage – 10/100/1000
- Map the content format to the outcome
- Interactive cases
- Just in time - ak
- Podcast
- Multimedia - behaviours
- Don't be seduced by technology - Princeton
- Share – institutions / teams
- Needs assessment
- Make it interprofessional

Simulation – new case study – same 3 questions

- Does it work?
- What are the costs?
- How can we ensure more value for a given cost?



Simulation - does it work?



1901 -

1909 -

Simulation - does it work?

- Integrated skills – clinical and communication .. integrate
- Practise and rehearse – as often as you like
- Safe for patient and learner – environment
- Patient expectations – training
- Patient safety
- Interprofessional
- Rare but important events – cardiac arrest in young
- Assessment

Simulation - what are the costs?

Simulation - what are the costs?

- Hardware
- Software
- Trainers
- Learners
- Patients

- TCO ??

- Car Simulation centre



Simulation – how can we ensure more value for a given cost?

- Don't be seduced by fidelity – commercial jet simulators
- Don't be seduced by technology
- Don't confuse fidelity with technology - GP
- Use the correct simulation for the task - part task / assessment
- Use the simulation to max capability neurosurgery
- Mobile simulation
- Share
- Ensure / enable usage – gym??

Task

Costing an educational programme – conduct a mocked up costing of an educational programme.

Costing the benefits - brainstorm what benefits would be worthwhile and how they could be costed.

Linking the programme to the outcome - Discuss the challenges in doing this and how best to overcome these challenges.

Discussion. Developing plans for research. Follow up.

Costing an educational programme – conduct a mocked up costing of an educational programme

Costs

- Is not price (cost + profit)
- Is not expenditure
- Is opportunity cost
- What is opportunity cost?

Costs

- Is not price (cost + profit)
- Is not expenditure
- Is opportunity cost
- What is opportunity cost?
- Not money – the cost of not doing something else

Gathering costs – ingredients approach

First step

Like cooking



Gathering costs – ingredients approach

- Must be comprehensive and exhaustive
- If anything is missed out, everything else will be wrong
- This is the denominator in your sum



Gathering costs – ingredients approach

- Identify all ingredients
- Even if they are free to you

- WHY?

Gathering costs – ingredients approach

- Identify all ingredients
- Even if they are free to you
- Because they may not be free to everyone ... who wants to replicate your programme

Gathering costs – ingredients approach

- Personnel
 - Facilities
 - Equipment and consumables
 - Learner inputs?
 - Others

- Personnel – 70%
- Hi cost – hi value



Gathering costs – ingredients approach

- Personnel
 - Pay closest attention to the biggest cost (personnel)
 - A small error here will have a big effect overall



How to identify ingredients

Become intimately familiar with the educational programme

- Programme documentation
- Interviewing the participants
- Observing the programme in action (planned, delivered, received curriculum)



Assign a cost to each ingredient

and add them up

Reporting costs

- In monetary terms

But

- Currency
- Inflation
- Education and cost practices

Reporting costs

In educational terms

- 100 hours of a senior lecturer's time
- 10 hours in a 50 seat lecture hall



Reporting costs

- Monetary terms
- Educational terms
- Be transparent



Conduct a mocked up costing of an educational programme

Conduct a mocked up costing of an educational programme - summary

- Personnel
 - Facilities
 - Equipment and consumables
 - Learner inputs?
 - Others
-
- Personnel – 70%
 - Hi cost – hi value

Conduct a mocked up costing of an educational programme

- **Personnel**

- Think about a programme that you plan to do or have done
- Cost it
- Small groups
- 10 minutes
- Barriers
- Report back

Cost analysis tools: Cost-

- Effectiveness
- Utility
- Feasibility
- Benefit

Cost effectiveness

- The evaluation of two or more alternative approaches or interventions according to their costs and their effects in producing a certain outcome
- Imply a comparison
- Easy to understand
- Guide decision making
- Cannot be used to compare interventions with different intended outcomes
- Cannot be used to compare interventions that do not have a “common measure of effectiveness that can be used to assess them”
- Causality – non-equivalence of groups, attrition, maturation, the effects of testing, and regression to the mean

Cost utility

- Examination of two or more alternatives according to their cost and their utility
- Utility means the satisfaction among individuals as a result of one or more outcomes or the perceived value of the expected outcomes to a particular constituency
- Cost utility analysis is closely related to cost effectiveness analysis – however, cost effectiveness analysis must use a single measure of effectiveness whereas cost utility analysis enables researchers to amalgamate many different measures of effectiveness into a single measure of utility

Cost utility

- Educators and learners may value one outcome above another
- One way to capture this is to assign different weights to different outcomes
- Allow multiple outcomes to be taken account of in the evaluation
- Force the stakeholders to reflect on the relative merits of different outcomes and to articulate the results of their reflections and record them
- A number of different methods may be used to assign “weightings”
- Subjective assessment
- Causality

Cost feasibility

- Measuring the cost of a proposed intervention in order to decide whether it is feasible (that is, whether it can or cannot be considered)
- Simple and quick to implement
- A concrete method to estimate costs
- Cannot help us decide between alternative approaches
- Nor can it help us decide if an approach is worthwhile as it doesn't look at the effectiveness or utility of an intervention or the benefits that may be associated with it

- Example – sim centre

Cost benefit

- “The evaluation of alternatives according to their costs and benefits when each is measured in monetary terms”
- Enable us to discover if any particular intervention on its own has benefits that exceed its costs
- Enable us to compare the costs and benefits of interventions with different outcomes
- Enable us to compare the costs and benefits of widely differing types of interventions in completely different areas
- Rely entirely on our ability to measure costs and benefits in monetary terms
- Causality

Table 2 Cost-benefit analysis

	Costs	Outcome	Benefit	Total benefits	Net benefit (total benefits – costs)
Simulation-based education	£20 000	8 complaints prevented	Benefit per complaint prevented = £1000	£8000	–£12 000
Communication skills teaching	£10 000	12 complaints prevented	Benefit per complaint prevented = £1000	£12 000	+£2000
Team-based learning	£25 000	5 medical accidents prevented	Benefit per medical accident prevented = £10 000	£50 000	+£25 000
Quality improvement education	£50 000	7 medical accidents prevented	Benefit per medical accident prevented = £10 000	£70 000	+£20 000

Task

Costing the benefits - brainstorm what benefits would be worthwhile and how they could be costed.

Linking the programme to the outcome - Discuss the challenges in doing this and how best to overcome these challenges.

Task

Discussion. Developing plans for research. Follow up.

Cost analyses can guide decision making but they should not necessarily make the decisions for us

You can have the most expensive option if you wish

Common errors



Common errors

- Omitting hidden costs – clinical/educational budgets
- Paying too little attention to the main costs
- Paying insufficient attention to opportunity costs - 10K fee + 20K lost earnings
- Mistiming costs
- Misunderstanding transfer of payments (doubling up)
- Failing to account for development costs
- Conducting the wrong analysis

Why is this important?

Why is this important?

- Payer
- Individual
- Institution
- Government

Or maybe it's not important at all

- Spend your budget ... or it will be taken away
- “Complexity payments” – fuzziness
- Primary purpose of a medical school: learning, research – blur
- Primary purpose of postgraduate training: learning, clinical care – blur
- The cost disease

More dilemmas

- Economies of scale ... Or maybe not ..
Not a factory
- Capacity utilisation – until fall over
- Human capital theory – a German unword
- Labour economics > health economics
- The cost of an OSCE – but what of its value

Truth 3 - we don't know what constitutes value for a given cost

High cost Low value	High cost High value
Low cost Low value	Low cost High value

Strategy – this is what we must do

- Individual studies - modest - realistic and achievable - tactical
- A series of systematic reviews
- Programmes to further the methodology
- Centres of excellence of cost and value in medical education
- Research programmes involving collaborations

The frontier



Brigham Young University L. Tom Perry Special Collections MSS 1608

References

Walsh K (ed). Cost effectiveness in medical education. Radcliffe: Abingdon, 2010.

Walsh, K., 2007. [Interprofessional education online: the BMJ learning experience](#). *Journal of interprofessional care*, 21(6), pp.691-693.

Schroter S, Jenkins D, Playle R, Walsh K, Probert C, Kellner T, Arnhofer G, Owens D. Evaluation of an online Diabetes Needs Assessment Tool (DNAT) for health professionals: a randomised controlled trial. *Trials* 2009, 10:63

Walsh K, Rutherford A, Richardson J, Moore P. [NICE medical education modules: an analysis of cost-effectiveness](#). *Educ Prim Care*. 2010 Nov;21(6):396-398.

Pell G, Fuller R, Homer M, Roberts T. [Advancing the objective structured clinical examination: sequential testing in theory and practice](#). *Med Educ*. 2013 Jun;47(6):569-77.

Walsh K. [Sequential testing: costs and cost savings may be greater](#). *Med Educ*. 2011 Dec;45(12):1262.

Cookson J, Crossley J, Fagan G, McKendree J, Mohsen A. [A final clinical examination using a sequential design to improve cost-effectiveness](#). *Med Educ*. 2011 Jul;45(7):741-7.

References

Walsh K, Levin H, Jaye P, Gazzard J. [Cost analyses approaches in medical education: there are no simple solutions.](#) Med Educ. 2013 Oct;47(10):962-8.

Walsh K, Ramani S, Gruppen L. Cost effective mentoring. Excellence in Medical Education. 2012. 1 (2) 19-23.

Howard J, Gibbs T, Walsh K. [Cost and quality of education for general practice.](#) Educ Prim Care. 2011 Mar;22(2):70-3.

Walsh K. [Medical education: A new pedagogy of the oppressed?](#) Med Teach. 2013 Sep 4

Walsh K. Ethics of cost analyses in medical education. Perspectives on Medical Education 2013: 10; 1007.

Walsh K. [An economic argument for investment in physician resilience.](#) Acad Med. 2013 Sep;88(9):1196.

Walsh K. [The Need to Evaluate Question Writers' Views and the Costs of Constructed-Response Versus Selected-Response Calculations Questions.](#) Am J Pharm Educ. 2013 May 13;77(4):86.

Walsh K, Jaye P. [The costs and utility of the Mini-CEX.](#) Med Teach. 2013 Sep;35(9):789.

Walsh K. [Decreasing the frequency of ordering tests or treatments.](#) JAMA. 2013 Feb 13;309(6):546-7.

Walsh K, Homer M. Medical student indebtedness. Med Educ 2013;47:326.

References

Walsh K, Jaye P. [Simulation-based medical education: Cost measurement must be comprehensive.](#) *Surgery*. 2013 Feb;153(2):302.

Walsh K, Jaye P. [The relationship between fidelity and cost in simulation.](#) *Med Educ*. 2012 Dec;46(12):1226.

Walsh K. [Money is the root of all progress.](#) *Med Educ*. 2012 Jun;46(6):625

Walsh K. [The full costs of patient educators.](#) *Med Teach*. 2012;34(6):509.

Walsh K. [Medical education: what the West could learn from Africa.](#) *Med Educ*. 2012 Mar;46(3):336.

Walsh K. [Cost in assessment - important to examinees who are paying to sit and governments who are paying to set.](#) *Med Teach*. 2011;33(7):592

Walsh K. [Incremental cost benefit of an innovation.](#) *Med Teach*. 2011;33(8):687.

Walsh K. [Defining and costing educational interventions.](#) *Med Educ*. 2011;45(10):1063.

Walsh K. [Cost-effective learning for cost-effective care?](#) *Acad Med*. 2011;86(12):1485-6.

Walsh K. [This thorough, tedious, expensive and disappointing study...!](#) *Med Educ*. 2010;44(11):1151