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REDEFINING MEDICINE, TRANSFORMING HEALTHCARE

Measurement instruments used in randomized clinical trials (RCTs) of eLearning of healthcare professionals: a systematic review protocol

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Presentation's overview

Background

The complexity of measurement

1. Why measure ?
2. When ?
3. How and how often?
4. Who does measurements ?
5. Who is being assessed/measured ?
6. Where (circumstances) ?
7. What is measured ?
8. Any more foreground questions ?

Why measure?

1. To allow comparability, transparency
2. To enhance credibility and integrity (quality) of learning
3. To demonstrate achievements, gains, changes
4. To promote personal growth, maturation, desirable values and attitudes
5. To document performance
6. To enhance School's/University's accountability, effectiveness and efficiency
7. To accredit achievement

- AND…

"One accurate measurement is worth a thousand expert opinions" (Grace Hooper)

When/how often?

1. Single testing (once only)
2. Once for entry and once for exit
3. Once every three years
4. Annually
5. Twice a year
6. Periodically
7. Longitudinally
8. Flexibly

How?

This largely depends on what is being assessed..

OR

the type of results the assessment seeks to obtain

IN GENERAL two types can be distinguished -> ->

A. direct assessments (e.g. of competencies, knowledge and skills)

B. indirect assessments of learning (e.g. as self-reporting, self-reflecting, self-assessing)

Typically used methods of assessment..

1. Tests
2. MCQs (e.g. metric-based assessments)
3. Observations
4. Video and/or audio recordings
5. Portfolios
6. Essays (e.g. open-ended assessments)

There are also different:

- Types of instruments (standardized vs. non-std.)
- Formats (metric-based vs. open-ended assessments)
- Numbers of items (range: 5-500)
- Durations of assessments (range: 5 min-5 hours)
- Standards of quality used in assessments (criterion-referenced assessment vs. norm-referenced assessment)

Who does measurements ?

1. Internally (faculty members, teachers, lecturers, etc.)
2. Externally (private companies, govt. bodies)
3. Self-examination/evaluation
4. Other students/ peers
5. Combined/mixed

Who is being assessed ?

1. Students (@ under or postgraduate levels)

2. Working professionals (GPs, doctors, AHPs, pharmacists, etc.)

Where?

ON–LINE.. and OFF–LINE

What is being assessed?

1. Knowledge (general, specific)
2. Skills (research, clinical, etc.)
3. Attitudes
4. Values
5. Competencies (communication, professionalism)
6. Satisfaction
7. Reflective practice/personal development

 … and probably a dozen of other competencies, values, perceptions, beliefs, and concepts..

Which is a daunting challenge…

Why?

I. Various taxonomies and classifications exist to categorise students' learning outcomes (Andrich, 2002)..

- Direct vs. indirect forms of measurement /assessment/evaluation
- Cognitive vs. non-cognitive outcomes
- Formative vs. summative evaluation

and assessment of outcomes is used to influence/improve teaching and, ultimately, learning.. (Volkwein, 2003, p.7)

Teaching

Learning

Outcomes
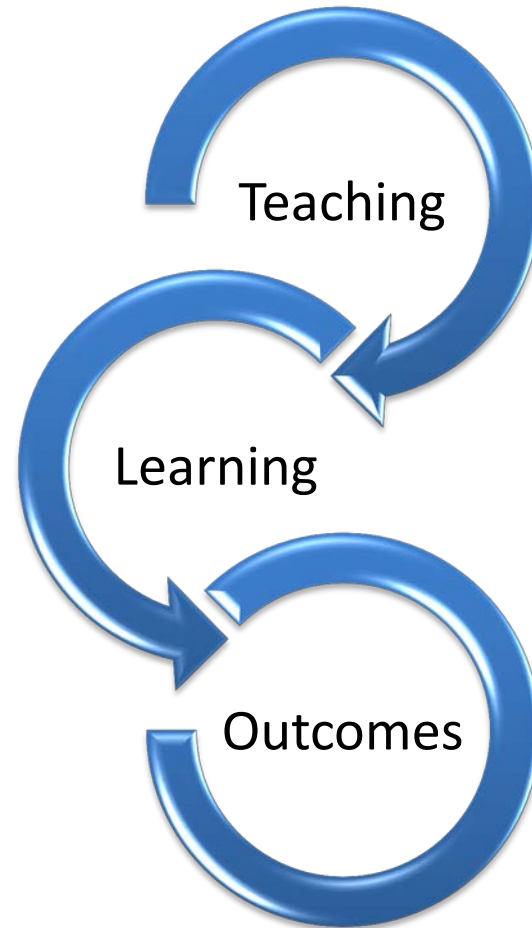
For example, formative assessment is a feedback loop in which...

II. Each school/University should have its own goals for student learning; and should develop suitable methods for measuring progress toward achieving educational goals (Volkwein 2003)

III. Learning has many dimensions some of which are easier to measure than others
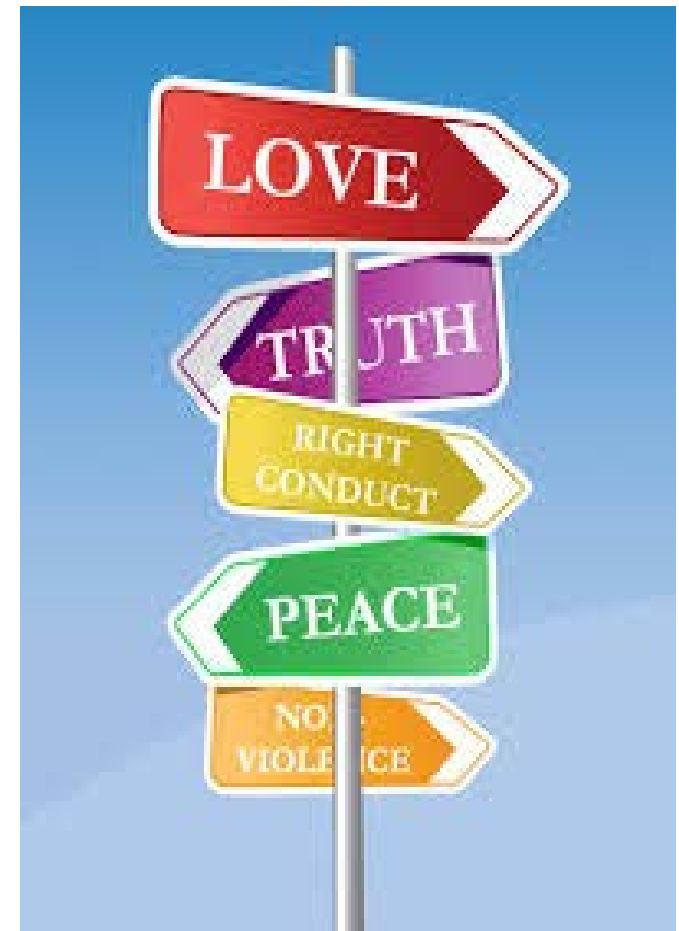
For example ->

Measurement of attitudes

Towards:

- medical profession (own identity)
- patients
- curriculum
- policy makers
- teachers
- other students
- academic facilities, and so on..

Measuring values can be even more complicated..

- Ethical
- Moral
- Professional
- Social/societal
- Personal/family
- Cultural/ethnical
- Environmental
- Political

Complexity of eLearning

- On-line or off-line
- Synchronous or asynchronous
- Digital Game-Based Learning
- Massive Open On-Line Courses
- Psychomotor Skills Trainers
- Virtual Learning Environments
- Virtual Patient Simulations
- mLearning
- Full eLearning or blended learning

Rationale for conducting systematic review

Numerous reviews of assessment instruments of LOs exist in the literature, none of those, however, focused on eLearning of healthcare professionals, hence the rationale.

Aims

1. To identify all measurement instruments used in RCTs of eLearning of health professionals

2. To evaluate the validity of the measuring instruments aimed at attitudes, knowledge, skills or satisfaction in studies of eLearning of healthcare professionals

3. To create recommendations for future research about the best measurement instruments available for research focused on eLearning for health professionals.

Methods

Searches:

- MEDLINE...........(via OVID)
- EMBASE............(via OVID)
- Cinahl...............(via EBSCO)
- British Education Index (via EBSCO)
- British Nursing Index
- Cochrane Central Register of Controlled Trials (CENTRAL)
- GOOGLE SCHOLAR
- ISI Web of Knowledge/Web of Science
- PSYCINFO
- SCOPUS
- Educational Resources Information Center (ERIC) (ProQuest)

Inclusion Criteria

Randomised controlled trials:

- involving healthcare professionals (both students and working professionals)
- reporting values, attitudes, knowledge, skills, competencies or satisfaction as POMs
- reporting any type of eLearning
- comparing eLearning or blended learning to: traditional learning; or an alternative eLearning or blended learning method

Exclusion criteria:

- uncontrolled design
- quasi-experimental
- qualitative studies
- the content of a tool is not related to the teaching method
- the differences between intervention and control groups are not reported for POMs
- the adjectives used in survey questionnaires do not accurately describe POMs

Data extraction:

1. Instrument's name and reference
2. No of items
3. Number and description of domains
4. Number of response options
5. Time needed to complete
6. Mode of administration
7. Instrument initially developed by
8. Methods used to develop instrument
9. Population in which instrument was validated
10. Target population
11. Scoring algorithm
12. The recall period
13. Study population
14. Reliability
15. internal-consistency (test-retest, inter-rater, intra-rater)
16. Validity (content, criterion, construct)
17. Floor and ceiling effects
18. Responsiveness
19. Interpretability

Optionally also:

1. Authors' names and publication date
2. Study duration
3. Study design
4. Participants
   - *a. Mean age*
   - *b. Sex distribution*
   - *c. Other demographics*
5. Intervention
   - *a.   learning method*
   - *b.   type of course*

6. Comparators
   - *a.   Number of intervention groups*
   - *b.   Description of the intervention*
   - *c.   Description of intervention in control group (duration, dosage)*
   - *d.   Sample size in each group*
   - *e.   Mean age in each group*
   - *f.   Other demographics in each group*

Quality assessment

Consensus-based Standards for the selection of health status Measurement Instruments (COSMIN) checklist (Terwee et al., 2007):

1. Content validity
2. Internal consistency
3. Construct validity
4. Reliability
5. Absolute measurement error
6. Responsiveness
7. Interpretability

Scoring: +, ?, -, or 0 (high, intermediate, low, not done)

Conclusions

1. Our research aims to address an important gap in the current evidence-base; and delineate standardised vs. non-standardised instruments measuring LOs/educational attainment of various healthcare professionals using eLearning

2. This will allow greater comparability of research results and more meaningful conclusions to be drawn in future eLearning research

3. Our research has the potential to inform policy makers.

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Any Questions ?

THANK YOU