Meaningful Outcomes in Program Evaluation of Online Learning

Walter Tavares, PhD
Scientist | Assistant Professor, The Wilson Centre & Post MD Education Department of Medicine, University of Toronto
walter.tavares@utoronto.ca
Twitter: @WalterTava

David Wiljer, PhD
Executive Director, Education Technology Innovation, UHN;
Associate Professor, University of Toronto
david.wiljer@uhn.ca
Twitter: @wiljerd

David Rojas PhD
Evaluation Scientist, Women’s College Hospital;
Assistant Professor, University of Toronto
David.rojasgualdron@gmail.com
Twitter: @David_rojas_G
Disclosures

Walter Tavares and David Wiljer are recipients of the Manning Grant and have funding from other government and nonprofit granting agencies. David W. and Walter are on the SACME Board of Directors.
Objectives

By the end of this workshop participants will be able to:

• List and discuss principles of program evaluation applied to online formats of CPD
• Describe outcome frameworks that focus on change and can be applied to online formats of CPD
Who I am...Briefly

Walter Tavares, PhD
Scientist | Assistant Professor, The Wilson Centre & Post MD Education Department of Medicine, University of Toronto
walter.tavares@utoronto.ca
Twitter: @WalterTava
A different kind of driver…
Rapid Retooling, Acquiring New Skills, and Competencies in the Pandemic Era: Implications and Expectations for Physician Continuing Professional Development

David W. Price, MD; Craig M. Campbell, MD

**Abstract:** The SARS-CoV-2 (COVID 19) pandemic has necessitated changes in health care delivery, including increases in delivery of care through asynchronous or virtual means, and deployment of clinicians in different teams and settings. Physical distancing and redeployment of clinicians has also necessitated changes in health care continuing professional development (CPD). Health care delivery and CPD is unlikely to fully return (in the near term, if at all) to pre-pandemic status. The authors raise questions and opportunities for development and provision of CPD during and after the pandemic.

**Keywords:** continuing professional development, CPD, technology-enabled CPD, re-imagining CPD, retooling, new skills and competencies

DOI: 10.1097/CEH.0000000000000297
Online Education:
learner interaction with content / people via the internet;
can be directed or self directed. But too many variations
and advances for a typology to work fully

Context of Lifelong Learning

Defined as “a continuously supportive process that stimulates and empowers individuals to acquire all the knowledge, values, skills and understanding they will require throughout their lifetimes and to apply them with confidence, creativity and enjoyment in all roles, circumstances and environments”

Longworth N. International Handbook of Lifelong Learning 2001 (p.259)  
Hojat et al. 2003; Hojat, Veloski, Erdmann, & Gonella, 2006
Remote Emergency Teaching and Online Education/Learning?

Highly variable design solutions

- Distance
- Distributed
- Blended
- Online
- Mobile
- And others….including “emergency remote teaching” the common alternative to high quality online education

- Requires and ecosystem...
- Some not fully featured, or necessarily well planned with high probability of suboptimal implementation
- “temporary” shift of instructional delivery.....


A remotely conducted paediatric bootcamp for fourth-year medical students

Rebekah Burns

Jesse Wenger

Department of Paediatrics, University of Washington, Seattle, Washington, USA

Correspondence: Rebekah Burns, Department of Paediatrics, University of Washington, 4800 Sand Point Way North-east, M.B7.520, Seattle, Washington 98105, USA. Email: rebekah.burns@seattlechildrens.org
An Example

Medical Education Adaptations

Online faculty development using cognitive apprenticeship in response to COVID-19

Ayat Nabil Eltayar | Noha Ibrahim Eldesoky | Hoda Khalifa | Soha Rashed

Correspondence: Ayat Nabil Eltayar, Department of Medical Education, Alexandria Faculty of Medicine, Alexandria University, Champollion Street, El-Khartoum Square, Azarita Medical Campus, Alexandria, Egypt.
Email: dr.ayateltayar@yahoo.com
A Look Into Two Camps

Camp 1

• This is a pandemic
• Outcomes are different
• This is temporary…not ideal
• Evaluation not feasible / necessary (at least not now)

Camp 2

• This is a pandemic
• New normal
• Needs / implications are elevated
• Evaluation is elevated…because consequences are significant and future is uncertain
A focus on **OUTCOMES?**

**Changes** in awareness, knowledge, skill, behaviour etc.

- People, organizations, short, med, long
- Their enactment is dependent on preceding efforts, but comes first
A focus on **IMPACT**?

Ultimate intended change in organization, community or other system... outcomes inform intended impact
Select OUTCOMEs?
Jot that down...
What informed those choices of OUTCOMES?

How might we optimize or think about that differently?
Evaluation Scientist

Who am I, briefly

David Rojas PhD
Evaluation Scientist, Women’s College Hospital;
Assistant Professor, University of Toronto
David.rojasgualdron@gmail.com
Twitter: @David_rojas_G
Conceptualization of Program Evaluation

Traditionally: Determine the effectiveness or value of a program (Binary Dichotomony)

Broader literature: Systematic process of data collection and analysis around activities, characteristics, and outcomes of programs that can be used to make judgments OR inform future program refinement. (Patton, 1997)
Program Evaluation approaches by “Purpose”

DEVELOPMENTAL

Innovations. Iterative cycles to support implementation

Maturity of the “Unit of Analysis”

FORMATIVE

Foster development and improvement within an ongoing activity.

SUMMATIVE

Determine whether an established activity goals have been met.
“When the cook tastes the soup, that's formative; when the guests taste the soup, that's summative” (Stake, 2004)

When the host is planning what to do for the guest, that’s developmental - Rojas
Program Evaluation approaches by “Purpose”

**DEVELOPMENTAL**

**Innovations.** Iterative cycles to support implementation

**FORMATIVE**

Foster development and improvement within an ongoing activity.

**SUMMATIVE**

Determine whether an established activity goals have been met.
How about Program evaluation during COVID?
Program Evaluation Components

PURPOSE
Level of Maturity (Unit of analysis)

AUDIENCE

DATA UTILIZATION

PARTICIPANTS (Same)
Purpose: Does it change?

The level of maturity of the Unit of analysis changes.
Unit of Analysis Changed

Evaluation

In person teaching
Did it meet its goals?

Online teaching
Did it meet its goals?

Round-up
This course helped me improve my work-related skills significantly.

Strongly disagree  Disagree  Neutral  Agree  Strongly agree

Submit your answer ➔
Audience & Data Utilization

How does it change now that purpose has changed?
Purpose changed
CORE Principles

The maturity of the unity of analysis would help inform the evaluation purpose and the question.

The evaluation “purpose” can inform the types of outcomes to be captured/analyzed.

New platforms and technologies offer the opportunity to focus on different/new outcomes, however, it is important to have a purpose for the collected data. How is it going to be used? What would it inform?

Determine whether the theoretical underpinnings would remain the same for the learning activities (Unit of analysis). This is important as the “program theory” would help inform the expected change and the associated outcomes.

Always close the loop. Show what has been done with the collected data and (when possible) report back to your participants. [response rate]
Reflecting on the case studies

Online Faculty Development during COVID (Eltayar, et al., 2020)
• Cognitive apprenticeship model
• Effectiveness measured by quality of new questions – could there be other outcomes? [participants perceptions – less interference/better participation]
• Outcomes informed by conceptual framework

Remote pediatric Bootcamp (Burns & Wenger, 2020)
• Pre-existing curriculum could be adapted to remote format (no mention of the theoretical framework). Replacement for activities.
• Sessions were highly rated (that does that imply?)
• No formal feedback collected from facilitators (Participatory evaluation)
• The model was successful – what does it mean?
Who am I, briefly

David Wiljer, PhD
Executive Director, Education Technology Innovation, UHN;
Associate Professor, University of Toronto
david.wiljer@uhn.ca
Twitter: @wiljerd
Outcome Frameworks

Outcome Frameworks

Framework for Developing Master Learners in Competency Based Education

Developing Master Adaptive Learners
Quadruple AIM, Institute for Healthcare Improvement
Quintuple Aim

FIGURE S-1 | Advancing to the Quintuple Aim
SOURCE: Developed by publication editors

National Academy of Medicine, AI and Healthcare, 2020, pre-proof
Original RE-AIM 1999

- First publication in 1999
- Initially used to evaluate prevention and health behavior change programs
- RE-AIM Trivia: was going to be called ARIEM (actual order of the RE-AIM ‘steps’)

Develop and translate research and practice-based interventions that can:

- be *adopted (and adapted)* and delivered broadly,
- have the ability for *sustained* and consistent *implementation* at a reasonable cost
- *reach* large numbers of people especially those who can most benefit,
- produce *replicable* and *long-lasting implementation and population outcomes*
PRISM CONTEXTUAL FACTORS

EXTERNAL CONTEXT
- EXTERNAL ENVIRONMENT
  - POLICY
  - RESOURCES
  - GUIDELINES
  - INCENTIVES

INTERNAL CONTEXT
- MULTI-LEVEL ORGANIZATIONAL & PATIENT CHARACTERISTICS
- MULTI-LEVEL ORGANIZATIONAL & PATIENT PERSPECTIVES (VALUES)
- IMPLEMENTATION & SUSTAINABILITY INFRASTRUCTURE

Fit among and Interactions among ALL of:
- INTERVENTION COMPONENTS
- IMPLEMENTATION STRATEGIES
- INNER & OUTER CONTEXT
- RE-AIM DIMENSIONS

Overarching Issues
- PROPORTION / PENETRATION
- REPRESENTATIVENESS
- REASONS: HOW & WHY
- ADAPTATIONS
- COSTS, BENEFITS & VALUE

PRISM = Pragmatic Robust Implementation and Sustainability Model.

FIGURE 1 | Revised, enhanced RE-AIM/PRISM 2019 model.

doi:10.3389/fpubh.2019.00064
NASSS Framework: Non Adoption, Abandonment, Scale-Up, Sustainability and Spread

<table>
<thead>
<tr>
<th>1. CONDITION</th>
<th>2. TECHNOLOGY</th>
<th>3. VALUE PROPOSITION</th>
<th>4. ADOPTERS</th>
<th>5. ORGANISATION</th>
<th>6. WIDER SYSTEM</th>
<th>7. EMBEDDING AND ADAPTATION OVER TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A Nature of condition or illness</td>
<td>2A Material properties</td>
<td>3A Supply-side value (to developer)</td>
<td>4A Staff (role, identity)</td>
<td>5A Capacity to innovate</td>
<td>6A Political / policy context</td>
<td>7A Scope for adaptation over time</td>
</tr>
<tr>
<td>1B Comorbidities</td>
<td>2B Knowledge to use</td>
<td>3B Demand-side value (to patient)</td>
<td>4B Patient (passive v active input)</td>
<td>5B Readiness for this technology</td>
<td>6B Regulatory / legal issues</td>
<td>7B Organisational resilience</td>
</tr>
<tr>
<td>1C Socio-cultural factors</td>
<td>2C Knowledge generated</td>
<td></td>
<td>4C Carers (available, type of input)</td>
<td>5C Nature of adoption / funding decision</td>
<td>6C Professional bodies</td>
<td></td>
</tr>
<tr>
<td>2D Supply model</td>
<td>2E Who owns the IP?</td>
<td></td>
<td></td>
<td>5D Extent of change needed to organisational routines</td>
<td>6D Socio-cultural context</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5E Work needed to implement and evaluate the change</td>
<td>6E Inter-organisational networking</td>
<td></td>
</tr>
</tbody>
</table>

Greenhalgh et al., J Med Internet Res, 2017
Core Principles

• The shift to online interventions creates new opportunities to assess impact and outcomes.
• Existing outcomes frameworks still play an important role in the development and implementation of the evaluation.
• The evaluation question and context will determine the selection of the appropriate framework.
• The frameworks should focus not only on the benefits but also on challenges of the technology.
• The online delivery creates new opportunities for data collection, before, during and post intervention and this data can help guide both the learner and the educator.
• The frameworks need to evolve to consider the context of key issues such as equity, diversity and inclusion.
Reflecting on the Case Study

• The evaluation framework needs to include:
  • The longitudinal aspects of learning;
  • The different modalities of learning;
  • The impact of different interactions;
  • The user experience and its the impact on learning;
  • The ability to provide feedback through the online experience;
  • The social aspects of online learning;
  • The unintended consequences and unintended benefits.
Why those OUTCOMES?
How might we optimize or think about that differently?
The Role of Theoretical Frameworks

How might we better optimize or think about outcomes?
The Role of Theoretical Frameworks

• When the focus is intended to be on WHY a program is succeeding or failing
• Helps to identifying mechanisms that mediate between program processes and intended outcomes

“To generate understanding of why programs operate the way they do, evaluators must articulate a plausible and defensible conceptual framework (i.e, theory) that explains the mechanism by which program processes lead to outcomes” Haji et al., 2013

The Role of **Principles**

How might we better optimize or think about outcomes?
The Role of **Principles**

How might we better optimize or think about outcomes?

- **Techniques at the surface**
  - Contextual factors that can be tailored to local settings

- **Principles in the middle**
  - Generalizable and relatively stable approaches to establishing learning conditions

- **Philosophy at the core**
  - The learning conditions that must hold for the intervention to be what its designer claims its is

In closing....

More than “working” or “not working”....circumstances under which different approaches to online education meets intended purposes at different levels, and why.
Meaningful Outcomes in Program Evaluation of Online Learning

Walter Tavares, PhD  
Scientist | Assistant Professor, The Wilson Centre & Post MD Education Department of Medicine, University of Toronto  
walter.tavares@utoronto.ca  
Twitter: @WalterTava

David Wiljer, PhD  
Executive Director, Education Technology Innovation, UHN;  
Associate Professor, University of Toronto  
david.wiljer@uhn.ca  
Twitter: @wiljerd

David Rojas PhD  
Evaluation Scientist, Women’s College Hospital;  
Assistant Professor, University of Toronto  
David.rojasgualdron@gmail.com  
Twitter: @DavidRojasGualdron

Thoughts / Questions?