Best Practice for Assessing Achievement of Experiential Education (ExEd) Learning Outcomes: A Systematic Literature Review

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INTRODUCTION

Assessment drives learning (1) therefore it is incumbent on ExEd programs to provide effective, clear and consistent (2) learning outcomes and outcome assessments describing the level to which a student must perform to be successful on rotation. The Canadian Experiential Education (CanExEd) Project for Pharmacy completed a systematic literature review to determine best practices pertaining to assessment of students within ExEd settings. The findings would be applied to the prototype for a pan-Canadian approach to student assessment within ExEd.

METHODS

CINAHL, EMBASE, ERIC, IPA, Medline, Scopus were searched using the terms:

Assessment or Evaluation
AND
Performance or Competence
AND
Experiential or Clinical or Field placement or Rotation or Practic*
AND
Preceptor or Assessor or Rater or Supervisor or Staff or Faculty
AND
Student

Inclusion criteria: English, years 1994-2014

In addition, Canadian ExEd faculty provided articles germane to the topic. Abstracts were reviewed and relevant articles retrieved and summarised using a data extraction tool. The QUESTS (3) criteria (Table 1) as developed by the Best Evidence for Medical Education (BEME) Collaboration was used to appraise the quality of evidence according to the number of QUESTS criteria satisfied (Table 2).

Table 1: BEME Collaboration QUEST Criteria

Letter	Criteria
Q	Quality of the evidence from a design standpoint
U	Utility or the degree a method can be transferred and adopted
E	Extent or amount of evidence
S	Strength of the evidence statistically
T	Target or question addressed and how it was measured
S	Setting of the evidence in both context and population

Table 2: Appraisal System

Grade	Number of QUESTS Criteria Satisfied
High	5-6
Medium	3-4
Low	0-2

QUANTITATIVE RESULTS

A full citation list is available within the full report at: http://afpc.info/content/canexed-reports

Figure 1: Article inclusion flow diagram

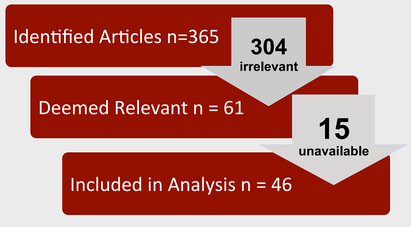

Table 3: Discipline Origins

Discipline	Citations (#)
Medicine	20
Pharmacy	12
Nursing	4
PT/Kinesiology	3
Psychology	2
Interprofessional	1
Social Work	1
Osteopathy	1
Massage Therapy	1
Total	46

Table 4: Quality Ratings

Quality Rating	Citations (#)
Good	13
Medium	17
Poor	16
Total	46

QUALITATIVE RESULTS

Assessment…	Description
Congruent with purpose	Student learning is considered the major purpose of assessment. Assessments can also certify a learner for licensure and evaluate programmatic educational outcomes (3)
Induces reflection	The act of reflection enables the learner to self-assess. Self-assessment is critical for informing life-long learning in a self-governing profession where practitioners must "generate a capacity for finding an effective balance both in daily practice and in setting personal learning goals. In daily practice, a balance of confidence and caution, of persistence and flexibility, of experimentation and cooperation"(4,5). Discussion with supportive and trained peer(s) such as a preceptor prevents unquestioned judgement and self-absorption (7).
Aligns with learning outcomes	Rotation participants require clarity of performance expectations which are ideally expressed as learning outcomes. The assessment indicates whether a student has met the outcomes or objectives. Because the same problem can evoke different strategies (tasks and processes) for arriving at the same solution, high-stakes assessments of professional students should be outcome-based rather than task- based or process-based.(3) The further performance is reduced to discreet actions, the greater the risk of inconsistency in a preceptor's observations, perceptions and judgments.
Rater Accuracy	Structured forms direct assessor attention to specific dimensions of performance. Rater accuracy increases with structured forms.(6)
Ease of Use	Instruments should be short (maximum 10 domains plus one global item) and should use a maximum of 5-7 rating levels(6). The ideal number of ratings/rubric categories per assessment domain has yet to be established. The cognitive effort required of preceptors should not exceed that causing rater error(7). Rater fatigue can occur with long assessments. Implementation of supplementary assessments may be required for struggling students to better identify performance issues and provide in-depth formative assessments. They would also allow structured midpoint and final assessments to remain brief for the adequately performing vast majority of participants.
Authenticity	Meaningful assessments focus on the impact of performance on the patient and care team (6,8) Participants are motivated to complete assessments fully if the form is congruent with the goals of clinical work in general.
Clear Description Standards	Domains and descriptive performance ratings (or rubrics) minimize uncertainty in preceptor judgment. Collaboratively-developed rubrics are available from the Association of American Colleges and Universities (https://www.aacu.org/value-rubrics). Domains should be ordered according to priority with the most important domain in first position. It is also important to facilitate flexibility in the use of free-text writing opportunities.(9)
Criterion-Referenced Grading	The minimum standard acceptable for passing is decided before the assessment occurs.(10)
Multi-Source Feedback	The number of administrations is more important than the number of questions asked (11) therefore, feedback tools should aim to globally assess performance and be simple and short to facilitate other health care providers, peers and patients providing feedback to students. Students can provide cards or electronic links to assessors to collect this data.(8)
Prompt Documentation	Assessors are more accurate when ratings are recorded immediately. The use of short pocket forms or personal mobile devices encourages prompt reporting of formative feedback assessments.
Tool Validity	Tool must actually test the learning outcomes it sets out to test (10,12). ExEd courses provide opportunity for achieving high-level educational outcomes so global and holistic judgment is required. Judgments of highly complex behaviour are induced through use of commensurate language within the assessment form.
Tool Reliability	The measure of the reproducibility or consistency of an assessment tool should be considered in the development of the tool/s of assessment. A generalizability coefficient of 0.8 is considered the minimum value for reliability(10) and that 6-12 raters per student(13) are needed to achieve this within norm-referenced grading (tests) rather than the criterion-based rating that ExEd uses. Nevertheless, frequency of assessment is more important than the standardisation of the tool or the training in its use.(6,12,14,15)

DISCUSSION

The issue of / parameters surrounding student assessment within controlled academic environments (written tests, objective structured clinical exams, etc.) has received considerable attention in the literature; however on-site assessment of practice is unique to ExEd and poses particular challenges. ExEd learning environments are far less controlled and more variable than other educational settings. In ExEd settings, *"Performance can be seen as the result of competence combined with the conditions which both enable and impose boundaries on the practitioner."*(16)

Literature pertaining to assessment in the ExEd environment is of medium quality with descriptive studies predominating. Medical literature provides novel approaches for surmounting the challenges inherent in assessing students in clinical placements.

ExEd 'courses' are high-stakes and represent the culmination of all learning to date for students. The literature does not provide a gold standard for assessing pharmacy students' performance in the ExEd environment; but theoretical parameters and tools from other health disciplines provide valuable parameters for such. Whatever prototypes may be developed in future are best shaped collaboratively with stakeholders in order to meet academic requirements and preceptor and student needs.

This literature review was conducted with the eventual goal of developing a National ExEd assessment strategy for Canadian pharmacy programs however the findings may apply to any field concerned with measuring academic performance in professional environments. Striking a balance that provides adequate helpful information to students, maintains rigor and reliability, and is acceptable in length and ease for supervising preceptors will be challenging and may require an iterative approach as well as multiple tools to meet the criteria identified within this review.

CONCLUSION

Current literature does not provide a gold standard ExEd assessment strategy for Pharmacy. Medical literature provides the greatest evidence and theory guiding the development of a Canadian solution to ExEd assessment. There are 12 criteria that should be met in the eventual prototype.

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