

1 Title

2 How do learners respond to and use feedback? A BEME Scoping Review

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4 Cover sheet

5 Group members and their relevant expertise

6 Dr. Muirne Spooner, lead reviewer. She is a medical practitioner and educationalist.

7 She has twelve years of experience working in undergraduate and postgraduate

8 education in RCSI Dublin and RCPI, respectively. She has presented her work

9 nationally and internationally, and has been the recipient of a NAIRTL grant (NAIRTL

10 was the National Academy for the Integration of Teaching and Learning, now known

11 as the National Forum for the enhancement of Teaching and Learning in Higher

12 Education) She is a member of the Royal College of Physicians in Ireland General

13 Internal Medicine Part 2 Clinical Skills Exam Board. She has received the RCSI

14 NCHD (Non-consultant hospital doctor) teaching award five times, the RCSI

15 President's Teaching Award and an Irish National Teaching and Learning Forum

16 Teaching Hero Award. She is undertaking this study as part of institutional research

17 in to feedback.

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19 Prof. Teresa Pawlikowska .is the Inaugural Director of the Health Professions

20 Education Centre at RCSI Dublin. She is a medical doctor and educationalist,

21 and has contributed to the development of BEME and reviewing since she

22 joined RCSI in 2013.Her particular research interest is student learning and

23 how faculty development and supports student learning . One aspect of her

24 research role is focused on developing RCSI as a BICC and underpinning

25 faculty development in reviewing in health professions education as well as

26 supporting educational research in mixed methods across the RCSI

27 constituent Schools (Medicine, Nursing, Pharmacy and Physiotherapy in

28 Dublin and other global sites). Previously Prof. Pawlikowska was elected to

29 the EGPRN board where she served for 8 years and developed research

30 methods courses for a wide variety of audiences in the EU. She has been

31 invited as a lecturer and as an external evaluator for a number of European

32 educational projects and as a result is visiting professor at Malmo/Lund

33 University. Teresa has held posts in an established medical school (University

1 College London) and the largest new graduate-entry medical school in the UK  
2 (The University of Warwick). As Head of the International Unit at UCL she  
3 delivered a variety of programmes in diverse environments as part of EU  
4 PhARE and World Bank projects.

5 Dr. Catherine Duane is a clinical lecturer in the Department of Medicine,  
6 RCSI. She has experience in Cochrane Systematic review and has  
7 undertaken a post-graduate diploma in Health Professions Education.

8 Dr. Jane Uygur, MD, CCFP, MCISc, is a Clinical Competency Tutor in the  
9 department of General Practice, RCSI, Dublin. She has previously completed  
10 a BEME review.

11 Mr. Paul Murphy, MLIS, is an information specialist with the Library, Royal College of  
12 Surgeons in Ireland, and he was previously medical librarian of University College  
13 Dublin. He is a member of the European Association for Health Information and  
14 Libraries. Paul has extensive expertise in literature searching for clinical systematic  
15 reviews, clinical guidelines, Best Evidence Medical Education (BEME) reviews,  
16 and evidence summaries.

17 Dr. Erica Smyth is the Research Officer in the Health Professions Education  
18 Centre and BEME coordinator for the RCSI BICC. She is an experienced  
19 researcher and is involved in providing methodological support for BEME and  
20 other systematic reviews

21 Mr. Brian Marron, MSc Human Ecology, BA Psychology and Geography, is a  
22 research assistant with experience in both qualitative and quantitative  
23 research methodology.

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2 Contact Details of Lead Reviewer

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1 Glossary of terms

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3 • Learners are defined for the purpose of this study as anyone engaged in a  
4 programme of teaching and/or training who will regularly be undertaking  
5 performance review and thus be in receipt of feedback. This includes  
6 undergraduate and postgraduate learners, and employees receiving  
7 professional development feedback.

8 • Supervisors are defined as anyone in a role that requires them to provide  
9 feedback to a learner. This may be for example, an academic or clinical  
10 supervisor and/or a line manager.

11 • Programmatic assessment is defined as a model of assessment which entails  
12 frequent, low-stakes assessments (with multiple raters and multiple  
13 instruments), focussing on narrative feedback, with the purpose of informing  
14 learners to achieve personal professional development (van der Vleuten  
15 &Schuwirth, 2005)

16 • There are many definitions of feedback, the implication of which is discussed  
17 in more detail later in this document, under “Background” and a pragmatic  
18 approach derived by educational utility is adopted.

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20 Keywords: Feedback recipience, feedback acceptance, feedback use, feedback  
21 response.

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Abstract

Feedback has long been considered one of the key factors in positively influencing academic achievement. However recent research indicates that the benefits of feedback may be heterogeneous, and dependent on a variety of learner, rater and environmental factors. Furthermore, while improved performance post-feedback is frequently reported, much less is known of the process by which feedback affects the learner, to result in these observed changes in attainment. As programmatic assessment becomes universally embedded in curricula, there is a shift from a focus on assessment of learning to assessment for learning, with the purpose of developing learner competence through regular, rich, narrative feedback. With this evolution in mind, it becomes crucial to unpack the impact that feedback has on the learner, if any, following the feedback event. The aim of this review is to map what is known of how learners interact with feedback to advance the conversation on how feedback affects their learning strategies and so explore if there are elements of feedback which enhance or inhibit learning.

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1. Background to the topic

There is a global trend towards programmatic assessment in undergraduate medical schools. Programmatic assessment centres on the provision of frequent low-stakes formative workplace-based assessment in which narrative feedback is rooted, with the purpose of informing learners to achieve personal professional development (van der Vleuten &Schuwirth, 2005). Feedback has long been considered one of the key factors in effecting transformational change in learners. (Black & William, 1998; Hattie & Timperley, 2007). There is increasing research to support that the benefit of feedback is variable and dependent on a number of heterogenous factors. (Kluger and DeNisi, 1996; Winstone et al, 2017). Furthermore, while learner perception of feedback value and its effects on performance are frequently reported, much less is known about how learners react to feedback and the subsequent actions taken. What is their response to feedback and how do they use feedback in their learning? In this current context, it is important to review the medical education literature to better understand these concepts, which will inform how feedback interventions may be optimised to potentiate learning.

1 Feedback theory has been concentrated in two main areas. Much of the research  
2 has resulted in developing frameworks on how to give feedback, which focus on  
3 transmission models aimed at rater/teachers as feedback providers (Ilgen, 1979,  
4 Nicol and MacFarlane-Dick, 2006). Hattie's (1999) review of over 500 meta-  
5 analyses identifies feedback as one of the major positive influences on academic  
6 achievement. However, Kluger and deNisi's (1996) meta-analysis provided  
7 opposing evidence, indicating that feedback had a negative effect in up to one  
8 third of interactions; and this was most likely to occur if the feedback was directed  
9 at higher levels, i.e. directed at self rather than task. On this latter concept, Hattie  
10 and Timperly(2007) also evolved this theme, describing of feedback  
11 conceptualising four levels (process, task, self-regulation and self) from which it  
12 can be considered, and that the targeted level influences the effectiveness.  
13 It should be emphasised that these earlier reviews focus on  
14 performance/academic achievement as outcome measures. The more recent  
15 literature shifts towards considering the post-feedback phase and the learner's  
16 experience. Much of the learner-focussed discussion has centred on  
17 motivational theory (Deci and Ryan, 2010) and how feedback can affect  
18 commitment and performance goals. Winstone's (2017) review has been novel in  
19 adding "proactive recipience" as a lens on feedback, a term she describes as the  
20 "state or activity of engaging actively with feedback processes, thus emphasizing  
21 the fundamental contribution and responsibility of the learner". In this, she  
22 proposes the SAGE (Self-appraisal, Assessment literacy, Goal-setting and self-  
23 regulation, and Engagement and motivation) taxonomy to describe a proactive  
24 recipient of feedback. This current BEME review aims to build on previous work  
25 by specifically using the lens of self-regulation to explore the internal processing  
26 changes that occur within the learner following feedback. It is anticipated that the  
27 resulting conceptual model will inform educators on practical approaches to  
28 harnessing feedback potential and optimise self-regulated learning. Thus, this  
29 review concerns not just how learners interact with feedback, but specifically  
30 how do they undertake this in the four phases of self-regulation  
31 (forethought/planning, monitoring, controlling, reacting) (Pintrich, 2002). Put more  
32 simply, what is known of how learners react to feedback and make metacognitive  
33 use of it?

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2 One of the challenges with this work is the heterogenous interpretation of the term  
3 “feedback”. There appears to be two distinctive shifts in representations of feedback  
4 over time. The first concerns a move from the transmission-based model which  
5 viewed feedback as “information created and transmitted by a teacher or supervisor  
6 to a learner, with the focus on the supervisor” to one that re-conceptualises the  
7 feedback event as an interactive dialogue between learner and rater (Delva, 2013;  
8 Teunissen, 2007). The second model is one which focusses on the content of the  
9 feedback message. Distinctive camps can be seen in the literature with regards to  
10 feedback content. The first considers feedback as any response to an observed or  
11 rated performance (Kluger and DeNisi, 1996), who also refer to feedback as  
12 “knowledge of results (KR)”. Feedback is characterised as any information related to  
13 a performance. This could comprise for example, correct answers in a multiple  
14 choice question examination, or an observation of a task, which is exemplified in this  
15 definition of feedback by Kulhavy (1977, p. 211) as "any of the numerous procedures  
16 that are used to tell a learner if an instructional response is right or wrong". This  
17 contrasts with the second camp of researchers who describe feedback as a more  
18 specific commentary on performance gaps compared to a standard. This group  
19 include Ramaprasad’s ubiquitously-cited definition of “information about the gap  
20 between the actual level and the reference level of a system parameter which is  
21 used to alter the gap in some way” (Ramaprasad 1983). If this second interpretation  
22 is accepted, it can be seen that the afore-mentioned examples would not be included  
23 in such a definition, since they only describe the performance rather than the gap.  
24 This stance models feedback in terms of Vygotskian theory; it is a potentiating tool in  
25 the zone of proximal development. Hattie and Timperly propose that it is “useful to  
26 consider a continuum between instruction and feedback”; such that this performance  
27 information is “specifically relating to the task or process of learning that fills a gap  
28 between what is understood and what is aimed to be understood”.

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2 Thus, two discrete representations of feedback delivery and format are proposed. A  
3 further framing of feedback, as a stimulus to effect a metacognitive processing is  
4 presented by Winne and Butler (1994): “feedback is information with which a learner  
5 can confirm, add to, overwrite, tune, or restructure information in memory, whether  
6 that information is domain knowledge, meta-cognitive knowledge, beliefs about self  
7 and tasks, or cognitive tactics and strategies”. Sadler (1989) also references the  
8 performance-standard gap but is notable for an emphasis on “appropriate action  
9 which leads to some closure of the gap”. Why the emphasis on this seemingly  
10 overlapping element? As Higgins et al (2001) point out, the process of identifying a  
11 deficiency/indicating the characteristics or components requiring remediation does  
12 not necessitate that the learner is armed with the strategies to effect these changes.  
13 This argument, in fact, draws together two aforementioned concepts. Firstly, the  
14 feedback format must be such that an action plan is created- that is, the learner is  
15 not merely provided with a summary of the performance and comments on what  
16 needs to be improved, but is given salient, specific and tangible ways to address the  
17 gap. Secondly, it can be seen that for this to happen in a meaningful way, the  
18 teacher must enter in to a dialogue with the learner to ensure clarity and shared  
19 planning.

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21 The existence of a diversity of interpretations of feedback goes some way towards  
22 explaining the complexity of this research space. Ramaprasad’s definition appears to  
23 be the most practical; however we remain cognisant of the potential need to unpack  
24 more precisely how this “information” is used to alter the gap, by incorporating  
25 Sadler’s reference to feedback being actionable. It is anticipated that studies which  
26 describe an interactive feedback event are more likely to address our question,  
27 rather than those which consider a purely transmissive delivery. However, it is  
28 considered excluding the alternative interpretations discussed above would make for  
29 an unrepresentative sampling. Much of the theoretical underpinning for feedback  
30 stems from psychology, where multiple theories such as Control Theory (Carver and  
31 Scheier 1981), Thorndike’s Law of Effect (1913) and Motivation Theory (Deci and  
32 Ryan) contributed to understanding. Most of this work has used experimental studies

1 and/or hypothetical modelling with feedback in the form of ratings or  
2 results(right/wrong). It was considered that narrowing our definition could risk  
3 omitting significant portion of the literature and type of study that is necessary to  
4 inform if *format* and *type* of feedback have a bearing on our research question. For  
5 the purposes of this work, a broad view of feedback definitions and formats will be  
6 included, to ensure that the literature captured is a true reflection of the landscape.

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1 Translation to Practice

2 Through the development of a BEME Scoping Review, we are aiming to explore the  
3 peri and post-feedback episode from the learner's perspective. There is a wealth of  
4 evidence on the role of feedback in affecting performance (both positively and  
5 negatively). This review seeks to focus the lens not on the performance as an  
6 outcome, but on the learner's process in employing feedback for their learning  
7 benefit. It is expected that a number of themes will emerge on how feedback affects  
8 learners. From the initial search, as detailed below, a number of heterogeneous  
9 issues have thus far arisen: from affective responses and effects on self-esteem and  
10 confidence, to reports of succinct changes in learning and/or work practice. By using  
11 the lens of self-regulation learning theory, it is anticipated that responses can be  
12 categorised at each phase which will allow educators to consider how feedback may  
13 be targeted towards particular areas for specific learner needs. It is expected that  
14 quantifying these learner responses within the literature and developing a conceptual  
15 framework in which to situate the learner journey with feedback will provide,  
16 educators, and policy makers with a greater insight in to how to make feedback  
17 effective for learners, from a learner-centred standpoint.

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2 The first step was an initial search of Medline, Embase, CINAHL, WebOfScience,  
3 PsychINFO and Scopus. These searches identified 2517 records, using keywords  
4 “education”, “learning”, and “students”. “feedback” and “assessments”. Three  
5 members of the team (MS/TP/CD) then undertook an analysis of the text words in  
6 the abstracts and titles of these retrieved articles. In this pilot search, 100 papers for  
7 which abstracts were reviewed, of which 11 met the full inclusion and exclusion  
8 criteria for full review. A second search will be undertaken using all the identified  
9 keywords and index terms across all databases chosen.

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## 2. Review question(s), objectives and key words

The objective of this scoping review initially was to examine and map what is currently known regarding use of and response to feedback, in the context of self-regulatory learning theory. As such, the following research question for scoping review(s) is proposed, in the context of health professions education:

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- i. How do learners use and respond to feedback for learning gains?

Key words: Feedback, feedback recipience, feedback acceptance, feedback response

### 1.5 Objectives

- To map what is currently known about learner response to and use of feedback for learning.
- To focus the feedback lens on the learner’s process (as opposed to outcomes) in employing feedback for their learning benefit.
- To explore the themes which emerge on how feedback affects learners, using self-regulatory theory as the underpinning to categorise responses at each phase
- To develop a conceptual framework in which to situate the learner journey with feedback to provide, educators, and policy makers with a greater insight in to how to

## 3. Search sources and strategies

A three-step search strategy is to be utilised, as is recommended when using Joanna Briggs Institute (JBI) scoping methodology (Peters et al, 2017). The first step was an initial limited search of at least two online databases relevant to the

1 topic, as mentioned above. Following this, analysis of the text words contained in the  
2 title and abstract of retrieved papers, and of the index terms used to describe the  
3 articles, was undertaken. This led to the identification of keywords and index terms  
4 that will be searched across all databases. The following databases will be searched:  
5 Medline, Embase, CINAHL, Web of Science, PsychINFO and Scopus. Citation  
6 searching will also be performed. Two independent reviewers using a consensus  
7 approach will perform screening, data extraction and analysis procedures. Where  
8 this is difficult to achieve, a third arbitrator will make the final decision. Thirdly, the  
9 reference list of all identified reports and articles will be searched for additional  
10 studies. It is planned to contact authors of primary studies or reviews for any  
11 publications which are deemed relevant. This may include publications where full-  
12 texts cannot be accessed, or those where there is a report in metacognitive  
13 response or use of feedback without presenting evidence in support of this, so  
14 further details will be requested. The search has not been time-limited as the initial  
15 search identified a sample which is feasible to review without same.

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4. Study selection criteria

Only those reports that describe a report on the learner’s interaction with feedback will be included. As aforementioned, only studies which define feedback (either explicitly or implicitly) in a way which addresses learner performance-standard gap will be included. Only studies in the English language will be included. Studies which meet this definition and describe feedback additionally in terms of any of the following will be included:

Inclusion Criteria	Exclusion Criteria
<p>Feedback provided from patients/teachers/examiners/employers/supervisors/peers at undergraduate, postgraduate and continuing education levels</p> <p>Feedback in any communication form, e.g. verbal, written, online, etc.</p> <p>Feedback on any type/format of performance</p> <p>Feedback as meets any of the commonly proffered definitions, i.e. information on a performance which could take the form of any one or combination of knowledge of results (e.g. numerical ratings) and/or observation with correction/instruction (narrative feedback)</p> <p>AND</p> <p>Reports on the learner’s interaction with the feedback</p> <p>Reports that feedback is used by learners/how it is used by learners</p> <p>OR</p> <p>Reviews that report how feedback is used or what</p>	<p>Feedback to staff/employers</p> <p>Feedback on learning environment</p> <p>Feedback to learners at primary or second-level</p> <p>Self-assessment as feedback</p> <p>OR</p> <p>Haptic/visual outputs as feedback</p> <p>Editorials/commentaries</p> <p>OR</p> <p>Response to feedback which could not be considered directly attributable to feedback, E.G. an intervention where the feedback</p>

learning gains occur in response to feedback	cannot be disentangled from a teaching and/or assessment intervention  OR Perception/evaluation of feedback reported as response to feedback
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1 Concept

2 Only studies which meet the chosen definition of feedback will be included. In terms  
3 of exclusion criteria, studies which characterise feedback as a description of a  
4 performance without identifying and addressing deficiencies will not be included.  
5 This means studies which term haptic, visual and automated response system  
6 outputs as feedback will be excluded.

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8 Context

9 Feedback is being explored in terms of how it affects the learner meta-cognitively.  
10 The focus is on a learner-centred experience of feedback and mapping the  
11 landscape of the literature in terms of how learners seek and respond to feedback.

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13 Types of sources

14 No restrictions for study design will be applied; mixed methods, qualitative and  
15 quantitative studies will be included. The context for this study includes original  
16 research and systematic reviews relating to feedback to learners. Publications  
17 including commentaries, letters and editorials will not be included in the review

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3 Procedure for extracting data

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5 Using a BEME coding sheet modified to suit specific review focus, two study authors  
6 (MS and CD) will independently extract data from all relevant studies. Prior to full  
7 data charting, the two authors will engage in an initial pilot process of utilisation and  
8 adjustments to the charting table may be necessary at this point. Both authors will  
9 then undertake a process of orientation to the tool *a priori* to full extraction to ensure  
10 inter-rater reliability to a kappa of at least 0.80 agreement. Conflicts will be resolved  
11 as needed and a third assessor will be consulted to assess validity/accuracy of  
12 responses as needed

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16 Data charting/extraction will be conducted using a structured data capture Excel  
17 template with the following headings:

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1. Author

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2. Publication date

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3. Journal Name

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4. Setting (Country)

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5. Participants/Target Group (e.g., undergraduate, postgraduate,  
23 continuing professional development/medical education)

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6. Literature type

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7. Feedback definition

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8. Feedback format

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9. Feedback delivery

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10. Learner response/learning gain identified

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## 5. Synthesis of extracted evidence

The data will be analysed in keeping with the question presented, using standard techniques including inductive coding and theoretical saturation. Coding inconsistencies will be addressed by team discussion until consensus is reached. Descriptive statistics will be generated. A quality appraisal is not routinely performed for this type of review and therefore will not be considered here, which aligns with published frameworks for scoping reviews (Peters et al, 2017). Based on our literature review to date, a lack of homogeneity in characterisation of feedback may mean it will require multiple categories for study analysis and therefore make meta-analysis challenging. It is considered that meta-synthesis may prove useful to explore and concepts and themes arising from qualitative studies. Since its purpose is to outline the landscape in relation to the objectives of the review, it is anticipated that results will be presented in diagrammatic format along with a proposed explanatory summary. This plan will be refined at a later stage in the study when there is a greater insight to the nature of our results. Any amendments to the approach will be recorded temporally, with a rationale for same.

6. Project timetable

	02/' 19	03/' 19	04/' 19	05/' 19	06/' 19	07/' 19	08/' 19	09/' 19	10/' 19	11/' 19	12/' 19	01/' 20	02/' 20	03/' 20	04/' 20	05/' 20	06/' 20	07/' 20	08/' 20
Discussion of team roles and defining the project																			
Working with research librarian on search strategy																			
Full search of literature																			
Finalize topic registration and submission to BEME																			
Primary screening of																			

How do learners respond to and use feedback? A BEME Scoping Review

~3500 records + consensus decisions																		
Develop and submit BEME Protocol																		
Secondary (full-text) screening ~400 records																		
Data charting/extract ion																		
Synthesise data																		
Write the review																		
Submit Study																		

7. Conflict of interest statement

All authors report no conflicts of interest whether academic, institutional, political, financial, personal, or other.

8. Plans for updating the review

It is anticipated that the review will be completed within two years of the initial search. If this deadline is not met, for any reason, the research librarian will re-run the search strategy in the month prior to completion of the write-up.

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Appendix A

Pubmed search strategy

<b>PubMed Medline</b> No limits		
<b>1</b>	<p>(education[Title/Abstract] OR educational[Title/Abstract] OR learning[Title/Abstract] OR "Learning"[Mesh] OR "Social Learning"[Mesh] OR "Education, Professional"[Mesh] OR "Education, Pharmacy, Graduate"[Mesh] OR "Education, Pharmacy"[Mesh] OR "Education, Nursing, Graduate"[Mesh] OR "Education, Nursing, Diploma Programs"[Mesh] OR "Education, Nursing, Continuing"[Mesh] OR "Education, Nursing, Baccalaureate"[Mesh] OR "Education, Nursing, Associate"[Mesh] OR "Education, Nursing"[Mesh] OR "Education, Medical, Undergraduate"[Mesh] OR "Education, Medical, Graduate"[Mesh] OR "Education, Medical, Continuing"[Mesh] OR "Education, Medical"[Mesh] OR "Education, Graduate"[Mesh] OR "Education, Dental, Graduate"[Mesh] OR "Education, Dental, Continuing"[Mesh] OR "Education, Dental"[Mesh] OR "Educational Measurement"[Mesh])</p>	<b>1,150,488</b>
<b>2</b>	<p>((student[Title/Abstract] or students[Title/Abstract]) AND (medical[Title/Abstract] OR medicine[Title/Abstract] OR nursing[Title/Abstract] OR midwifery[Title/Abstract] OR midwives[Title/Abstract] OR pharmacy[Title/Abstract] OR pharmacist[Title/Abstract] OR physiotherapist[Title/Abstract] OR physiotherapists[Title/Abstract] OR dentist[Title/Abstract] OR dentists[Title/Abstract] OR veterinary[Title/Abstract] OR dental[Title/Abstract] OR "Students, Premedical"[Mesh] OR "Students,</p>	<b>365,776</b>

	Pharmacy"[Mesh] OR "Students, Nursing"[Mesh] OR "Students, Medical"[Mesh] OR "Students, Health Occupations"[Mesh] OR "Students, Dental"[Mesh])	
<b>3</b> <b>FEEDBACK</b>	(feedback[Title/Abstract] OR Feedback[Mesh] OR Formative Feedback[Mesh])	<b>129,414</b>
<b>4</b> <b>ASSESSMENT</b>	Search (Assessment[Title/Abstract] OR assessments[Title/Abstract])	<b>892,850</b>
<b>5</b>	<b>1 AND 2 AND 3 AND 4</b>	<b>1,660</b>