Window to the Unknown: Using Storytelling to Identify Learning Needs for the Intrinsic Competencies Within an Online Needs Assessment

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ABSTRACT

Introduction: Needs assessments are important for developing online educational resources, but they frequently do not capture learning needs in the intrinsic physician competencies. Storytelling exercises, by promoting critical reflection and emphasizing values and context, may assist curriculum developers in identifying emergent knowledge gaps in these areas that are initially unknown to learners.

Methods: We developed an online curriculum for thrombosis and hemostasis based on an open-access online needs assessment comprised of a topic list, case scenarios, and storytelling exercise. In the storytelling exercise, learners described 1) a difficult clinical case and 2) *why* that case was difficult. In this qualitative descriptive study, we performed a secondary thematic analysis of this storytelling data, coded for the CanMEDS 2015 intrinsic roles. Two investigators independently coded transcripts with iterative comparison.

Results: A total of 143 respondents completed the storytelling exercise. All responses yielded a gap in medical expertise, while 25 (17.5%) described an additional intrinsic role. Learning needs in all six intrinsic roles were identified. The most commonly cited learning needs were in the leader (recognizing how resource allocation impacts health care), communicator (communicating knowledge with patients), and collaborator (unclear communication between providers) roles. These excerpts were notable for how they expressed the complexity and affective components of medicine.

Conclusions: Storytelling exercises can highlight context, attitudes, and relationships that provide depth to needs assessments. These narratives are a novel method of identifying gaps in intrinsic physician competencies

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that are initially unknown by learners (Johari window). These emergent intrinsic learning needs may be used to enrich learner-centered curricula.

The needs assessment is an important first step in planning educational programs for health professions education. In designing needs assessments to address gaps in knowledge, skills, or attitudes, it may be helpful to conceive of learning needs as being either *known* (or apparent) to learner and teacher or *unknown* (gaps that are not immediately apparent to learner and/or teacher).¹

The interplay between these known and unknown gaps is illustrated by Johari’s window, a 2 × 2 taxonomy that displays what is known and unknown to the learner and/or teacher (Figure 1).² Different needs assessment methods may address learning gaps by touching upon separate aspects of this taxonomy. For example, *open* needs (known to both learner and teacher) may be ascertained through focus groups, surveys, and interviews that establish what learners desire to learn.³ By contrast, audits and knowledge tests may aid in determining deficiencies that are not immediately apparent to learners (but may be suspected as deficiencies by teachers).⁴

Learning needs that are unknown to both learner and teacher may be the most challenging to ascertain. Identifying these gaps, which Luft and Ingham⁴ would classify as “unknown” needs within the Johari window, often requires feedback from patients or multisource feedback which may be impractical to obtain. This challenge becomes exacerbated when attempting to identify gaps in the nonmedical expert, or “intrinsic,” physician competencies. These intrinsic competencies are highlighted in several physician competency frameworks, including CanMEDS 2015 (collaborator, leader, scholar, communicator, health advocate, professional) and the Accreditation Council for Graduate Medical

Education (ACGME) Core Competencies (practice-based learning and improvement, systems-based practice, interpersonal and communication skills, professionalism).^{5,6} Strategies to determine intrinsic needs have included focus groups, questionnaires, and standardized patient encounters.^{7–9} However, these methods may be inefficient, challenging to implement, and seldom detect gaps that are not already known to learner and teacher. How then can we more efficiently and effectively discern the unknown intrinsic role needs of practicing clinicians?

A possible answer may lie in the use of storytelling exercises. Storytelling within medical education may impact learners by enabling the exploration of complexity, uncertainty, and doubt. Through the recounting of stories, the immediate, specific, and practical challenges presented in clinical experiences may help to emphasize the importance of attitudes and values within medicine.^{10–13} Through their rich descriptions of narrative, storytellers may undergo a process of critical reflection on their professional roles, which commonly involve physician competencies within nonexpert domains.

A recent report from our group described the utility of a storytelling exercise as a novel method of ascertaining learning needs, within a so-called “Massive Online Needs Assessment (MONA).”¹⁴ In this study we present the findings from a preplanned qualitative secondary analysis of data from these exercises within the MONA. Herein, we hypothesized that the use of storytelling exercises would enable the declaration of learning needs in the intrinsic competencies that are unknown to both learners and teachers. These findings were used to inform the development of a learner-centered

	Known to self (learner)	Unknown to self (learner)
Known to others (teacher)	OPEN <ul style="list-style-type: none">• Focus groups• Surveys• Interviews	BLIND <ul style="list-style-type: none">• Audits• Key informants• Knowledge tests
Unknown to others (teacher)	HIDDEN <ul style="list-style-type: none">• Audits• Key informants• Knowledge tests	UNKNOWN <ul style="list-style-type: none">• Multisource feedback• Patient feedback

Figure 1. The Johari window. The original Johari window of Luft and Ingham,⁴ with its application to differing needs assessment modalities.

curriculum incorporating learning needs in the intrinsic competencies.

METHODS

Study Design

This was a qualitative interpretive description study in which we performed a thematic analysis of data collected from within a MONA to create an online curriculum in thrombosis and hemostasis. Interpretive description, which springs from nursing and other applied disciplines, is a type of generic qualitative method that examines any text (in this case stories generated within a needs assessment survey), hoping to discover themes that might emerge during an analysis.¹⁵ The complete methods for the MONA has been previously described in our initial study¹⁴ but is summarized here.

The needs assessment was embedded as an online survey within a blog post on CanadiEM.org, a self-identified Free Open Access Medicine (FOAM)-aligned website. It consisted of three parts that were completed in one sitting: a topic list (and opportunity to free-text self-identified learning needs), case scenarios with multiple-choice questions, and a storytelling exercise (see Table 1). For the storytelling exercise there was no word limitation, and responses were collected in English and Spanish.

Study Participants and Data Collection

The survey was created as a Google form (Mountain-view, CA), and responses were entered directly by participants online. The MONA was left open from

September 20 to December 10, 2016, and took approximately 30 minutes to complete. The study team recruited participants on social media via a separate CanadiEM blog post, Twitter, and Facebook. Enrollment was open to all health care providers who were practicing or in training, including physicians and nonphysicians. As such this was a convenience sample composed of providers with varying experience levels.

Data Analysis

Free-text data from the storytelling exercise was extracted. Content analysis of open-ended text responses was performed in an iterative fashion informed by fundamental qualitative description and coded for intrinsic competencies found within the CanMEDS 2015 competency framework.⁵ CanMEDS was chosen as the coding framework, instead of the ACGME Core Competencies, as it is well established within Canadian medical education, and a significant proportion (35%) of the CanadiEM readership is Canadian. Using an established framework such as CanMEDS would also facilitate curriculum development based upon the results of this secondary qualitative analysis. This data-driven, low-inference approach was chosen to identify and describe emergent themes present in the textual responses.

Two investigators (ET, DJ) read and independently coded each transcript and then compared codes to resolve discrepancies and reach consensus for themes in the coding framework. Written notes from each reviewer were also analyzed for additional themes. Cases of discrepant coding were resolved by a third

Table 1
Phases of MONA

Phase	Description	Application to Johari Window
1. Online survey of topics	A list of possible topics as learning needs was generated by content-area experts. Participants were provided this list in an online survey and asked to identify which topics they considered to be learning needs. They were also asked to list any additional topics they identified as learning needs, as free text.	<i>Learner:</i> Known <i>Faculty:</i> Known (list of topics) and unknown (free text topics)
2. Case scenarios followed by multiple choice questions	Participants were presented with five online case scenarios, with a case vignette followed by three multiple choice questions. Questions were developed by content-area experts.	<i>Learner:</i> Unknown <i>Faculty:</i> Known (questions developed to identify unperceived needs)
3. Storytelling exercise	In free text, participants were asked to describe difficult cases they had encountered involving derangements in bleeding and/or clotting. They were asked two questions: “Please describe a difficult scenario you had due to clotting or bleeding, or where you had a patient with a blood disorder. Please do not put confidential information such as name or location. Keep your story generic.” “Please tell us <i>why</i> the scenario was difficult for you.”	<i>Learner:</i> Unknown <i>Faculty:</i> Unknown

MONA = Massive Online Needs Assessment.

Table 2
Participant Characteristics

Characteristic	All MONA Respondents (n = 198)	Intrinsic Storytelling Respondents (n = 25)
Health care profession		
Practicing physician	109 (55.1)	16 (64.0)
Resident physician	46 (23.2)	2 (8.0)
Medical student	29 (14.6)	3 (12.0)
Registered nurse	8 (4.0)	2 (8.0)
Paramedic	4 (2.0)	0 (0.0)
Physician assistant	1 (0.5)	1 (4.0)
Pharmacist	1 (0.5)	1 (4.0)
Sex		
Male	113 (57.1)	13 (52.0)
Female	85 (42.9)	12 (48.0)
Country		
Canada	115 (58.1)	11 (44.0)
United States	51 (25.8)	8 (32.0)
Other (19 countries)	32 (16.2)	6 (24.0)
Area of practice		
Emergency medicine	118 (59.6)	21 (84.0)
Internal medicine	41 (20.1)	1 (4.0)
Primary care	14 (7.1)	0 (0.0)
Surgical specialty	9 (4.5)	0 (0.0)
Critical care	7 (3.5)	1 (4.0)
Anesthesiology	2 (1.0)	1 (4.0)
Other	7 (3.5)	1 (4.0)
Practice setting		
Hospital-based	144 (72.7)	19 (76.0)
Community-based	39 (19.7)	6 (24.0)
Other	6 (3.0)	0 (0.0)

Data are reported as n (%).

reviewer with experience in qualitative research methodology (TC). Techniques to ensure analytic rigor included the use of written notes and the incorporation of differing perspectives in the analytic team, as the group included a medical student (DJ), clinical fellow (ET), and attending physician (TC) from different medical specialties (hematology, emergency medicine).

Ethics

This study received approval from our institutional review board (Hamilton Integrated Research Ethics Board, File 2016-1954-GRA).

RESULTS

A summary of MONA participant characteristics can be found in Table 2. Most respondents were training or practicing physicians from North America. Most participants were hospital-based physicians in emergency

medicine or internal medicine, which reflects the readership of CanadiEM.org.

A total of 198 participants provided responses to any phase of the needs assessment, of whom 143 (72.2%) completed the storytelling exercise. All storytelling responses yielded a medical expert need, while 25 (17.5%) described at least one additional nonexpert learning need (Figure 2). The most commonly cited intrinsic roles were collaborator (8/25 responses, 32.0%) and leader (8/25, 32.0%), followed by scholar (4/25, 16.0%), communicator (3/25, 12.0%), advocate (3/25, 12.0%), and professional (1/25, 4.0%). Participants whose storytelling responses described an intrinsic learning need were primarily from emergency medicine (21/25, 84.0%), along with one individual in each of internal medicine, critical care, anesthesia, and obstetrics. Among the responses describing an intrinsic competency, nine of 25 (36.0%) were physicians practicing at least 5 years, seven of 25 (28.0%) were physicians practicing less than 5 years, five of 25 (20.0%) were medical students or residents, and four of 25 (16.0%) were interdisciplinary (registered nurse, pharmacist, physician assistant).

Themes relating to the intrinsic competencies were reflected in the intrinsic roles of the CanMEDS 2015 competency framework (Table 3). Excerpts were notable for how they exhibited the complexity of clinical medicine, with their affective components making them memorable and difficult for both training and practicing providers.

Responses Reflecting Collaborator Role

The ability of health care professionals to communicate and work together effectively to provide patient-centered care⁵ was frequently cited. Stories often situated the learner as caught in the middle between consultants or colleagues who were failing to communicate with each other, leaving the learner as primary physician in an uncertain position. This reflects our participant demographics as most were in primary care or generalist specialties.

Story: Large subdural [hematoma] on warfarin for metallic valve. INR high. Cardio [says] ask Neuro, Neuro [says] ask Cardio, both say ask Heme, Heme [says] ask Neuro and Cardio!

WHY difficult: Balancing risk [of] thrombosis with intracranial bleeding risk

Role	Participants (n = 25)																								
Medical Expert																									
Collaborator																									
Leader																									
Scholar																									
Communicator																									
Advocate																									
Professional																									

Figure 2. Distribution of intrinsic physician roles in storytelling responses. Each of the 25 respondents cited the medical expert role plus at least one additional intrinsic role. Each column represents one respondent, with gray boxes representing the roles cited.

Table 3
Coding Framework Derived From Thematic Analysis of Storytelling Data

Intrinsic Role (No. of Responses)	Themes Identified
Collaborator (8)	<ul style="list-style-type: none"> Poor or unclear communication between health care providers Engage in group decision making with physicians and other colleagues in the health care professions Lack of consensus from physician groups about how to manage specific scenarios Difficulty educating colleagues respectfully in a clinical environment
Leader (8)	<ul style="list-style-type: none"> Recognizing how allocation of health care resources might impact patient care
Scholar (4)	<ul style="list-style-type: none"> Ability to find appropriate information resources Difficulty evaluating and integrating evidence-based medicine into clinical decisions Identify opportunities for learning and improvement by regularly reflecting on and assessing their performance
Communicator (3)	<ul style="list-style-type: none"> Difficulty communicating expert knowledge with patients
Health advocate (3)	<ul style="list-style-type: none"> Working with patients through obstacles restricting their access to healthcare Advocating for the mobilization of resources to benefit patients
Professional (1)	Recognizing the importance of patient autonomy in clinical decision making

This story demonstrates frustration and lack of clarity on the part of the learner, who is not receiving advice regarding management as multiple specialists do not collaborate effectively. While the story clearly reflects a medical expert need, it also speaks to workplace complexity and the ability to navigate between providers. It suggests that a curriculum focused on interprofessional collaboration and communication would be of particular benefit.

A similar theme reflecting a lack of shared knowledge and perspective between providers was also reflected by learners at the systems level. Here, a lack of prior consensus between physician groups resulted in difficult decision making at the bedside:

Story: Young guy, 20 [years old], with sickle cell disease used to get blood transfusions by the pediatric ward; now his hematologist says he can't. Now comes in with sickle cell pain crisis, [hemoglobin] 70 g/L. Transfuse or not?

WHY difficult: Because [of] the completely different approach[es] of our pediatricians compared to our [adult] hematologists.

In this excerpt the learner has not consulted a specialist yet but is drawing on prior experience to highlight the lack of agreement between physicians. The learner suggests that a more unified collaborative approach would provide clarity.

Responses Reflecting Leader Role

Several respondents highlighted how resource limitations affected their ability to provide optimal care. Their case descriptions suggested that they knew from a medical expert perspective what the appropriate management should have been; the difficulty was in the allocation and availability of resources in their setting.

Story: Patient with massive GI hemorrhage from esophageal varices. He vomited at least a liter of bloody emesis. Besides liver disease he was also on [rivaroxaban].

WHY difficult: I was at a community affiliate site with limited resources. No GI availability and had to stabilize prior to transfer ... [I] had to administer various agents to reverse liver-associated coagulopathy and [rivaroxaban].

While recognition of resource limitation is a first step in developing a high-quality system, there are many downstream skills that are needed to enact change to improve the quality and patient safety. These leader competencies—applying the science of quality improvement, resource stewardship, and team leadership—were not reflected in the responses received, possibly due to how the questions were framed. However, given that multiple respondents cited resource limitation as a primary challenge, this theme suggested that strategies for navigating resource constraints were worth exploring in the online curriculum.

Responses Reflecting Scholar Role

Health care professionals are expected to practice lifelong learning through continuing education, teaching, evaluation of evidence, and scholarly contributions.¹⁶ These components of the scholar role encompass skills that are often learned outside of the clinical setting. However, the stories were indicative of how the need for skills in seeking and evaluating evidence may have implications at the bedside. The example below illustrates the challenges of integrating an evidence-based approach to the uncertainty of clinical medicine:

Story: DVT vs. cellulitis—unclear if application of Wells DVT criteria was correct—preceptor ignored Wells score as it just “didn’t quite look like a DVT.” Goes on to ultrasound leg anyway, [and] we [treated] for cellulitis.

WHY difficult: Even with easy access to Wells DVT criteria on MedCalc, it is difficult to know if application of rule is correct. For instance, I think more teaching is needed as to what “localized tenderness along deep venous system” is . . . I’d also like more help learning about how this rule helps us clinically, the population it was studied in, and what to do when your patient doesn’t fit the study population.

Other participants similarly described scenarios in which there was uncertainty and cited aspects of the scholar role that would help them address their clinical queries. This included comments about strategies for obtaining reliable information for uncommon conditions and descriptions of how reflecting on such experiences led to self-improvement.

Responses Reflecting Communicator Role

The ability to communicate effectively with patients is a key physician competency. Effective communication skills encompass a suite of abilities including effective listening, eliciting information, patient counseling, and making informed decisions based on patient preferences.¹⁷ Respondents who cited the communicator role focused primarily on the challenges of providing information using effective explanatory skills. This was relevant as the scenarios described exhibited competing risks of thrombosis and bleeding.

Story: I find it difficult to truly communicate what the risk of bleeding is versus the risk of clotting, even with risk scores, in a way that patients understand, for things like stroke or [pulmonary embolism].

WHY difficult: Risks and benefits of both bleeding and clotting are real but small in a lot of cases (for example, stroke with [atrial fibrillation]), and I find patients don’t pay much attention to small numbers.

This passage is striking in that the storyteller has chosen to discuss a theme of difficulty in communication skills that applies across many patients for a common clinical scenario. It suggests that a curriculum addressing this topic would be enriched by describing practical strategies for patient-centered communication.

Responses Reflecting Health Advocate Role

Physicians as health advocates contribute their expertise and leverage their position to support patients in improving their health. Advocacy may involve recognizing and responding to the needs of either individual patients or their broader communities. A few trainees acknowledged that determinants of health were key factors that impacted access to health care, adding complexity to the patient interaction.

Story: Young female patient with new [deep vein thrombosis], no prior, unprovoked [event]. No insurance or coverage for medications.

WHY difficult: Had difficulty with choice of anticoagulant, given cost and

accessibility restraints, and also difficulty providing information to patient regarding 'best' choice considering long duration of therapy.

In this passage, the respondent has identified an obstacle that would greatly impact therapeutic options. In an otherwise straightforward scenario, the difficulty was driven not by a knowledge gap but by socioeconomic barriers. This suggests that a learner-centered curriculum would potentially reflect how experienced providers advocate for patients in these settings.

DISCUSSION

Determining learning needs provides the foundation for planning continuing education for learner-centered curricula.¹⁸ Creating an online curriculum is challenged by the heterogeneity of practice context and experience of prospective learners. In this setting, structured needs assessments may engage a community of online learners by ascertaining their perceived knowledge gaps.¹⁹ Our needs assessment has extended this by employing a storytelling exercise to determine topics that are unknown by both curriculum developers and learners in the intrinsic CanMEDS competencies.

The key finding from this study was the emergence of learning needs in the intrinsic competencies—gaps that were largely unknown to learners, but our needs assessment was able to prompt these needs via critical reflection in a storytelling exercise (Figure 1). These topics reflected all the nonexpert CanMEDS competencies; furthermore, while the ACGME Core Competencies were not explicitly used as an organizing framework for our analysis, the ACGME nonexpert competencies of practice-based learning and improvement, systems-based practice, interpersonal and communication skills, and professionalism would also be reflected in the data and excerpts presented in this article. As such, it is possible that the methods used in this needs assessment would be applicable to learners in non-CanMEDS medical education programs, including those under the purview of ACGME.

These topics were frequently described in stories that had memorable affective components. Medical learners develop narratives as a scaffold for describing "diagnostic stories" about patients to explain their presentation.²⁰ If patients' clinical courses are conceived as narratives, it is unsurprising that the eliciting of stories would uncover details that reflect the complexity

of clinical care, which is often not driven solely by deficiencies in expert competencies. Within the Johari window, these narratives may exist in a "storytelling-sensitive zone" that, when elicited through this exercise, may push intrinsic learning needs from the unknown quadrant to the blind quadrant, whereby the teacher may ascertain additional learning needs (Figure 1). We feel the Johari window is a useful framework to consider as we continue to conduct needs assessments for continuing education, as many beyond-residency curricula tend to emphasize only medical expertise.²

The additional curricular topics yielded in this study may reflect the utility of mixed methods to identify learning needs unknown to both learner and instructor in the Johari window. Relying on self-assessment for identifying learning needs may be unreliable as learners often have difficulty assessing their own performance.²¹ There have been few studies with high-quality comparisons of self-assessed needs against valid assessments of learning needs.²² The use of mixed methods for needs assessment has also been employed by Amery et al.²³ These authors identified different learning needs among hospice physicians when answers on a questionnaire were compared with interview responses based on incidents recorded in an educational diary; the diaries/interviews revealed intrinsic learning needs related to communication, teamwork, and personal coping strategies. Our study was similar in identifying different learning needs by using a strategy that promoted self-reflection. Ample literature has suggested that learners in the medical education context lack the ability to self-assess adequately.^{24–27} Our hope is that by incorporating elements of storytelling elements in needs assessments we can prompt learners in this space to reveal to continuing professional development providers their more hidden needs.

The most commonly described intrinsic competencies in this small sample were the collaborator and leader roles. Within the collaborator role, learners primarily expressed challenges in communicating with other physicians and health care providers in complex scenarios. Meanwhile, in the leader role the focus was on strategies for delivering care in resource-limited settings. These responses may have reflected the complexity of the cases presented in which collaborative decision-making or specialist-level resources would be warranted, with overlap between different intrinsic roles. Although it is unclear whether the use of a storytelling exercise in another context would yield a

similar distribution of learning needs, the main utility of this exercise was to identify learning topics.

It is notable that the storytelling exercise yielded expert and nonexpert learning needs expressed by both practicing and training providers. The FOAM movement provides an avenue for continuing education but is primarily focused on providing expert content. This is consistent with surveys of practicing providers; for example, a study of practicing academic emergency medicine physicians described a strong preference for expert continuing education content.²⁸ The identification of intrinsic learning needs in this study demonstrates the utility of a storytelling exercise to identify a spectrum of needs from a heterogeneous group of learners that can be addressed in future educational programs. Harnessing the power of these questions in a more homogenous or local groups may prove to be even more powerful than what has been shown in this study—since local participants may be more readily able to use stories to highlight idiosyncratic needs at their own institution (e.g., need for joint conflict resolution workshops with one specific consultant group, if recurrent difficulties occur within that field).

The Johari window is a conceptual framework that can help others to explore new ways of making the hidden, blind, and unknown aspects of our learners' needs more apparent to us for the purpose of planning new continuing education resources. For our own purposes, we have harnessed the power of our needs assessment mentioned in this paper to develop goals and objectives for a curriculum we are publishing via the online CanadiEM blog.²⁹ This new series (entitled “Blood & Clots”) harnesses the power of blog posts, infographics, and podcasts to deliver content derived from this phase of our needs assessment (<https://canadiem.org/bloodandclots>). Specifically, the podcast (titled the “Thrombophonia”) takes the stories we have gathered to create clinical vignettes that serve as the entry point for a deep dive into difficult scenarios.

LIMITATIONS

One limitation in this study was the small group of learners sampled. While we did not reach theoretical saturation of the themes identified owing to the study methodology, there was substantial repetition of themes that would be integrated and triangulated with other data from the MONA. It is also notable that

only 25 of 143 (17.5%) of storytelling respondents cited an intrinsic competency. It is unclear whether these proportions would have been reflected in a larger sample and whether the types of intrinsic roles cited would differ.

Another limitation was the lack of a control group as all potential respondents were asked to complete all parts of the MONA, including the storytelling exercise. While this may limit our ability to determine if learners, in their storytelling, were merely stating an already-perceived need (compared with an unknown need), none of the learners volunteered an intrinsic learning need when provided with the opportunity to list, by free text, any additional learning topics in the first portion of the MONA (Table 1). This may suggest that storytelling indeed prompted the uncovering of learning needs that were not explicitly expressed or apparent to learners before the MONA. In future studies one would consider asking learners specifically if they perceived any learning needs specifically in the nonexpert competencies.

Another limitation was the lack of a “criterion standard” by which to compare needs gleaned from the storytelling exercise. For practical reasons it would be challenging to ascertain whether, for example, a learner identifying a collaborator issue in a thrombosis scenario had broader difficulties with collaboration in practice. Given the learner-centered aims of this resource, such triangulation would be of limited value as the developed intervention would still be likely to benefit other learners. A third limitation was the brevity of reflection in this exercise. While other publications have allowed for longer pieces to promote critical reflection, a shorter exercise in our MONA enabled focused identification of key issues.³⁰ It is also possible that a greater length or depth of answers would be provided if the needs assessment were performed in person, but this would not be amenable to widespread distribution online as part of the MONA. Our initial framework of intrinsic needs could be used to develop a more comprehensive questionnaire or interview guide to inform further learning needs.

CONCLUSION

Requests for storytelling can highlight the context, attitude, and relationships present in the complexity of medicine. The eliciting of such narratives may capture new learning needs in the intrinsic competencies that are unknown to both faculty and learners. These

intrinsic learning needs may ultimately be used to enrich learner-centered curricula.

References

1. Aherne M, Lamble W, Davis P. Continuing medical education, needs assessment, and program development: theoretical constructs. *J Contin Educ Health Prof* 2001;21:6–14.
2. Luft J, Ingham H. The Johari window: a graphic model of interpersonal awareness—Proceedings of the Western training laboratory in group development. Los Angeles Univ Calif. 1955.
3. Taylor DC, Hamdy H. Adult learning theories: implications for learning and teaching in medical education: AMEE Guide No. 83. *Med Teach* 2013;35:e1561–72.
4. McKimm J, Swanwick T. Assessing learning needs. *Br J Hosp Med* 2009;70:348–51.
5. Frank JR, Snell L, Sherbino J, editors. *CanMEDS 2015 Physician Competency Framework*. Ottawa: Royal College of Physicians and Surgeons of Canada, 2015.
6. Swing SR. The ACGME Outcome Project: retrospective and prospective. *Med Teach* 2007;29:648–54.
7. Davis P, Man P, Cave A, McBennett S, Cook D. Use of focus groups to assess the educational needs of the primary care physician for the management of asthma. *Med Educ* 2000;34:987–93.
8. Davis P, Russell AS, Skeith KJ. The use of standardized patients in the performance of a needs assessment and development of a CME intervention in rheumatology for primary care physicians. *J Rheumatol* 1997;24:1995–9.
9. Davis P, Suarez-Almazor M. An assessment of the needs of family physicians for a rheumatology Continuing Medical Educational program: results of a pilot project. *J Rheumatol* 1995;22:1762–5.
10. Greenhalgh T. Storytelling should be targeted where it is known to have greatest added value. *Med Educ* 2001;35:818–9.
11. Hensel WA, Rasco TL. Hensel storytelling as method of teaching values and attitudes. *Acad Med* 1992;67:500–4.
12. Silverman E. Sharing and healing through storytelling in medicine. *JAMA Intern Med* 2017;177:1409–10.
13. Ventres W, Gross P. Getting started: a call for storytelling in family medicine education. *Fam Med* 2016;48:682–7.
14. Chan TM, Jo D, Shih AW, et al. The Massive Online Needs Assessment (MONA) to inform the development of an emergency haematology educational blog series. *Perspect Med Educ* 2018;7:219–23.
15. Thorne S, Kirkham SR, Columbia B, Flynn KO. The analytic challenge in interpretive description. *Int J Qual Methods* 2004;3:1–11.
16. Hautz SC, Hautz WE, Feufel MA, Spies CD. What makes a doctor a scholar: a systematic review and content analysis of outcome frameworks. *BMC Med Educ* 2016;16:119.
17. Duffy FD. Assessing competence in communication and interpersonal skills: the Kalamazoo II report. *Acad Med* 2004;79:495–507.
18. Holm HA. Quality issues in continuing education. *Br Med J* 1998;316:621–4.
19. Thoma B, Paddock M, Purdy E, et al. Leveraging a virtual community of practice to participate in a survey-based study: a description of the METRIQ study methodology. *AEM Educ Train* 2017;1:110–3.
20. Davenport NH. Medical residents' use of narrative templates in storytelling and diagnosis. *Soc Sci Med* 2011;73:873–81.
21. Kruger J, Dunning D. Unskilled and unaware of it: how difficulties in recognizing one's own incompetence lead to inflated self-assessments. *J Pers Soc Psychol* 1999;77:1121–34.
22. Colthart I, Bagnall G, Evans A, et al. The effectiveness of self-assessment on the identification of learner needs, learner activity, and impact on clinical practice: BEME Guide no. 10. *Med Teach* 2008;30:124–45.
23. Amery J, Lapwood S, House H, Hospices DH. A study into the educational needs of children's hospice doctors: a descriptive quantitative and qualitative survey. *Palliat Med* 2004;18:727–33.
24. Eva KW, Regehr G. Self-assessment in the health professions: a reformulation and research agenda. *Acad Med* 2005;80:S46–54.
25. Eva KW, Regehr G. "I'll never play professional football" and other fallacies of self-assessment. *J Contin Educ Health Prof* 2008;28:14–9.
26. Eva KW, Cunnington JP, Reiter HI, Keane DR, Norman GR. How can I know what I don't know? Poor self assessment in a well-defined domain. *Adv Heal Sci Educ* 2004;9:211–24.
27. Regehr G, Eva K. Self-assessment, self-direction, and the self-regulating professional. *Clin Orthop Relat Res* 2006;449:34–8.
28. Sherbino J, Upadhye S, Worster A. Self-reported priorities and resources of academic emergency physicians for the maintenance of clinical competence: a pilot study. *Can J Emerg Med* 2009;11:230–4.
29. Ting DK, Thoma B, Luckett-Gatopoulos S, et al. CanadiEM: accessing a virtual community of practice to create a Canadian national medical education institution. *AEM Educ Train* 2019;3:86–91.
30. Charon R. Narrative medicine: form, function, and ethics. *Ann Intern Med* 2001;134:83–7.