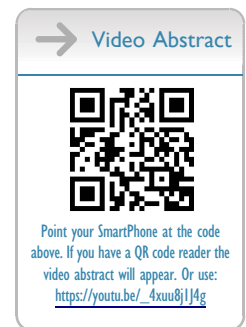


# The Tale of Designing a Clinical-Cases Manual for Rotations and Mixed Methods Analysis of Students' Participatory Experience in Co-Creation

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**Introduction:** The post-pandemic era ignited the concepts of virtual learning, enhancing a strong need for a specific clinical case manual of commonly encountered scenarios in internal medicine. In this article, we describe the process for creating a clinical cases manual which can be followed for any other clinical science. Further, we report the participatory experience of students in the co-creation of manual.

**Methods:** The hand-written notes of the teacher during the rotation of internal medicine were improvised, and created into a digital version. The editorial team which included mainly student volunteers participated in digitization and reviewing the content, diagrams and flowcharts. We describe the process of designing the clinical-cases manual for rotations in internal medicine, which includes handwritten notes, review of the notes, formation of editorial team, digitization of text and artwork, editing and book release. It can be replicated for any other clinical sciences in rotations. In addition, the online survey with both quantitative and qualitative type of questions was used to assess the students' participatory experiences in co-creating manual.

**Results:** The clinical-cases manual for rotations in internal medicine was released and received well. The online survey responses revealed that the participating students benefited in terms of professional and personal development. There was an inter-item statistical difference implying that all the participants were agreeing or strongly agreeing to survey questions. All participants agreed on the usefulness of the manual. The main themes identified through qualitative analysis were technical skills acquisition, lifelong learning and teaching, self-assessment, discipline, time management, teamwork and communication skills.

**Conclusion:** The creation of a clinical case manual for rotation, specific to the local needs can be done through a systematic process, that can be enriched by involving students. Encouraging the participation of students in co-creation is an important academic exercise that contributes to professional and personal development.

**Keywords:** clinical rotations, co-creation, students' role, clinical learning, internal medicine teaching, internal medicine rotations

## Introduction

Internal medicine rotation (IMR) is one of the most crucial pillars of graduate medical education (GME) and Competency-Based Medical Education (CBME). It shapes not only the scientific but also the emotional domain of becoming an entrusted treating doctor.<sup>1,2</sup> Bedside teaching and learning involves a preferential role played by students going bidirectionally between faculty and students.<sup>3</sup>

The last two decades have seen landmark changes in GME and medical practice. These changes include incorporating information technology tools in hospitals, regulations on doctors' duty hours, the formation of CBME, emphasis on patient safety, and healthcare quality improvement.<sup>3</sup> With the broad adoption of electronic health records (EHR) in



institutes, accessing patient case file data to medical students has also become elusive. The medicolegal concerns and billing details are some of the issues regarding restricted access for students to EHR.<sup>4</sup> The pandemic had only increased the lacunae of medical students' clinical exposure.<sup>5,6</sup> The reduced clinical exposure during the pandemic has posed decreased clinical confidence among medical graduating students.<sup>7</sup> There is also a need to prepare a medical curriculum that can sync with remote learning if any pandemics occur in future.<sup>8,9</sup>

There is a strong need for educational initiatives to bridge the transition of medical students becoming doctors.<sup>10</sup> The common clinical cases encountered during IMR become a backbone for the learning process for medical students and their succeeding batches in a medical college. Similarly, bedside clinical notes would be very valuable study material for students during their last-minute preparations for assessments. The need for such a compilation of clinical cases encountered during IMR was felt by students in the past several years in our setting.

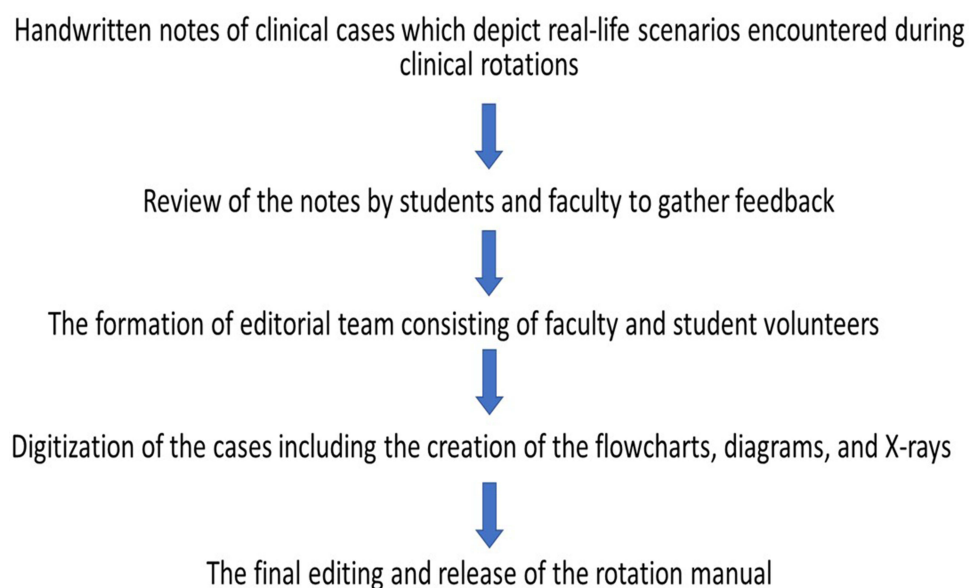
We describe the process of designing a clinical case manual for IMR with the participatory role of students. This project aimed to create a bridge between the case scenario and the standard knowledge source (clinical books, textbooks, videos), which is customized to the local conditions. Further, after editing the book, the students' experience was grasped with the help of an online survey with both a Likert scale and open-ended questions.

## Methods

The process of creating a clinical cases manual for rotations by involving students took a period of 2 years which started with handwritten notes. Case scenarios were drafted by the author (RB), during the clinics without including patient identifiers. The manual is created based on these notes, which were prepared from bedside clinics to imitate the actual case scenarios in all components: history, clinical examination, laboratory investigations, X-ray, differential diagnosis and treatment. The analysis of these case scenarios gives a specific approach that integrates basic sciences like physiology, pathology, and pharmacology with clinical internal medicine perspectives, providing students with a comprehensive understanding of disorders. The editorial team included both faculty and student volunteers.

Steps in the process of creation of clinical cases manual for rotations in internal medicine involved handwritten notes, review of the notes, formation of editorial team, digitization of text and artwork, editing and book release (Figure 1).

Representative hand-written notes of cases similar to but not exact replicas of the cases encountered were drafted. The chest x-ray, ECGs and other necessary investigations with a positive yield were hand drawn. Hand-written representative laboratory data were depicted only as increased/decreased / normal without actual values. The initial draft also included a brief and simple discussion revolving around clinical findings, with a pathophysiologic



**Figure 1** Steps in the process of creating clinical cases manual for rotations.

explanation of the phenomena, the approach to each situation, differential diagnosis, and the process of arriving at the clinical diagnosis. The management plan for each case scenario included the actual available treatment options involving drug names, standard doses, and the most critical side effects and interactions. All hand-written notes were compiled as a manual consisting of 6 sections and 450 pages. The scanned version was displayed in the central library for 15 days, and provision was made to collect comments in two separate books, one for the faculty and the other for the students.

After getting the feedback of digitization and improvisation of the notes from both faculty and students, one faculty and 14 present and past students spontaneously came forward and volunteered to be part of the project. Thus, an editorial team was formed to oversee this process at every stage. The faculty and the student volunteers interacted almost daily on WhatsApp, during weekends and vacations. This enabled the student volunteers to work at their own pace in their free time without interfering with their routine self-study.

The legibility issues of the author's handwriting were overcome by putting the photos of these portions on WhatsApp with the unreadable words encircled in distinctive colour and the page number visible. Corrections were made on WhatsApp and incorporated into the document typed by the student volunteers. One section was handed over to more than one volunteer, and the best content was included in the final manual after consensus.

The editorial team proofread added and organized the content in a meaningful sequence, which was repeatedly checked during revisions. The images were inserted at the proper slots and appropriately labelled. The faculty editor chose to colour code the images and type the material to make it visually pleasing and easy to understand. In keeping with the need to be brief and concise, it was decided to limit the contents to about 98 case scenarios and 350 pages. A table of contents with page numbers was included at the beginning of the manual. The table also gave subheadings and page numbers for each case so that the reader knew what to expect in each scenario. The index was added at the end of the manual to enable the reader to navigate to the topic of his or her choice – case, clinical findings, X-ray or ECG, laboratory profile, differential diagnosis, and final diagnosis. The index also helps the reader to directly reach the treatment given, drug lists with examinations and some essential information on adverse reactions and interactions. Some blank space is left on some pages to enable the readers to add their notes or observations.

The participating students' experience was assessed using an online survey with a questionnaire after 3 months of manual release. The survey participation was anonymized to mask their identities and was open for one month during which 2 reminders were given to complete the survey. The survey questions were modified and adopted from the previously reported study.<sup>11</sup> ([Annexure 1](#)) The survey questions were validated by two independent researchers not involved in the study. The survey was approved by the Ras Al Khaimah Medical and Health Sciences University Human Ethics Committee (RAKMHSU-HEC-03-2023/24-F-M). The online informed consent was obtained before the participation of the online survey. The statistical analysis was done by IBM SPSS Statistics (Version 27). The qualitative coding of transcript responses was done manually after data collection.

## Results

The final version of the clinical cases manual was released within the university and was well received. The survey responses from the participating students were analysed. All the questions on the Likert scale scored neutral and beyond, except for the questions on engagement with the residency program. ([Table 1](#)) The Likert scale questions (strongly disagree = 1; disagree = 2; Neutral = 3, Agree = 4; Strongly agree = 5) and their responses showed Cronbach's Alpha of 0.68 indicating the reliability of the survey questions. The items' mean score (SD) was 4.7 (0.27). All the participants agreed or strongly agreed on the survey questions. There was no statistical difference in responses among the participants, however, there was an inter-item statistical difference among questions ( $n=11$ ; Cochran's  $Q = 33.9$ ;  $P<0.001$ ).

The Thematic analysis of the survey responses identified themes such as lifelong learning and teaching, technical skills, commitment, curriculum vitae development, self-assessment, discipline and time management, teamwork and communications skills and many others ([Table 2](#)).

**Table 1** The Quantitative Analysis of the Students' Responses to Likert Scale-Based Survey Questions

Item/Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
1. This session/experience showed me the importance of professional development as a component of residency training.	0	0	1	3	10	14
2. This session/experience helped me reflect on my own professional development.	0	0	0	3	11	14
3. This session/experience helped me reflect on my own personal development.	0	0	0	2	12	14
4. I plan to get involved in another professional development activity like this in the next 12 months	0	0	1	2	11	14
5. This session/experience contributed to bonding with my peers.	0	0	3	4	7	14
6. This session/experience facilitated my engagement with the residency program	0	1	4	2	7	14
7. A. Please rate if this feature plays as pros (advantage) for the book/manual for examination/assessment point of view. USEFULNESS OF TABLE OF CONTENTS	0	0	0	0	14	14
7B. Please rate if this feature plays a pro (advantage) for the book/manual for examination/assessment point of view. USEFULNESS OF APPROACH	0	0	0	2	12	14
7C. Please rate if this feature plays a pro (advantage) for the book/manual for examination/assessment point of view. FORMAT OF CONTENTS	0	0	0	2	12	14
7D. Please rate if this feature plays a pro (advantage) for the book/manual for examination/assessment point of view. TEXT COLOURS	0	0	0	1	13	14
7E. Please rate if this feature plays as a pro (advantage) for the book/manual for examination/assessment point of view. LENGTH OF EACH CASE	0	0	0	1	13	14
7F. Please rate if this feature plays a pro (advantage) for the book/manual for examination/assessment point of view. MEMORY RETENTION	0	0	0	2	12	14

**Table 2** The Qualitative Analysis of the Students' Perceptions of the Experience of Being Part of the Editorial Team

Domain	Themes	Quote Examples
Professional and personal development	Lifelong learning and teaching	"reinforcing my commitment to lifelong learning and teaching."
	Technical skills	"definitely helped with my technical skills."
	Commitment	"take big step and commit to something..."
	Curriculum vitae development	"will make my CV strong for residency application."
	Self-assessment	"I came to know more about my capabilities."
	Discipline and time management	"It also helped with diligently improving my time management skills." "It taught me how to meet deadlines." "enjoyed typing and drawing in summer vacation, which was an absolute achievement in my free time."
	Teamwork	"know my colleagues better."
	Communication skills	"improved my communication skills."
Additional experience of being in editorial team	Understanding of bedside to book	"had a better understanding of what it takes to get information from bedside to book."
	Fun learning through drawing	"drawing for cases was interesting as it was fun learning."

(Continued)

**Table 2** (Continued).

Domain	Themes	Quote Examples
Post-participation experience	Attention to details	“helped with my skill of attention to details.”
	Inspires to write a book	“aim to write a book or clinical Manual about medicine in future.”
The overall utility of the book	Understanding and quick grasping	“quicker grasping and retention”
	Comprehensive highly useful	“well-rounded learning experience”
	Knowledge boosting and easy remembering	“I can find x-rays and labs easiest to remember in internship”
Suggestions for improvement of the book	Question bank/quiz to be added	“maybe a quiz at the end of each chapter”
	Professional designing and appealing look to be done	“probably remove drawings that are not visually appealing” “add more mnemonics and mind maps”

## Discussion

Teaching and learning during internal medicine rotations pose several challenges both for students and teachers. Our study shows that students' involvement in designing rotation manuals benefits their overall professional and personal development. The participatory role of students not only gave them firsthand experience in drafting scientific literature but also improvised the manual. The student participation in designing the manual is in concurrence with several initiatives of students' assistance/participation programmes in clinics.<sup>12</sup> Several studies have demonstrated the role of co-creation and active student participation in educational design and development.<sup>13–15</sup> The possible tripartite mutual benefits are for students and teachers, as well as the educational material developed. Further, the clinical cases manual fosters an essentiality for hybrid/virtual teaching in clinical sciences.

Our study has similarities with the virtual book club conducted during intern orientation in the emergency medicine department.<sup>11</sup> The virtual book club also positively impacted participants in areas of self-reflection, communication, deliberate practice, alignment with development and strategies to face challenges.<sup>11</sup> Our study also shares some similarities with the resident-run inpatient curriculum for interns.<sup>16</sup> The resident-run inpatient curriculum was collaborative learning through case-based, small-group sessions between expert faculty members, residents, and interns.<sup>16</sup> Ours is collaborative learning involving writing manuals of cases for IMR between expert faculty members and students about to become interns.

The positive effects on teamwork and communication are in concurrence with the recent emphasis on collaborative learning, life-long learning and decision-making skills in the educational curricula.<sup>17</sup> Though all students agreed or strongly agreed on the survey questions indicating positive feedback for academic activity, the question on facilitated engagement with the residency program showed low score. This could be because the involvement in editing the manual did not have direct contact with the patients. This could have been overcome by involving the students during the process of notes taking itself, earlier in the process.

The Association of Program Directors in Internal Medicine (APDIM) has identified four essential clinical skills expected from new interns such as organization, time management and prioritization of tasks; effective interprofessional communication within the health care team; patient basic evaluation clinical skills; and knowing when to seek assistance.<sup>18,19</sup> (Table 3) Our study also emphasizes that co-creation ensures all three domains of self-determination theory, such as autonomy, competence and feeling of relatedness.<sup>20,21</sup> (Figure 2) Thus, the experiential learning students get would enhance their self-motivation, well-being and persistence. Further involvement in a creative activity like ours fosters a higher level of “self-actualization” in the pyramid of Maslow's hierarchy of human needs.<sup>22</sup>

Similarly, there were circumstances where the positions of teacher-learner were exchanged, such as in using computer applications for developing drawings/figures for the manual. This is in agreement with positioning theory which elaborates the shared understanding and swapping of roles for achieving common goal of learning.<sup>15,23</sup> Lastly, the

**Table 3** Participatory Role of Student Volunteers While Designing the Clinical Cases Manual for Rotations and Their Contribution to Association of Program Directors in Internal Medicine Four Essential Clinical Skills

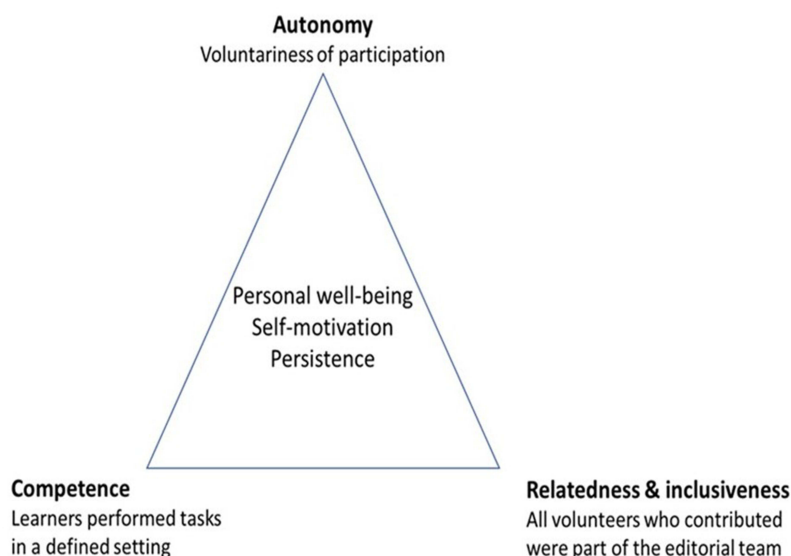
Core Clinical Skills for Sub-Interns	Participatory Role of Student Volunteers
Organization, time management and prioritization of tasks	Student volunteers organized their time well and completed the task at the appropriate time. The task was done during the vacation.
Effective interprofessional communication within the healthcare team	All the volunteers were medical students and worked as a team. There was constant communication among students during the process.
Patient basic evaluation clinical skills- identify sick vs unstick	While drafting the clinical cases, volunteers got reemphasized the knowledge domain of this skill
Knowing when to seek assistance	Student volunteers clearly experienced when to consult the teachers for more details while drafting cases.

psychological safety for openness of the students to give feedback was ensured by offering participation to the students who have already passed the assessment examinations. This is in concurrence with the recommendations studied earlier.<sup>14,24</sup>

Further, volunteers reported that they experienced enhanced self-assessment to know where they stand. This culminates in a partial enhancement of our students’ metacognition skills.<sup>25</sup> We perceive that student volunteers have acquired the skills of planning, monitoring, and evaluating due to their participatory role. Our study suggests that involving students in the process of designing educational materials leads to a more holistic development of the learners. Additionally, this approach can help clinical teachers to share their passion for teaching with their students, which is a crucial aspect of being an excellent teacher.<sup>26</sup>

Our study is survey-based, and it has the limitation of not getting the complete picture of the learners’ perspectives. Though, all volunteers responded and completed the survey, more significance need to be given to qualitative perceptions which included mostly positive feedback to the academic activity. Thus, there are limitations in generalizability of our research but essentially triggers different avenues for the involvement of students in academic activities. Further, we could do the survey only among the participating students and not all other students to know more feedback about the utility of the manual.

We recommend that medical educators self-assess and rediscover students’ participatory role during curriculum designing, course delivery and assessment. The involvement of students becomes even more crucial for clinical sciences



**Figure 2** Schematic representation of benefits for student volunteers, based on self-determination theory.



of medical colleges as the learning mainly involves the higher levels in the pyramid of Bloom's taxonomy.<sup>27,28</sup> We also recommend involvement of students in creating the teaching materials in all possible avenues. Further, follow-up on the students' perceptions and feedback after any academic activity is crucial. Medical educators must encourage their students to participate actively in the learning process and co-creation of teaching materials. Future studies in this arena should also focus on benefits for teachers by involving students in co-creation of teaching materials.

## Conclusions

The process of creating clinical cases rotation manual can be augmented with the involvement of the students. The process of developing this manual is an important academic exercise for students as it helps them improve their professional and personal development skills, which in turn makes them more competent practitioners.

## Data Sharing Statement

The data is available on request from the corresponding author.

## Ethics Approval and Informed Consent

The study has been approved by the Ras Al Khaimah Medical and Health Sciences University Human Ethics Committee (RAKMHSU-HEC-03-2023/24-F-M). The online informed consent was obtained from all participating student volunteers.

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## Disclosure

The authors declare no conflicts of interest in this work.

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## References

1. Fagan MJ, Curry RH, Gallagher SJ. The evolving role of the acting internship in the medical school curriculum. *Am J Med.* 1998;104(5):409–412. doi:10.1016/s0002-9343(98)00121-1
2. Ten Cate O, Taylor DR. The recommended description of an entrustable professional activity: AMEE guide no. 140. *Medical Teacher.* 2021;43(10):1106–1114. doi:10.1080/0142159X.2020.1838465
3. Vu TR, Angus SV, Aronowitz PB, et al. The internal medicine subinternship--now more important than ever: a joint CDIM-APDIM position paper. *J Gen Intern Med.* 2015;30(9):1369–1375. doi:10.1007/s11606-015-3261-2
4. Mintz M, Narvarte HJ, O'Brien KE, Papp KK, Thomas M, Durning SJ. Use of electronic medical records by physicians and students in academic internal medicine settings. *Acad Med.* 2009;84(12):1698–1704. doi:10.1097/ACM.0b013e3181bf9d45
5. Choi B, Jegatheeswaran L, Minocha A, Alhilani M, Nakhoul M, Mutengesa E. The impact of the COVID-19 pandemic on final year medical students in the United Kingdom: a national survey. *BMC Med Educ.* 2020;20(1):206. doi:10.1186/s12909-020-02117-1
6. Brar G, Harney S, McGarr O, McFarland J. Mentoring & support practices for final year medical students during a pandemic - "The covid doctors". *BMC Med Educ.* 2023;23(1):534. doi:10.1186/s12909-023-04513-9
7. Coronel-Couto GM, Landa-Galindez AM, Armas ML, Bonnin R. Time does matter: reduced internal medicine clerkship clinical experiences due to COVID-19. *Cureus.* 2022;14(12):e32445. doi:10.7759/cureus.32445
8. Althwanay A, Ahsan F, Oliveri F, et al. Medical education, pre- and post-pandemic era: a review article. *Cureus.* 2020;12(10):e10775. doi:10.7759/cureus.10775

9. Sani I, Hamza Y, Chedid Y, Amalendran J, Hamza N. Understanding the consequence of COVID-19 on undergraduate medical education: medical students' perspective. *Ann Med Surg.* 2020;58:117–119. doi:10.1016/j.amsu.2020.08.045
10. Church HR, Murdoch-Eaton D, Sandars J. Under- and post-graduate training to manage the acutely unwell patient: a scoping review. *BMC Med Educ.* 2023;23(1):146. doi:10.1186/s12909-023-04119-1
11. Jordan J, Bavolek RA, Dyne PL, Richard CE, Villa S, Wheaton N. A virtual book club for professional development in emergency medicine. *West J Emerg Med.* 2020;22(1):108–114. doi:10.5811/westjem.2020.11.49066
12. Crossley JG, Vivekananda-Schmidt P. Student assistantships: bridging the gap between student and doctor. *Adv Med Educ Pract.* 2015;6:447–457. doi:10.2147/AMEP.S62822
13. Brown N. Partnership in learning: how staff-student collaboration can innovate teaching. *European Journal of Teacher Education.* 2019;42(5):608–620. doi:10.1080/02619768.2019.1652905
14. Cook-Sather A, Luz A. Greater engagement in and responsibility for learning: what happens when students cross the threshold of student–faculty partnership. *Higher Education Research & Development.* 2015;34(6):1097–1109. doi:10.1080/07294360.2014.911263
15. Könings KD, Mordang S, Smeenk F, Stassen L, Ramani S. Learner involvement in the co-creation of teaching and learning: AMEE Guide No. 138. *Med Teach.* 2021;43(8):924–936. doi:10.1080/0142159X.2020.1838464
16. Caton JB, Penn EH, Nemer MK, Katz JT, Yialamas MA. Getting up to speed: a resident-led inpatient curriculum for new internal medicine interns. *MedEdPORTAL.* 2019;15:10866. doi:10.15766/mep\_2374-8265.10866
17. Konings KD, McKenney S. Participatory design of (built) learning environments. *European Journal of Education.* 2017;52(3):247–252. doi:10.1111/ejed.12232
18. Angus S, Vu TR, Halvorsen AJ, et al. What skills should new internal medicine interns have in July? A national survey of internal medicine residency program directors. *Acad Med.* 2014;89(3):432–435. doi:10.1097/ACM.000000000000133
19. Vu TR, Ferris AH, Sweet ML, et al. The new internal medicine subinternship curriculum guide: a report from the alliance for academic internal medicine. *J Gen Intern Med.* 2019;34(7):1342–1347. doi:10.1007/s11606-019-04957-0
20. Ryan RM, Deci EL, eds. *Self-Determination Theory: Basic Psychological Needs in Motivation, Development, and Wellness.* Guilford Press; 2017. doi:10.1521/978.14625/28806
21. Ryan RM, Deci EL. Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *Am Psychol.* 2000;55(1):68–78. doi:10.1037/0003-066x.55.1.68
22. Maslow AH. A theory of human motivation. *Psychological Review.* 1943;50:370–396. doi:10.1037/h0054346
23. Harré R, van Lagenhove L. *Positioning Theory: Moral Contexts of Intentional Action / Edited by Rom Harré and Luk Van Langenhove.* Blackwell; 1999.
24. Jensen K, Bennett L. Enhancing teaching and learning through dialogue: a student and staff partnership model. *International Journal for Academic Development.* 2024;21(1):41–53. doi:10.1080/1360144X.2015.1113537
25. Medina MS, Castleberry AN, Persky AM. Strategies for improving learner metacognition in health professional education. *Am J Pharm Educ.* 2017;81(4):78. doi:10.5688/ajpe81478
26. Ramani S, Leinster S. AMEE guide no. 34: teaching in the clinical environment. *Medical Teacher.* 2008;30(4):347–364. doi:10.1080/01421590802061613
27. Bloom BS, Engelhart MD, Furst EJ, Hill WH, Krathwohl DR. *Handbook I: Cognitive Domain.* New York: David McKay; 1956. Published online. <https://scholar.archive.org/work/17a35bfkqje3ictjyt4cb2fsi/access/wayback/https://www.uky.edu/~rsand1/china2018/texts/Bloom%20et%20al%20-Taxonomy%20of%20Educational%20Objectives.pdf>. Accessed March 16, 2024.
28. Krathwohl DR. A revision of Bloom's taxonomy: an overview. *Theory Pract.* Published online November 1, 2002. doi:10.1207/s15430421tip4104\_2

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