Developing tool and Measuring Integration Characteristics of Basic Science Curriculum to Improve Curriculum Integration

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ABSTRACT

Background

Integrated curriculum enhances students' learning and the retention of knowledge. At Patan Academy of Health Sciences, integrated organ system based curriculum is used with Problem Based Learning as the principle teaching learning method to foster students' learning. In addition, other approaches of integration were under taken such as integrated assessment; logical arrangement teaching learning methods (lectures and practicals); joint effort of faculty in curriculum planning and delivery; conducive environment to foster hidden curriculum. This study describes the perception of faculty and students on integration characteristics of Basic Science curriculum.

Objective

To measure the integration characteristics of Basic Science Curriculum.

Method

Tool was developed to measure integration characteristics of Basic Science Curriculum and ensure whether such planned integration has been achieved. Mixed method was used to measure the perception of the integration characteristics i) quantitatively by questionnaire survey to faculty and students ii) qualitatively by in-depth interview of students.

Result

Both faculty and students perceived that all the blocks in Basic Science was well integrated in the quantitative questionnaire survey. But, in the in-depth interview, students perceived integration of curriculum in organ system blocks were better integrated compared to Principle of Human Biology blocks where fundamentals of basic science disciplines were delivered. Students reflected that Problem Based Learning not only integrated Basic Science disciplines but also with clinical sciences and the social context. But, students perceived that Community Health Sciences curriculum was not so well integrated with Basic Science subjects.

Conclusion

Overall, this study showed that planned integration in Basic Science curriculum was successfully executed during curriculum implementation.

KEY WORDS

Basic Science, Integration characteristic, Integrated curriculum, PBL

INTRODUCTION

The real world of medical practice is transdisciplinary in large part demanding an integration of knowledge and skill from all subjects. However, the conventional medical curriculum is largely discipline based lacking higher level of integration.[1-3] The different levels of integration were characterized, beginning from traditional curriculum design where the contents are taught as separate disciplines to highly innovative integrated approach where disciplinary boundary is lost.[4,5] It has been shown that integrated medical curricula are more effective than conventional curricula.[1-3] Learning theory also reveals that integrated approach of teaching learning (T-L) enhances students' learning and improves the retention of knowledge.[6,7]

Various innovative approaches of curriculum integration has been inculcated in the medical undergraduate program of Patan Academy of Health Sciences (PAHS) to promote students' learning. This study aims to identify integration characteristics of Basic Science (BS) curriculum which can be applied to monitor and evaluate the curriculum integration.

METHODS

This study used mixed method to measure the perception of faculty and students on the integration characteristics of BS curriculum. Internal consistency of the integration characteristic tool was measured by Cronbach's alpha. Quantitative analysis was done by using SPSS V. 16 for Windows and data was expressed Mean ± SD. Ethical approval was obtained from PAHS-Institutional review committee.

A project committee through a literature review and series of discussion sessions, explained integration characteristics specific to curricular structure, T-L methods, faculty training, student assessment and hidden curriculum and came out with 50 potential integration characteristics which were later refined into 20. The Likert scale (1-strongly disagree, 2-Disagree, 3-Agree and 4-Strongly agree) was used to rate these characteristics. The questionnaire was validated by administering it to the faculty who were not involved in the tool development.

Before curriculum implementation, questionnaire was administered to faculty involved in the planning of BS curriculum and 20 faculty returned scored questionnaires on planned curriculum. To measure the faculty's perception on implemented curriculum, we chose only Principle of Human Biology (PHB) I and Cardiovascular (CVS) blocks representing fundamentals and organ system blocks (OSB) respectively.

Mixed method was used to measure the perception of students on the integration characteristics of BS curriculum. i) Questionnaire was administered to all the first batch students after completion of each of the ten blocks [PHB I, PHB II, Hemopoietic, Respiratory, CVS, Gastrointestinal (GI), Renal, Endocrinology-Reproductive, Musculoskeletal (MSK), Neurosensory blocks] of curriculum. Among 20 items of integration characteristics, 3 Items (Item 3, 14 and 15) of the questionnaire were not applicable to students. In addition, qualitative assessment was done by in-depth interview on 12 students after completion of BS curriculum. ii) After the completion of BS Curriculum implementation, 12 students were identified for in-depth interview with open ended questions which were based on the validated questionnaire on integration characteristics of BS in December 2012. Students were selected to represent all spectrum of academic performance. All interviews were conducted and recorded with informed consent. At the conclusion of interviews, first author (BRM) transcribed the recorded interviews and compared with the notes taken during the interview. BRM translated interviews in Nepali language into English. Transcribed note was shared with co-authors (SS, SKU and PP). Saturation of data was observed with 12 interviews. Since, interviews were taken after completion of curriculum implementation, recall bias could be a limitation as it was likely that students may have forgotten the detail aspect of integration in earlier blocks especially of year I.

RESULTS

A questionnaire with 20 integration characteristics was used for evaluating the PAHS BS curriculum (Table 1). On pre-validation, it was found to be highly reliable with Cronbach's Alpha (0.883). The perception of faculty on the integration characteristics of planned curriculum was good with overall mean score of 3.4±0.0 (Table 2). Consensus analysis for the 20 characteristics lies between 77.31 - 85.45% which showed a high degree of consensus among the scorers in the rating of each characteristic.

Students perceived that BS curriculum is integrated in questionnaire survey (Table 3). Further, in-depth interview revealed that integrated curriculum enhanced their learning.

"In some (integrated) blocks delivery of curriculum started with basics…it enabled us to understand more." (R4)

"I think…if I understand very well, I definitely think it is more integrated. Though integration and understanding is different entirely…if I understand well, I think it is systematically arranged." (R12)

Consistent with the perception of faculty on the planned curriculum, their perception on implemented curriculum on two blocks PHB I and CVS block was also good with identical overall mean score of 3.3±0.4 (Table 2). Again similar to the perception of faculty on the planned and implemented curriculum, the overall perception of students for the entire BS curriculum in questionnaire survey was found to be good with mean score of 3.0±0.2 ranging from

Table 1. Comparison of our study with other studies.

Item 1: Integrated organ system based curriculum is used.
Item 2: Organization of different disciplines within each integrated block is logical.
Item 3: Problem Based Learning (PBL) cases in Basic Science matches with common Clinical Presentations (CP) which forms the basis of CP curriculum for Clinical Science years.
Item 4: Early clinical exposure is provided in basic sciences.
Item 5: Community Health Science (CHS) posting provide platform to integrate knowledge and skills gained in the Basic Sciences.
Item 6: PBL is a major teaching learning methodology that integrates the Basic Science disciplines around
Item 7: PBL case integrates the Basic Sciences with societal aspects.
Item 8: PBL case integrates the basic sciences with clinical sciences.
Item 9: Teaching-learning of related basic clinical skills through patient contact in ICM is aligned with clinical problem on which PBL case is built.
Item 10: Practical sessions are aligned with PBL and lecture to enhance knowledge and skills.
Item 11: Lectures are aligned with PBL case.
Item 12: Lectures are delivered after linking its relevance to certain clinical context / applied aspect.
Item 13: Related topics from different discipline are covered in same week.
Item 14: Faculty development programs (FDP) are compatible to curriculum, teaching learning methods and assessment.
Item 15: Faculty work together to integrate the contents of their disciplines in the organ system blocks
Item 16: Faculty relates relevant content of other discipline while delivering his/her disciplinary content.
Item 17: Faculty deliver joint lecture in some topics.
Item 18: Integrated organ system based assessment is conducted.
Item 19: Student assessment takes account of knowledge and skill along with attitude.
Item 20: Distinguished personalities/experts from different fields of social life are invited to share their experience with the students as a part of extracurricular activities.

2.7 to 3.2 in all the blocks (Table 3). Interestingly, in-depth interview for the students revealed that students perceived PHB I and PHB II were less integrated compared to other OSB although they appreciated the good integration in all the blocks.

"Not much difference in year I and year II integration. But in year I, PHB I and PHB II was less integrated. When OSB began we felt integration was good…we did not feel much difference among OSB blocks." (R3)

"I cannot say blocks are not integrated…thing is some are more integrated and some less…but PHB I and PHB II…not integrated well." (R8)

However, one of the respondents perceived that PHB I and PHB II blocks were more integrated.

"All blocks were integrated well…PHB I and PHB II appears more integrated…because we got to study all the basics of subject together." (R2)

Table 2. Perception of Faculty

Planned curriculum		Implemented curriculum	
Items	Overall curriculum (n=20)	PHB I (n=10)	CVS (n=10)
Items 1	3.5±0.5	3.4±0.5	3.5±0.5
Items 2	3.4±0.5	3.2±0.4	3.5±0.5
Items 3	3.2±0.6	3.0±0.8	3.5±0.8
Items 4	3.6±0.6	3.9±0.3	3.3±0.8
Items 5	3.3±0.7	3.3±0.7	3.0±0.6
Items 6	3.5±0.6	3.7±0.5	3.7±0.5
Items 7	3.2±0.7	3.1±0.7	2.5±0.5
Items 8	3.5±0.5	3.5±0.5	3.2±0.4
Items 9	3.2±0.7	2.9±0.9	3.3±0.8
Items 10	3.3±0.6	3.7±0.7	3.8±0.4
Items 11	3.5±0.5	3.7±0.5	3.2±0.8
Items 12	3.3±0.5	3.0±0.5	3.0±0.6
Items 13	3.4±0.6	3.1±1.0	3.0±1.1
Items 14	3.5±0.5	3.5±0.5	3.2±0.4
Items 15	3.5±0.5	3.5±0.5	3.7±0.5
Items 16	3.1±0.6	3.1±0.6	2.8±0.8
Items 17	2.9±0.7	2.5±0.5	2.5±0.5
Items 18	3.4±0.6	3.5±0.5	3.7±0.5
Items 19	3.4±0.6	3.7±0.7	3.5±0.5
Items 20	3.4±0.5	3.5±0.5	3.5±0.5
Total	3.4± 0.0	3.3±0.4	3.3±0.4

A perception of faculty on planned and implemented curriculum on logical sequencing of content in a week was similar to that of the student (Table 2, 3). A mean perception of faculty on planned and implemented curriculum on a sequential arrangement of lectures (item 11) and practicals (item 10) around Problem Based Learning (PBL) was good (>3) compared to students score (<3). This differences in score could be because of repetition of lecture on PBL content or misalignment of practical and lecture with PBL as reflected by some students in an interview.

"Sometimes, lectures are not suitably aligned with PBL… there is place to improve. I think if faculty take feedback from students…and plan lecture accordingly it will be useful. (R1)

However, in-depth interview showed that the most of students perceived a good alignment of PBL with lectures and practicals in OSB except for PHB I and PHB II.

"PBL related lectures and practicals…if taught within a week makes it more integrated. In OSB, the arrangement was more logical and relevant than in PHB I and PHB II. Lectures usually comes after discussion in PBL." (R2)

"In PBL…first anatomy comes then how it function - physiology…if there is abnormality - pathology…drugs treatment - pharmacology." (R5)

Table 3. Perception of students

Items	PHB I (n=56)	PHB II (n=58)	Haemopoietic (n=56)	Respiratory (n=32)	CVS (n=57)	GI (n=53)	Renal (n=56)	Endocrine-Repro ductive (n=53)	MSK (n=57)	Neurosensory (n=47)	Total (n=525)
Items 1	3.1±0.6	3.3±0.7	3.1±0.6	3.1±0.3	3.3±0.7	3.1±0.5	3.1±0.5	3.2±0.5	2.9±0.5	3.1±0.5	3.1±0.6
Items 2	3.0±0.5	3.2±0.6	3.0±0.5	3.1±0.5	3.2±0.6	3.1±0.5	3.1±0.6	2.9±0.6	2.9±0.5	2.9±0.6	3.0±0.5
Items 4	3.5±0.6	3.4±0.7	3.5±0.6	3.3±0.5	3.5±0.6	3.4±0.6	3.1±0.7	3.1±0.5	3.1±0.6	3.1±0.6	3.3±0.7
Items 5	3.2±0.6	3.0±0.7	3.2±0.6	2.9±0.7	2.9±0.8	2.8±0.6	2.5±0.9	2.6±0.8	2.6±0.8	2.8±0.5	2.8±0.8
Items 6	2.9±0.7	3.2±0.8	2.9±0.7	3.2±0.6	3.3±0.7	3.3±0.7	3.3±0.6	3.2±0.7	3.1±0.6	3.1±0.6	3.2±0.7
Items 7	3.1±0.4	3.2±0.6	3.1±0.4	3.2±0.6	3.2±0.6	2.9±0.8	3.0±0.8	2.8±0.7	2.7±0.8	2.7±0.6	3.0±0.7
Items 8	3.0±0.7	3.4±0.7	3.0±0.7	3.3±0.5	3.5±0.6	3.3±0.7	3.3±0.6	3.2±0.6	3.0±0.6	3.3±0.5	3.2±0.6
Items 9	3.3±0.7	2.8±0.5	3.3±0.7	3.0±0.7	3.2±0.8	3.2±0.8	3.1±0.7	3.1±0.6	2.8±0.8	2.9±0.7	3.1±0.8
Items 10	3.1±0.5	2.8±0.6	3.1±0.5	3.1±0.4	3.3±0.6	2.8±0.7	2.8±0.8	2.6±0.8	2.8±0.7	2.8±0.6	2.9±0.7
Items 11	3.1±0.4	2.6±0.9	3.1±0.4	3.0±0.7	3.5±0.7	2.6±0.7	2.7±0.8	2.7±0.9	2.5±0.8	2.8±0.7	2.9±0.8
Items 12	3.1±0.6	2.5±0.8	3.1±0.6	2.9±0.6	3.4±0.6	2.5±0.9	2.8±0.7	2.7±0.8	2.4±0.8	2.6±0.6	2.8±0.8
Items 13	3.1±0.6	2.9±0.8	3.1±0.6	3.1±0.6	3.4±0.7	2.8±0.8	3.0±0.7	2.8±0.7	2.6±0.7	3.0±0.6	3.0±0.7
Items 16	3.0±0.3	2.6±0.6	3.0±0.3	3.0±0.6	3.1±0.7	2.7±0.7	2.7±0.7	2.7±0.6	2.5±0.7	2.7±0.7	2.8±0.7
Items 17	2.6±0.7	2.9±0.6	2.6±0.7	2.7±0.7	3.0±0.8	2.1±0.8	2.3±0.9	2.3±0.9	2.1±0.9	2.3±0.8	2.5±0.9
Items 18	2.9±0.3	2.8±0.8	2.9±0.3	3.0±0.7	3.0±0.7	2.8±0.8	3.0±0.5	2.7±0.8	2.5±0.8	2.8±0.6	2.8±0.7
Items 19	3.2±0.5	3±0.5	3.2±0.5	3.1±0.5	3.2±0.6	3.0±0.6	2.9±0.8	2.9±0.7	2.5±0.9	3.1±0.5	3.0±0.7
Items 20	3.2±0.6	3.4±0.6	3.2±0.6	3.1±0.4	3.2±0.7	3.0±0.6	3.0±0.7	3.0±0.6	2.9±0.6	2.9±0.7	3.1±0.6
Total	3.1±0.2	3.0±0.3	3.1±0.2	3.1±0.1	3.2±0.2	2.9±0.3	2.9±0.3	2.8±0.2	2.7±0.3	2.9±0.2	3.0±0.2

"Lectures and practicals are related to PBL case. In diabetes case…practical in biochemistry was blood glucose estimation. In clotting disorder case…bleeding time, clotting time in physiology practical." (R9)

All students perceived PBL integrated not only basic sciences but also with clinical science and societal aspect (Table 3). Similar reflection was made in in-depth interview by students.

"In PBL all subjects are integrated well. Most of case scenarios presented are from village…we could know…how to follow to treat patient." (R1)

"PBL case…in all the blocks…is more important to integrate anatomy, physiology, pathology, pharmacology." (R5)

Although faculty perceived that Community Health Sciences (CHS) curriculum was well integrated with BS (Table 2), student average score on item 5 which was related to the integration of BS learning during CHS posting was scored <3 in all the blocks (Table 3). Consistently, in-depth interview with students reflected that the BS is not integrated with CHS. However, students felt that the delivery of CHS content prior CHS posting were relevant and were able to correlate pharmacological and pathological learning with clinical cases during CHS posting as follow.

"CHS content learned before posting about field visit…data collection, group discussion, focus group discussion were useful, but BS subjects…Anatomy, Physiology…not really used…but helped indirectly not directly." (R7)

"Generally not Anatomy but Physiology, Pharmacology, Pathology…if some test then Biochemistry and Microbiology are revisited in CHS posting. If some patient comes in health post…we discuss about case among friends." (R9)

"PBL case about CHS was useful which was introduced before CHS posting. I think… BS subjects…did not really came in CHS posting." (R10)

At PAHS, faculty perceived that faculty development workshop enabled faculty to deliver the integrated curriculum effectively (Table 2). Also, they agreed that they work together to align and integrate the contents of their disciplines in all the blocks of BS curriculum (Table 2). Faculty even agreed that they worked together with other disciplines to develop and plan delivery of integrated curriculum along with giving relevance to other disciplines and clinical context while delivering their disciplinary content (Table 2). Students also reflected that faculty work together "Faculty already planned some learning objectives in PBL and others in lecture…so PBL and lecture are aligned." (R7)

The perception of faculty on both the planned and implemented curriculum on joint lecture was similar with low score <3 in item 17 (Table 2). Consistently, students also scored low in the joint lectures (Table 3) and they had a similar reflection on interview that "Not much joint lecture…faculty will say…you will study in other subjects." (R3). However, students perceived that more integration could have been achieved with joint lectures. "When

faculty sits together and deliver lecture…I feel it is more integrated." (R1)

Students appreciated the Early Clinical Exposure (ECE) during BS through Introduction to Clinical Medicine (ICM) course which was reflected in the questionnaire survey with a score >3 in item 4 (Table 3). Consistently, in-depth interview, students perceived that patient case in PBL provided ECE and learnt relevant basic clinical skills in the OSB. However, students scored low (<3) in item 10 related to alignment of patient case in ICM with PBL case and students reflected as below.

"Specifically, if I have to say, it is ICM (for ECE), where we have opportunity to talk with patient. In PBL…we imagine a real patient…and feel we are diagnosing…and treating patients. The patient we see in ICM class is not as that of PBL case." (R2)

"We rarely see the patient in hospital during ICM class… which is similar to PBL case. But, when we saw leprosy patient in hospital after completing a PBL case on leprosy…I could visualize case…integrate with case study… things reinforced learning, clarified misconceptions. I still remember now…I don't need to rot memorize those classical symptoms." (R3)

"We get ECE through ICM classes and it is rare…we see similar patient case in ICM as of PBL. In hospital setting… it may not be feasible to get same patient…also even some group may see and others don't." (R11)

Integrated OSB curriculum with PBL as principle T-L method is used at PAHS, hence, it is important to design similar assessment methods to facilitate students' learning because assessment drives learning (Miller GE, 1919-1998). This was evident from the positive perception of faculty on PAHS undertaking different aspect of assessment such as knowledge, skill and attitude on both planned and implemented curriculum (Table 2). On in-depth interview, students agreed that assessment was integrated and they reflected that Problem Based Questions (PBQs) were more integrated which then was followed by Multiple Choice Questions (MCQs) and Objective Structured Practical Examination/ Objective Structured Clinical Examination (OSPE/OSCE).

"PBQ and MCQ…both integrated well but not OCSE/OSPE. I think…MCQ is more integrated…because scenario is given which touches many fields…at last question comes… question can be asked from different discipline. Scenario makes us think broadly." (R5)

"Marking is integrated rather than discipline based. Even though I don't do well in one subject…I can pass in exam. PBQ is more integrated…MCQ and OSPE/OSCE not integrated well." (R7)

"MCQ, PBQ are integrated…relatively PBQ more integrated…OSPE/OSCE not integrated. Just seeing MCQ, we can say…it is form anatomy, biochemistry, physiology… but still it is integrated because they are not asked directly… and vignette makes us think broadly." (R8)

"PBQ is more integrated…MCQ not as such…but scenario is quite helpful. Knowledge is assessed in PBQ/MCQ, Skill in OSPE/OSCE and attitude in PBL." (R11) Students also reflected that CHS examination is not integrated with BS disciplines (R2).

Both faculty and students agreed of having exposure to the hidden curriculum which PAHS tried to impart among students through invited talks from distinguished personalities/experts from different fields of social life to share their experience with the students.

DISCUSSION

PAHS has designed and implemented an integrated BS curriculum in undergraduate medical program along with the innovative approaches in teaching learning methods. In order to ensure an optimal integration, faculty also worked together during curriculum planning and implementation. Various innovative approaches were undertaken to maximize integration which includes OSB curriculum, PBL as a principal teaching methodology, integrated assessment method along with ECE through ICM and community exposure through CHS.

A high score in questionnaire survey of PHB I and PHB II despite students' perception of lesser integration compared to OSB on in-depth interview could be because of a difference in the timing of perception measurement. In-depth interview conducted after the end of completion of 2 years BS curriculum may have given students an opportunity to compare the integration among different blocks which was not the case in questionnaire survey since students' perception was measured immediately after the end of each block. During curriculum planning also it was planned to deliver the fundamentals of BS subjects in PHB I and PHB II contents in the beginning for a smooth transition into OSB. Although integration of all BS subjects were not feasible there, it was ensured to integrate at least two disciplines in a PBL case. The good score in questionnaire survey in PHB I and PHB II did indicate that students perceived a discernible integration in these blocks although it was found less well integrated in comparison to OSB.

PBL provides a suitable platform to integrate BS curricular content with the Clinical Sciences by using relevant clinical case scenarios.[8] It is also expected that this integration of knowledge will help to promote deep and lifelong learning, as well as enhancing generic skills such as communication, leadership, and teamwork.[9] All students perceived PBL is the basis of determining integration and it integrated not only basic sciences but also with clinical science and societal aspect. And when curriculum is integrated, they understood more. This suggests that in our context also

attributes of PBL are achieved. Nevertheless, this study indicate that there is a place of improvement in the alignment of practical and lecture with PBL.

Achieving integrated medical education requires the medical faculty to plan appropriate instructional strategies.[10] Our study showed that faculty work together in both planning and delivery of the curriculum, further it was substantiated by the students' perception on a priori plan of faculty in allocating curricular objectives in PBL and lecture. On contrary, there was a consistent low score on conduction of joint lectures from both the students and faculty. The ineffective joint lectures at execution level, despite it being known to increase the level of integration could be either a limitation of faculty time or a lack of planning with other discipline to deliver joint lecture.[11] Although it is challenging, provision of conducive environment to conduct joint lectures could improve the level of integration.

ECE to the students help them to relate BS learning in clinical context.[12,13] Students appreciated the ECE from the beginning of BS and when they get the real patient, although a few, it helped them to correlate the BS learning in real patient case scenario. A reason for students scoring low in item 10 which was related with alignment of patient case in ICM with PBL case could be a rare concurrence of the real patient case in ICM to that of a PBL case. Similarly, students also acknowledged the difficulty of such coincidence for the availability of clinical case similar to PBL case in the ward during ICM class.

Although assessment of attitude is important to improve doctor-patient relationship, it is less frequently applied as the summative assessment in the medical colleges.[14,15] Attitude assessment through validated tools in PBL and community based learning and education at PAHS is a novel initiative undertaken to cover wider aspect of assessment. Among three ways (PBQs, MCQs, viva) used to assess knowledge of students, they perceived PBQs as the most integrated assessment followed by MCQs. Vignette in MCQ increase level of understanding to comprehension, in this study students also considered the presence of vignette in MCQ made it more integrated.[16] Skill is assessed through OSPE/OSCE which students reflected as the least integrated assessment. The low score (<3) by students on item 18 related to integrated assessment may be because most of the students did not consider MCQ and OSPE/OSCE as an integrated assessment.

The hidden curriculum has a significant impact on the medical professionalism.[17] This will give students an opportunity to be exposed to different aspect of life besides their curricular knowledge. Both faculty and students perceived the provision of environment to support hidden curriculum. This multiple dimensional exposure beside their medical curriculum could impart essential attributes to achieve PAHS mission to narrow the healthcare disparity between the rural and urban Nepalese.

The faculty's perception on implemented curriculum was measured only for two blocks i.e. PHB I and CVS. It would have been better to have faculty's perception on other blocks of Basic Sciences. In-depth interview was conducted with students but not with faculty to measure the perception on implemented integrated basic science curriculum. Faculty's in-depth interview would have provided a better prospect to explore on the consistency of planned and implemented curriculum.

CONCLUSION

The consistent perception of faculty and students on integration characteristics showed that planned integration of curriculum was successfully executed during curriculum implementation. PBL, the main T-L method, was found to have a large impact on the higher scoring of integration characteristics. However, there are places where more initiatives can be taken to overcome a challenge in efficient integration of CHS curriculum (and aligning ICM sessions with clinical cases matching with PBL case of the week) for more holistic approach of BS curriculum delivery.

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