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Exploring online learning interactions among medical students during a self-initiated enrichment year

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Abstract

Introduction: A novel initiative allowed third year medical students to pursue experiential learning during a year-long Enrichment Year programme as part of the core curriculum. ‘connect*ed’, an online virtual community of learning was developed to provide learning and social support to students and to help them link their diverse experiences with the common goal of being a doctor. This study examined the nature, pattern, and content of online interactions among medical students within this community of learning to identify features that support learning and personal growth.

Methods: This was a quantitative-qualitative study using platform data analytics, social network analysis, thematic content analysis to analyse the nature and pattern of online interactions. Focus group interviews with the faculty mentors and medical students were used to triangulate the results.

Results: Students favoured online interactions focused on sharing and learning from each other rather than structured tasks. Multimedia content, especially images, attracted more attention and stimulated more constructive discussion. We identified five patterns of interaction. The degree centrality and reciprocity did not affect the team interactivity but mutual encouragement by team members and mentors can promote a positive team dynamic.

Conclusion: Online interactions that are less structured, relate to personal interests, and use of multimedia appear to generate the most meaningful content and teams do not necessarily need to have a leader to be effective. A structured online network that adopts these features can better support learners who are geographically separated and engaged in different learning experiences.

Keywords: *Online Learning, Undergraduate, Interaction, Experiential Learning*

Practice Highlights

- Image-based messages and less structured online activities focused on experience-sharing engage students and stimulate a more constructive discussion.
- The proactivity of students and mentors can foster a positive team dynamic and learning experience.
- A team or group leader is not always necessary to promote group interaction.

I. INTRODUCTION

Increasingly, medical schools are recognising the potential of a holistic, experiential curriculum to nurture the professional development of their students (Kallail et al., 2020). A growing body of evidence supports the benefits of experiential learning. Experiential learning has been associated with increasing interest in learning (Kallail et al., 2020) a better understanding of career choice (Lyons, 2017), and higher-order critical thinking skills (Alamodi et al., 2018).

Beginning in 2018-19, the Li Ka Shing Faculty of Medicine of The University of Hong Kong (HKUMed) introduced a mandatory, credit-bearing Enrichment Year for all third-year medical students. This initiative provided opportunities for substantive engagement in a personal area of interest related to research, service or humanitarian work, pursuit of a higher degree, or university exchange anywhere in the world in order to

further the professional and personal development of students.

Recognising the difficulties students may encounter when they are off-campus and the need to support student experiential learning, we developed an online virtual community of learning called ‘*connect*ed*’ to provide learning and social support to students and to help them link their diverse experiences with their common goal of becoming a doctor. The idea of an online virtual learning space is well situated within the social constructivist theoretical framework (Vygotsky, 1978) which views social interaction as the basis for learning. Individuals develop and construct knowledge better when interacting with others rather than unilaterally receiving information, thereby conceptualising learning as a collaborative process. Building on this idea, Lave and Wenger discussed ‘communities of practice’ in which socially supported learning takes place (Lave & Wenger, 1991). In this related theory, social learning takes place within communities of practice defined as groups who have a common interest or domain, who engage and interact in shared activities thus developing a relationship. This dialogic interaction among the learner, peers and tutor evolves over time and can take place and be captured in the virtual learning space to support the evolution of work (Greenberg, 2006). In the higher education setting, online discussion forums, or web 2.0 technologies such as blogs and wikis draw on the benefits of social learning and communities of practice giving students time to think, contribute and give and receive feedback to help their learning.

This aim of this study is to examine the nature, pattern, and content of online interactions among medical students within the virtual community of learning, *connect*ed*, to identify features that support learning and personal growth. Findings will offer insight on how to further optimize collaborative online learning.

II. METHODS

A. Context

During the Enrichment Year, students were allocated to teams with a designated faculty mentor. Team composition was designed to maximise diversity of learning experiences, hence each team would have at least one student who was doing research, one doing service or humanitarian work, and one pursuing an exchange opportunity abroad. This allowed students to benefit from the experiences of their teammates. Prior to departure, a Launch Day was convened in June 2018 to facilitate team cohesion among members and their mentor, to familiarise with the *connect*ed* objectives, the e-learning platform, mentor and student teammates.

We chose to use the commercially developed e-platform, *Workplace by Facebook* to house *connect*ed* after extensive consultation and testing with stakeholders. The interface of *Workplace* is very similar to Facebook but operates in a closed community only accessible to registered *connect*ed* users. This helped to address legitimate privacy and confidentiality concerns while providing a user-friendly and familiar platform that students and teachers were willing to use.

Teams were encouraged to share their learning experience with each other and with their mentor on *Workplace*. Structured learning modules called “Inquiry Pods” (IP) were released online on a regular basis to help facilitate the sharing and discussion. The themes for the inquiry pods were communicator, ethical decision-maker, and global citizen, based on the six educational aims and learning outcomes of the university and the Bachelor of Medicine and Bachelor of Surgery (MBBS) programme (HKU, 2017). Students completed each IP by posting, commenting, and reacting to trigger material provided in the IP or based on their own/others Enrichment Year experience. Most of the posts were photos, video, text, or sharing of online information, via hyperlinks.

*connect*ed* is a graded component of the Enrichment Year and students must earn a pass (60%) in order to proceed to the next year of study. Team mentors graded each inquiry pod as a formative assessment, and at the end of the year, provided a summative assessment based the overall performance in the IP, online participation and team impact presentation. All the assessments were rubric-based (Appendix 1: Grading rubrics).

B. Study Design

This was a mixed methods quantitative-qualitative study that combined analyses of platform analytic data and qualitative information drawn from student work and focus group discussions (FGD) used to provide a richer understanding of online learning interactions among students (Ma, 2012).

C. Subjects

In the academic year 2018-19, 206 students participated in the Enrichment Year. They participated in 302 activities in Hong Kong and in 23 different cities around the world (Appendix 2: Activities undertaken by students in 2018-2019). These students were selectively divided into 33 teams of five to eight students, according to gender, destination and nature of activities, to ensure the most diversified combination of members.

D. Data Sources, Collection and Analysis

1) *Level of activity*: At the end of the first academic year, we evaluated the students' online activity by analysing the usage data collected through the Application Programming Interface (API) of *Workplace* from June 2018 to May 2019. These showed the frequency of activity in terms of students, mentors and teams who posted, commented, replied, and reacted on the platform.

2) *Social network interaction*: Social network analysis is a method for studying the structure of relationships and the effect this social structure has on the attitudes, behaviour, and performance of the individual members of a group (Saqr et al., 2018). We extracted the Workplace data using Workplace Graph API, which allowed us to create objects by nodes and joined along edges, and developed a web tool (PHP +Vue.js+jQuery) to export data from Workplace. We focused our analysis on team members' position and role in teams. The extracted data were imported to the open source software, Gephi that generated a graph for social network analysis. The software used nodes and edges to represent the connections between each member of the team and presented the interactions within the social network in terms of the size, gradient, and direction of the communication (Bastian et al., 2009).

3) *Content of posts*: The content of posts by each team was analysed for common themes based on the type of messages posted on the platform. Initial codes were generated based on the purpose of the posts and then categorised to find the essence of each theme. This allowed us to identify how students were using the

platform and thereby understand the basic functions of the virtual community of learning.

4) *Feedback and focus group discussion*: We conducted FGD with students and mentors from March - June 2019. There were 13 FGD with 30 mentors and three with 9 students. Participation in FGD was voluntary and no monetary incentive was given to students or mentors. For mentors, the FGD was part of the evaluation, feedback and engagement effort to encourage mentors to continue their involvement in their project which is why all mentors were invited and most participated. Therefore, the participation rate was high. For the students' sessions, there was a purposive selection of subjects based on student volunteers who were keen to share their experience and deliberate invitation to those who were comparatively inactive in the project. Each interview session lasted for 60 to 90 minutes. A semi-structured interview guide with pre-determined questions was used to focus the conversation on desired themes. The questions for both mentors and students were similar and covered participants' experiences with connect*ed, using the Workplace platform, challenges and suggestions for improvement. All FGD were recorded by contemporaneous notes that were organised immediately following each session.

III. RESULTS

A. Level of Activity

There was a total of 815 posts, 8198 comments, and 6250 emoticon reactions: like (5843), love (169), haha (152), wow (71), sad (14), and angry (1) by 206 students and 33 mentors as summarised in Table 1.

	Post (average)	Comment (average)	Reaction (average)
Mentor N=33	539 (16.3)	1484 (44.9)	3017 (91.4)
Students N=206	276 (1.3)	6714 (32.6)	3233 (15.7)
Total	815	8198	6250

Table 1. Summary of online interactions in 2018-19

B. Social Network Interaction

The pattern of interactions was visually represented in a social network analysis by Gephi. In the diagram, the red node represents the mentor, the green node represents the students. The edge between the nodes represents the interactions. The thicker and darker colour of the edge represents more interaction. The arrow represents the direction of the communication.

We categorised the patterns according to the number of responses of mentor and students. By comparing the frequency of responses (posts, comments, and reactions), we found that there were five common patterns of interaction that were reflected in all teams, regardless of their level of activity as summarised in Table 2.

Pattern	Frequency of Posts	Frequency of Comments	Frequency of Reactions	Team identifier
1	High (from mentor)	High (from mentor)	High (from mentor)	1, 9, 10, 11, 17, 21, 25, 26, 33,
2	High from mentor	High from mentor	Average/Low from mentor	2, 19, 31
3	High from mentor	Low from mentor	Average/Low from mentor	3, 7, 14, 18, 28
4	High from mentor	Low from mentor	High from mentor	4, 6, 12, 13, 15, 20, 23, 27, 29
5	High from mentor	Average from mentor and students	Any frequency	5, 8, 16, 22, 24, 30, 32

Remark: H=high participation compare to team average; A=average participation that mentors are having similar amount of participation as students; L= low participation compare to team average

Table 2. Patterns of interactions among teams

In general, all mentors were more active than students as teachers initiated new posts and were often keen to share information with students (Appendix 3). Even when

students were encouraged to create new posts, they tended to focus on completing the tasks in the Inquiry Pods.

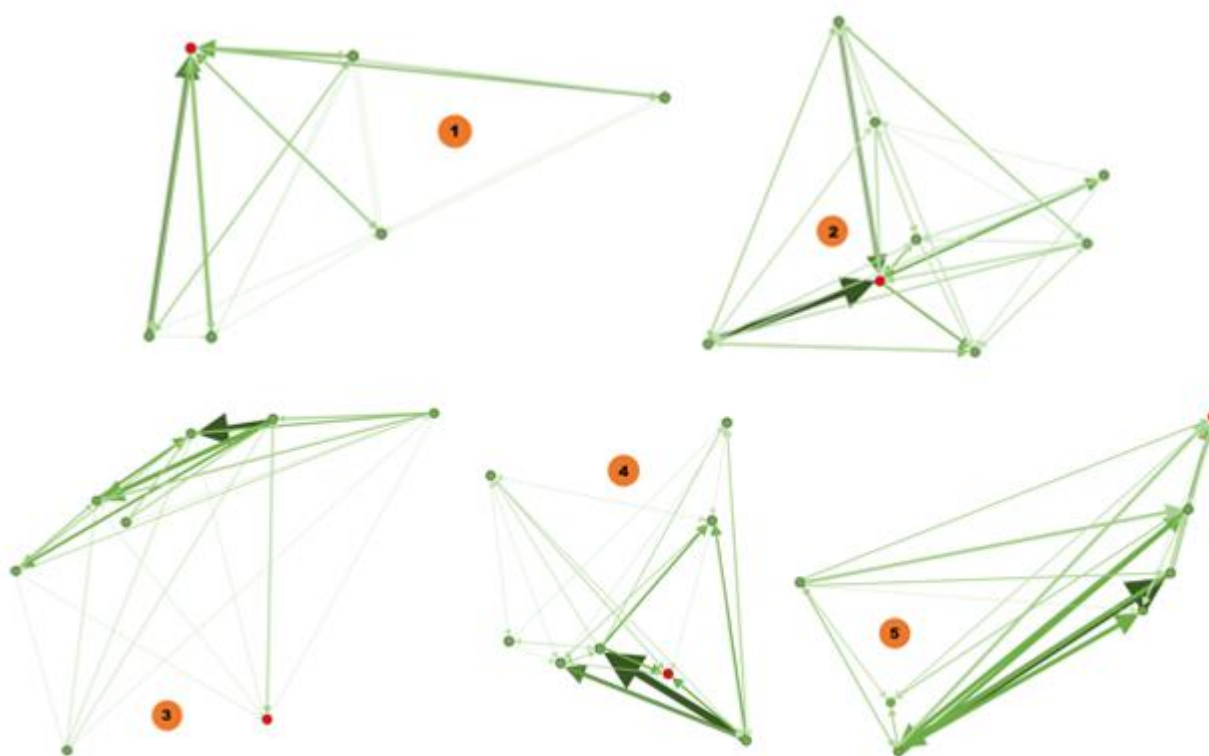


Diagram 1: Patterns of online interactions by teams

1) *Pattern 1: Mentor degree centrality:* We found that the number of responses from mentors were much higher than the students. For example, in Team 1, the mentor made 113 posts, 236 comments, and 227 reactions, while the five students made between 1-5 posts, 38-54 comments, and 14-43 reactions. Mentors were the centre point and driving force of the interaction. Students interact with others in response to mentor facilitation making the degree centrality towards to the mentor. The thickness of the edges is evenly distributed indicating a consistent level of interaction among all team members.

2) *Pattern 2: Mentor degree centrality:* Similar to Pattern 1, mentors were also active in posting and commenting, but gave much fewer reactions than students. The centre point is towards the mentor, and also the most active students in the team as shown by the two thick edges in the diagram. For instance, in team 2, the mentor posted 43 posts, 127 comments, and 19 reactions, while the seven students posted 1 to 12 post, 28 to 65 comments, and 8 to 66 reactions respectively. In this pattern, mentor was also the centre point, however, some nodes of students shared thicker edges.

3) *Pattern 3: Student degree centrality*: Team 3 is such an example, showing that the thick arrows are pointing towards students, meaning that the interaction is initiated by students. The mentor took a less important role in the conversations. The degree centrality is towards students and the mentor was outside of the interaction centre. For instance, in team 3, the mentor posted 12 posts, 19 comments, and 20 reactions, while the seven students posted 1 to 12 post, 17 to 68 comments, and 0 to 64 reactions respectively. In this pattern, mentor was situated outside the conversation circle. The degree of centrality shifted to students.

4) *Pattern 4: Student degree centrality*: The dynamics of interaction leaned towards active students, which were represented by the thick edges towards certain students. In this pattern, there were usually multiple centre points that did not include the mentor. For instance, in team 4, the mentor posted 11 posts, 27 comments, and 90 reactions, while the seven students posted 0 to 3 post, 28 to 78 comments, and 0 to 39 reactions respectively. The degree of centrality shifted to multiple students.

5) *Pattern 5: Diversified degree centrality*: Mentors were active in posting, having similar frequency of comments as the students and the number of comments among all members are the same, and having low reactions. In this pattern, there are multiple conversation nodes and most are interactions between students. Those interactions are more student-driven and indicate multi-centred conversation. For instance, in team 5, the mentor posted 18 posts, 36 comments, and 3 reactions, while the six students posted 0 to 3 post, 31 to 62 comments, and 4 to 29 reactions respectively. The degree of centrality shifted to more than one student. In this pattern, there is more interaction between students as shown by the bi-directional arrows. The degree centrality is low with diversified centres.

These patterns show that teams could have single-centred interaction (Pattern 1 & 2) or multi-centred interaction (Pattern 3, 4, & 5) with each representing different team interactions. Team activity, and not the centeredness of the interaction, was associated with the effectiveness of collaboration and the completion of tasks. In addition, most teams demonstrated one-way communication when interacting. That means the reciprocity of a network is low. In Teams 1 and 2, the interaction dynamics favoured the mentors, while in Teams 3, 4, and 5, the dynamics leaned towards active students. In contrast, team 5 demonstrated strong reciprocity.

However, after comparing the patterns of all 33 teams, there is no indication that a certain pattern was better than

the others. There was no significant difference in the on-time completion rate for the IP assignments for the five most active teams (86.9%) compared with all 33 teams (85.5%).

C. Content of Posts

In *connect*ed*, students shared their Enrichment Year experience using text, photo, video, or related links of other websites. The nature of interactions was predominantly text-based, as it is easier to post and interact using the text. However, image-based messages attracted more attention and stimulated a more constructive discussion.

There were three particular areas that generated greater levels of interactivity. Firstly, students were very willing to share and reflect on their personal experiences. Taking the 'Communicator' Inquiry Pod as an example, students shared their observations on communication in their respective settings by posting on the team wall:

"There is a huge contrast here, where students actively ask questions even if the setting involves 80+ students. I suppose the background behind the two nationalities have a huge role in it, as Asians tend to be a bit more shy compared to the extrovertiveness commonly shared by Westerners. While we should embrace who we were and are, I think it is also beneficial to observe others and learn from such observations."

Student A (studied abroad)

This text-based conversation thread compared and contrasted effective classroom communication in different countries. It enabled students to reflect and to draw on their own experiences to benefit all team members.

The second area of interest for students was social support. One of the most popular activities was the posting of photos and videos about their Enrichment Year activities including when they are performing social service missions, cooking a gourmet meal or joining group gatherings during festive occasions. Those posts generated numerous responses and reactions indicating a keen interest in reaching out and maintaining social connectedness.

Thirdly, students were more active online when there was information being shared related to the medical practice and they are more willing to discuss their views as shown in this sequence from Team 3:

"Being a MBBS student, people around may ask us for medical advice. They think we are knowledgeable to

make a diagnosis based on their description and believe we are able to help. However, as we are not yet qualified, it is inappropriate for us to give any professional opinion. Sometimes, I would like to share what I have learnt and suggest some possible solutions. Nevertheless, at the same time, I am afraid my opinion would affect their health seeking behaviour, for instance, they might just follow what I share instead of seeing a doctor.”

Student B

“It's true that we are not knowledgeable enough to give medical advice and it will be misleading to our relatives and friends if they take our opinions as professional advice and decide not to seek proper medical opinions. Thus, we should always remind ourselves of the role as medical students and think about the impacts of our words.”

Student C

“I understand your feeling as my relatives and friends also ask me for medical advice. It will be safer to advise them to seek help from medical professionals for diagnosis or other serious health issues. However, as a medical student, I think it is possible for us to give them some lifestyle advice without causing harmful consequences, for instance, smoking cessation, diet with lower cholesterol content and moderate exercise. Although we are not qualified to make a diagnosis at the moment, we can still use our medical knowledge as a way to promote public health and arise their health conscious.”

Student D

Students more actively express their opinions when the topics under discussion are related to the profession they are aiming to join.

D. Feedback and Focus Group Interviews

Although there were only 9 student interviewees, we found repeated themes and content suggesting data saturation. This may be because *connect*ed* comprised only 10% of the overall Enrichment Year and students did not pay particular attention to this component resulting in little variation in responses during the FGD.

The main theme that arose from the FGD with students and mentors was about the most rewarding aspect of the online interaction in *connect*ed*. Both groups indicated that this was the social connectivity attained through student sharing of day-to-day life during the Enrichment Year.

“The photo and video did not need much effort to share with others, but they are more interesting and can let me know more about how others were doing during their Enrichment Year.”

Student E

“I am very interested in knowing the life of others in other universities. I hope they can share more and we could see others' videos.”

Student F

“Sharing things we learned with the team could help us to be more socialized.”

Student G

Mentors also enjoyed knowing more about students' Enrichment Year life and believed that students should enjoy themselves while learning.

“The *connect*ed* is a good example helping students to bridge their knowledge and core value. The sharing of experience (related to the Enrichment Year) is important, it engages students in the discussion”

Mentor X

“The platform support each other very well. This is a platform for socializing and communicating. I know what students are doing if they posted on the team wall.”

Mentor Y

The value of social connectivity for support was further emphasized by students suggesting that the platform was more useful for social networking than learning.

“*connect*ed* provided a platform for us sharing the struggles and support each other when I was having my Enrichment Year.”

Student I

This view was echoed by mentors who believed that *connect*ed* provided necessary support for students especially those who were overseas. Mentors used the chat function on *Workplace* to have personalized communication with their members and to offer advice.

“I used the chat function on the *Workplace*, which is more personal and can support each other very well.... I can have immediate interaction with students.”

Mentor Z

Students found mentors were motivating and encouraged them to interact in teams which led to some mentor-centric team interactions.

“Our mentor is very motivating and encourages all members to participate in the discussion. She guided us through to complete the inquiry pods.”

Student J

“In my team, there are some inactive members who have demotivated me to interact. If there is an active member, I think it would help.”

Student K

The findings also indicated that proactivity by student members, participation by the mentor, responsiveness, and social/non-academic discussions fostered a positive team dynamic and a positive online learning experience, regardless of whether the team interaction was primarily single-centred or multi-centred.

IV. DISCUSSION

This study examined the nature, pattern, and content of online interactions among medical students within a virtual community of learning among the inaugural cohort of the Enrichment Year to identify features that support learning and personal growth.

Our results found that students favoured online interactions that were less structured, image-rich and focused on sharing of experience to learn from each other and to support one another. Multimedia content, especially images, attracted more attention and stimulated discussion that was more constructive. This is consistent with findings in the literature that show that images have a positive influence on learning and engagement (Chan & Unsworth, 2011; Stuijzand et al., 2016). Sharing of personal experience helped students to reflect on their own experience and explore how others experienced their Enrichment Year. The results support previous studies that suggest self-reflection and community building enhances experiential learning (Arnold & Paulus, 2010; Pai, 2016). This builds a virtual community that allows students to share their struggles which students found to be a crucial aspect of giving and receiving social support. The use of the different modes of communication available on *Workplace*, including the text messaging and voice calls as well as social media posting provided flexible avenues of support to students. The finding is very similar to the outcomes of a project involving a mobile application for experiential learning activities (Schnepp & Rogers, 2017). We also observed that the number of positive reactions (like, love, haha or wow) far exceeded the number of negative reactions (sad

and angry). This is a visual form of encouragement from mentors and peers that reflected their interest in engaging with each other.

From the patterns derived from our social network analysis, we found that the interaction could be uni-directional or bi-directional, but there was no correlation of the interaction with team effectiveness in completing tasks on time. As seen in the social network patterns identified, active mentors can drive team interaction. However, in contrast with other findings in the literature, the degree centrality and reciprocity do not affect the team interactional dynamic (Jan & Vlachopoulos, 2019). Regardless of the directionality of the predominant interaction, if there are active members in the team or the mentors are motivating, these individuals are the key to generating more interaction and enhancing online learning experience of students.

Ideally, both mentors and all students should be active, but having at least one or two more active students, can raise the team dynamic. Once some students are willing to share their experience and give timely responses, it can stimulate others to join. Continued encouragement of active members and mentors can promote a positive team dynamic. In terms of degree centrality, the observation that no pattern of interaction was superior to the others suggests that a single leader is not always necessary to for the team to be effective.

This study suggests that interactions will occur most naturally when students are doing what they feel is useful such as maintaining social support with each other and their mentor. In order to be accepted, learning initiatives such as linking learning with experiential activities will need to be less formal and integrate more smoothly with students' demonstrated desire for social support and interest to share experience. In addition, attention to team formation and ensuring opportunity develop team cohesion would be essential as students in the FGD, commented that when there were members they do not know well, it will be a hindrance for interaction. As the *connect*ed* is one of the graded components of the Enrichment Year, we observed that the assessment could serve as an external motivator encouraging students to contribute to the work and support their team. However, it could also have a negative impact as it is perceived as an additional burden and may pressure some students to participate for the sake of participating and doing so in an inauthentic way.

V. CONCLUSION

The online virtual community, *connect*ed*, to support experiential learning for medical students is still at an

early stage. Features of *connect*ed* that facilitated learning and personal growth included a focus on student support and sharing especially with multimedia, less structured interactions, and teams with active members and/or mentor. It is important to note that interaction does not equate to learning (Jan & Vlachopoulos, 2019), and so the use of an online network that adopts these features may better support learners but the effectiveness of achieving formal learning outcome should be further studied. We will continue to modify and evaluate the functionality of the *connect*ed* community to ensure it is fit-for-purpose to support students' needs and learning.

Notes on Contributors

Pauline Luk and Julie Chen contributed to the design and implementation of the research, analysis of the results and writing of the manuscript. PL drafted the manuscript, and JL edited and contributed to the intellectual content of the manuscript and provided overall supervision of the project. Both authors approved the final manuscript.

Ethical Approval

This research received approval from the HKU Institutional Review Board (UW18-121). Consent was obtained from participants for the research study.

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Declaration of Interest

The authors report no conflicts of interest.

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Appendix 1A: Grading Rubrics for Online Work

	Exceeds Expectations	Meets Expectations	Below Expectations
Participation			
Presence	Active online presence. Frequently participates in discussion, by posting replies, comments, and new content.	Regular online presence. Regularly participates in discussion, by posting replies, comments, and new content.	Minimal activity. Infrequently participates in discussion, with limited posting of replies, comments, or new content.
Quality of discussion	Introduces, elaborates on or adds new ideas, insights, and original triggers to enrich the discussion. Links topic with personal and others' experiences. Summarizes and synthesizes information coherently. Makes significant contribution to the collective understanding of the group.	Sometimes introduces new ideas, insights, or triggers to the discussion. Usually links topic with personal and others' experiences. Tries to summarize and synthesize information/ discussion. Makes adequate contribution to the collective understanding of the group.	Rarely introduces new ideas, insights, or triggers to the discussion. Little linkages to personal or group's experiences. Contributions are mostly superficial and lacking in analysis or critique. Makes minimal contribution to the collective understanding of the group.
Engagement	Creates an engaging and positive online environment. Demonstrates interest and stimulates others' interest. Encourages others to think more deeply and to elaborate on their posts. Provides appropriate and encouraging feedback.	Contributes to an engaging and positive online environment. Demonstrates interest and tries to stimulate others' interest. Attempts to motivate discussion and deeper thinking. Provides appropriate and encouraging feedback.	Demonstrates minimal interest. Replies tend to be close-ended and generally do not promote continued discussion or deeper thinking.
Professionalism			
Respect	Always uses appropriate language and tone when interacting with others.	Generally uses appropriate language and tone when interacting with others.	Uses inappropriate language or tone when interacting with others and/ or fails to recognize or respond when given feedback on this.
Responsibility	Takes significant ownership of personal and the team's work. Completes required work promptly. Is always prepared and dependable.	Takes adequate ownership of personal and the team's work. Completes required work on time. Is usually prepared and dependable.	Takes minimal ownership of personal or team's work. Needs repeated prompting to complete work or to complete it on time. Insufficient preparation or lack of dependability affects the progress of the team.
Reflectivity	Engages in self-reflection and is aware of own limitations. Seeks avenues for improvement and for improvement of the team. Graciously accepts feedback.	Generally engages in self-reflection and is generally aware of own limitations. Some effort to seek avenues for improvement. Graciously accepts feedback.	Minimal effort towards self-reflective practice. Limited awareness or insight into own limitations. May be reluctant to seek or accept feedback.
TOTAL SCORE (0-10 Marks)			

Comments (mandatory if below expectations in any domain)

Appendix 1B: Grading Rubrics **for Team Impact Presentation**

	Exceeds Expectations	Meets Expectations	Below Expectations
Content			
Preparedness & organization	Well prepared and organized. Coherent and shows logical progression. Clearly presented content which is easy to understand.	Adequately prepared and organized. Generally coherent with logical progression. Clearly presented content which is generally easy to understand.	Insufficiently prepared. Somewhat organized with fair coherence and some logic to the progression. Lacks some clarity that makes the message difficult to understand.
Insight & reflective thought	Makes extensive clear connections between learning experience of all team members and attributes of a doctor/ university graduate. Draws on relevant experience. Shows evidence of reflection and insight. Authentic and impactful message.	Makes clear connections between learning experience of all team members and attributes of a doctor/ university graduate. Draws on relevant experience. Shows evidence of reflection and insight. Meaningful and authentic message but may not be strongly impactful.	Attempts to make connections between learning experience of all team members and attributes of a doctor/ university graduate but the connections are vague, incomplete and/or unclear. Draws on relevant experience with insufficient reflection or insight. Message is superficial and not strongly impactful.
Originality	Selects and organizes content in a creative and original way.	Standard or conventional content with some attempt to select and organize it in a creative way.	Standard or conventional content that is cliché.
Sub-score for content (maximum 30 marks)			
Presentation			
Communication	Uses appropriate, articulate and fluent language to deliver a clear message.	Use appropriate and fluent language that generally delivers a clear message.	Uses language that is inappropriate or insufficiently fluent such that the message is unclear.
Visual Appeal	Very engaging presentation. Innovative and effective use of the visual medium selected. Excellent technical quality.	Generally engaging presentation. Effective use of the visual medium selected. Acceptable technical quality.	Minimally engaging presentation. Visual medium selected not used to its potential. Technical quality detracts from the message.
Teamwork	Meaningful contribution from every member of the team. Evidence of collaborative work.	Contribution from every member of the team. Some evidence of collaborative work.	Contribution from most, but not all, members of the team. Little evidence of collaborative work.
Sub-score for presentation (maximum 30 marks)			
Total Score (maximum 60 marks)			

Comments (mandatory if below expectations in any domain):

Appendix 2: Activities undertaken by students in 2018-2019

Activities	Number of Students	Local	Overseas	Total
Intercalation				197
Local		56		
Elective courses	17			
MRes(Med)	15			
Minor ¹	23			
MPH	1			
Overseas			141	
Exchange program(in 18 countries)	78			
Intercalated degree ² (U.K.)	48			
Visiting (U.K., U.S.A, Canada)	15			
Research				47
Local (in 14 clinical departments ³)		44		
Overseas (U.K. & U.S.A.)			3	
Service & Humanitarian Work				58
Local (in 12 NGO organizations) ⁴		27		
Overseas (in 8 countries) ⁵			31	
				302

¹ Examples of minor: Minor in Genetics and Genomics, Minor in Kinesiology etc.

² Examples of intercalated degree: BSc in Neuroscience (UBristol), MSc in Public Health (LSHTM)

³ Examples of research in clinical departments: emerging infectious diseases and novel microbe discovery (Microbiology), protecting the brain in experimental stroke (Ophthalmology)

⁴ Examples of local service & humanitarian work: Early intervention services for at-risk children, Community-based health education and health care services for female sex workers

⁵ Examples of overseas service & humanitarian work: Medical Volunteering Programme (Mongolia), Public Health Leadership: Service in Yunnan (China), Internship at WHO Western Pacific Regional Office (Philippines)

Appendix 3: Patterns and Levels of participations in teams

Pattern	Team	Mentor	Posts		Mentor	Comments		Mentor	Responses	
			Student Average	Level of participation		Student Average	Level of participation		Student Average	Level of participation
1	1	113	3.2	H	236	43.0	H	227	20.4	H
1	9	30	5.1	H	76	36.0	H	62	34.0	H
1	10	49	0.5	H	108	39.8	H	297	30.0	H
1	11	20	1.9	H	138	38.4	H	266	14.3	H
1	17	10	1.0	H	95	32.8	H	114	10.0	H
1	21	2	1.0	H	62	29.3	H	135	7.7	H
1	25	13	0.6	H	39	27.3	H	147	9.7	H
1	26	10	0.4	H	42	26.6	H	120	9.0	H
1	33	11	1.0	H	36	19.0	H	320	15.7	H
2	2	43	3.4	H	127	39.9	H	19	28.1	L
2	19	19	1.4	H	42	30.8	H	3	5.0	L
2	31	12	0.3	H	35	23.2	H	12	10.2	A
3	3	12	2.9	H	19	41.3	L	20	24.6	A
3	7	4	1.0	H	14	41.4	L	20	9.8	A
3	14	8	1.6	H	25	35.3	L	14	16.1	A
3	18	10	1.3	H	9	32.5	L	19	20.3	A
3	28	5	1.1	H	2	23.7	L	3	9.9	L
4	4	11	0.7	H	27	43.3	L	90	14.7	H
4	6	8	1.1	H	29	41.9	L	149	29.1	H
4	12	8	1.0	H	34	38.4	L	67	10.1	H
4	13	20	0.5	H	18	37.8	L	148	31.0	H
4	15	8	1.4	H	10	32.6	L	128	10.3	H
4	20	10	0.5	H	5	31.2	L	23	11.2	H
4	23	11	0.4	H	22	28.3	L	61	9.9	H
4	27	12	0.4	H	18	25.0	L	92	10.0	H
4	29	3	0.7	H	7	23.7	L	18	3.7	H
5	5	18	1.5	H	36	42.0	A	3	14.3	L
5	8	8	1.5	H	38	40.3	A	151	44.8	H
5	16	4	0.8	H	35	33.2	A	110	16.2	H
5	22	14	0.8	H	30	28.5	A	100	11.3	H
5	24	8	2.0	H	24	26.3	A	10	9.0	A
5	30	20	1.5	H	29	22.8	A	65	10.3	H
5	32	5	0.7	H	17	20.8	A	4	8.3	L

H=high participation compare to team average; A=average participation that mentors are having similar amount of participation as students; L= low participation compare to team average.