

## **A Pilot Study for Case-Based Learning Among Undergraduate Students in Global Health**

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### **Abstract**

In this pilot study, students in a 4th year undergraduate course in Global Health at the University of Ottawa were exposed to Case-Based Learning (CBL) for the first time; and their experiences were assessed via an online survey. Though the response rate was poor (21%), respondents indicated overwhelmingly that the CBL experience was enjoyable, educational and appropriate for the subject. Aside from cost, the major challenge was harmonizing student experiences across the discussion groups, which may be addressed by better leader training. Given its innate opinion-based and interdisciplinary nature, Global Health is an appropriate subject area for the application of CBL to undergraduate teaching, and expansion of this intervention must include a wider selection of cases and greater harmonization of facilitation methods and leader training across groups.

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### **Introduction**

Since first pioneered at McMaster University four decades ago, problem-based learning (PBL) has spread to over 60 medical schools worldwide [1], and with it has come greater explorations of its close relative, case-based learning (CBL). The two educational techniques have proven sufficiently effective to spread to domains outside of Medical school, including classes in Engineering [2], Law [3] and a variety of undergraduate programs [4].

While its virtues are spreading across the sphere of pedagogy, the extent to which CBL can be applied to the undergraduate teaching of Global Health has not been explored in the literature. As a field of study, Global Health draws from the subjects of Epidemiology, Medicine, History, Economics and a number of other fields. It is therefore necessarily complex, and there are no standard methodologies or models for teaching it that are universally acknowledged. Global Health therefore does not lend itself to a purely didactic approach, since issues to be explored are typically nuanced by competing opinions, professional biases and political stances. Thus, approaching the teaching of Global Health from a case-based approach seems like an ideal tack.

At the University of Ottawa's bilingual (English/French) Interdisciplinary School of Health Sciences, the sole Global Health course is a very popular 4th year offering, typically attracting 70-100 students per year. Several discussions have occurred at the faculty level regarding the possibility of employing more small group learning approaches, featuring a case-based approach, in a variety of classes. However, the major barrier to implementing CBL regularly is financial: the cost of case preparation, salaries of session leaders, and the cost of space allocation for conducting the sessions.

The one-day pilot study described herein was conducted to explore student reactions as a basis for a

future expanded research project on using CBL for Global Health teaching. The intent of such an expanded study would be to inform an eventual administrative decision on whether to invest in regular CBL sessions for this and related classes.

## Methods

As a pilot study, in the 2009-2010 school year, the 77 students of the 4<sup>th</sup> year Global Health class of the bilingual Interdisciplinary School of Health Sciences at the University of Ottawa were given a mandatory one day CBL session, held on a weekend. Students were divided into six groups of 10-14 participants. Each group was led by a single individual, chosen from two professors, two graduate students and two high-performing undergraduate students. The two professors had previously received formal small group facilitation training by the Faculty of Medicine. The remaining leaders were given a brief overview of objectives and methodology.

The case was given to students a week in advance, and consisted of a discussion of the current (2010) famine in Northern Uganda. The objectives of the case were: (1) to understand some of the political and social barriers that impede the addressing of large scale famine; (2) to become aware of the health impacts and management challenges of famine and drought; (3) to become aware of some of the opposing arguments relating to the provision of food aid; and (4) to become aware of the increasing importance of globalization, cash crop economies, poor political management and Climate Change on large scale global health events, such as African famines.

Seven internet links were included to start students' search for more information relevant to the resulting discussion of the case. The discussion questions meant to help guide exploration of the issue are included in Appendix 1.

After the session, a voluntary online survey was sent to all students, hosted by SurveyMonkey.com. Ethics approval for this study was obtained from the University's research ethics office.

## Results

There was a low response rate, with only 16 completed surveys (21%), 15 of whom answered every question. All respondents were female (the class is 73% female), and none had ever experienced PBL or CBL before. One student was enrolled in the Nursing program, while all the others were registered in the undergraduate Health Sciences program. While the course is a 4<sup>th</sup> year class, one respondent was in her 2<sup>nd</sup> year and three were in their 3<sup>rd</sup> year of their programs. And though the program is bilingual, 12 (75%) of respondents claimed their mother tongue to be English. The remaining students individually reported Arabic, French, Urdu and Somali as their first languages.

Responses to the quantitative questions are summarised in Table 1, while a sample of the qualitative responses is given in Table 2. Key findings include that all respondents felt that the CBL session was either "moderately" or "quite" worthwhile. Eleven respondents (73%) would have preferred to receive a lecture on the topic prior to endeavouring into CBL. And most importantly for the objectives of this study, 11 respondents (73%) felt that CBL in small groups was a superior experience to a traditional lecture format. (Only one felt that there was no difference in preference between the two formats.) Additionally, 9 (60%) reported that CBL was superior to a less structured, small group dynamic. A majority of 9 (64%) would have liked to have had more CBL sessions in the year. They recommended the following topics: maternal care, health education in developing countries, and strategies for addressing epidemics.

	Response Percent	Response Count
All things considered, how motivated do you feel to participate in the CBL sessions?		
Very motivated	51.1	13
Moderately motivated	46.7	12
Not motivated	2.2	1
Do you prepare for the CBL sessions before the day of the event? (i.e. reading the case or doing additional research)		
Yes	51.1	13
No	48.9	12
All things considered, do you enjoy your CBL experiences?		
Yes	46.7	12
No	53.3	14
Don't know	0.0	0
Regarding the case, "Hemorrhagic fever in Uganda", how appropriate are the facts for this class?		
Very appropriate	46.7	12
Moderately appropriate	53.3	14
Not appropriate	0.0	0
Regarding the case, "Hemorrhagic fever in Uganda", how appropriate are the facts for CBL?		
Very appropriate	55.6	14
Moderately appropriate	44.4	12
Not appropriate	0.0	0
How well prepared did you feel to participate in the CBL discussion?		
Extremely well prepared	4.4	1
Moderately prepared	73.3	19
Extremely not prepared	22.2	6
How much do you think you participated in the CBL discussion?		
A great deal	46.7	12
Moderate participation	53.3	14
Minimal participation	0.0	0
Do the members in the CBL sessions would you have preferred to have a discussion before or after the topic or background presentation?		
Yes	55.6	14
No	44.4	12
No preference	0.0	0
Do the students following the CBL sessions would you have preferred to have received a lecture on the case topic covered by the CBL?		
Yes	11.1	3
No	88.9	23
No preference	0.0	0
As a result of the CBL, how much do you feel you learned about the topic relating to Hemorrhagic fever in Uganda?		
Learned a great deal	46.7	12
Learned a moderate amount	53.3	14
Learned very little or nothing	0.0	0
For the topic of "Hemorrhagic fever in Uganda", how do you feel the CBL format compares to a traditional lecture/discussion format?		
CBL had a superior experience	55.6	14
A better experience overall than the lecture	44.4	12
There was no difference between the two	0.0	0
For the topic of "Hemorrhagic fever in Uganda", how do you feel the CBL format would compare to a lecture/discussion and group discussion?		
CBL is better than traditional small group discussion	55.6	14
Both group discussion is better than CBL	44.4	12
No preference	0.0	0
Which do you prefer to have the first presentation for CBL? (This question does not apply if you are not a student)		
A student presentation	55.6	14
An instructor/lecturer presentation	44.4	12
A graduate student (i.e. teaching assistant)	0.0	0
A graduate student (i.e. teaching assistant)	0.0	0
A fellow undergraduate student	0.0	0
Which of the following skills did your discussion teach you?		
Research	55.6	14
Communication	55.6	14
Education	55.6	14
Problem Solving	55.6	14
Teamwork	55.6	14
Writing	55.6	14
Public speaking	55.6	14
Organization	55.6	14
Management	55.6	14
Leadership	55.6	14
Do you expect that in the another CBL session in this class in this school year?		
Yes	55.6	14
No	44.4	12
Do the CBL sessions were not mandatory and you did not receive credit for the course or CBL days allowed?		
Yes	46.7	12
No	53.3	14
How do you feel about doing the CBL sessions as a student?		
Very interesting and enjoyable	55.6	14
Moderately interesting and enjoyable	44.4	12
No preference	0.0	0

Table 1 - A sample of responses from Global Health students in CBL

Table 1 – Summary of responses to the online survey on CBL for Global Health

Comment
1- "I really thought the experience was great. I do hope that we can have more of the same in the future."
2- "It seemed like a waste of time. All the people in my group did was regurgitate information from the articles we were supposed to read, and some people evidently did not read the articles at all. It would have been nice to go a little past the article content, and to also require people to read the articles first. I did not participate much because it seemed silly to simply restate everything that I had just read the day before. We also went off-topic for a very long time, with no effort made by the [leader] to put us back on track."
3- "I loved it, learned a lot and would love to have the experience again!"
4- "Must have more in future"
5- "I underestimated just how great it would be."

Table 2 – A sample of comments from Global Health participants in CBL

## Discussion

Our low response rate makes generalizations problematic. However, some wisdom can be extracted from these data. For the objectives of this study, our results point to an innate value in CBL for teaching Global Health. Of course, it is quite possible that only those most moved by the experience were motivated to complete the questionnaire, thus biasing our results toward the valuing of CBL.

Case-based learning is innately a qualitative process. Some subjects, such as hard sciences, and even some topics in Medicine, lend themselves to definitive solutions to well defined problem scenarios. The imprecise and opinion-based nature of Global Health makes it theoretically an appropriate subject for the CBL treatment. However, its CBL's qualitative nature that also presents its challenges, particularly with respect to standardizing experiences across student groups.

According to our admittedly limited data, while the overwhelming majority of students reported valuing the CBL experience, responses indicated that one group suffered from poor leadership, poor participation and lack of discussion focus. Given the need to harmonize experiences of students across all groups within a given class, for CBL to be regularly incorporated, more attention needs to be placed on the training of session leaders. It is also possible that as students become more used to the format, expectations will become clearer, and experiences more similar.

It is not surprising that respondents reported such a diverse array of subjects touched upon during their discussions, as such diversity is the essence of the subject of Global Health. This finding reinforces the value of CBL in accessing the innate complexity and interdisciplinary nature of a course that would

otherwise have to rely on more direct, didactic methods of teaching. The power of CBL to leverage inter- and multidisciplinary approaches has been discussed before, in such arenas as Nursing and public health training [5, 6]. However, we believe its relevance to Global Health, quite similar to public health, is particularly noteworthy. It is reassuring that most respondents preferred this format to both lectures (73%) and unstructured small group discussion (60%).

Our results also indicate that an integrated medical school model is worth pursuing; specifically, a format of introducing a specific topic in a traditional lecture format (preferred by 73% of respondents), engaging in CBL, then following-up on the same topic with an additional lecture (preferred by 53% of respondents). This wrapping approach would address all students' individual learning styles, would ensure that all students are exposed to essential core materials, and would reinforce the key lessons of the experience. However, such an expensive and time-intensive strategy cannot be applied to all topics in a given class, and must be reserved for special topics that either define the discipline or convey specific learning objectives that are the most relevant to the overall course.

As observed by White in 1996 [7], "content laden lectures delivered to large enrolment classes typify science courses at most universities and many colleges." The Global Health class in which this study was set suffers from unusually large enrolment, hobbling its ability to explore nuances in the field. The goal for pedagogy at this level should be complex thinking, intellectual leadership and self-driven inquiry, none of which are served by the traditional lecture, or even small tutorial formats. One of the defining traits of CBL in a small group format is that students accept the responsibility for their own learning [8], an element desperately needed for advanced work in all fields of multidisciplinary health sciences.

With sustained investment in the training and retaining of session leaders, the development of relevant multifaceted cases and efforts to maintain small group sizes, CBL can be a vital and effective format for the conveyance of the complex, current and interdisciplinary aspects of Global Health theory.

Discussion Question
1. What is the definition of "famine"?
2. What are the likely individual and population health impacts of prolonged famine? (Keep mind that there is also a water shortage)
3. What are the likely economic and social impacts of prolonged famine and drought?
4. How do famine and drought affect Uganda's ability to address its HIV/AIDS epidemic?
5. Where does most of Uganda's food typically come from?
6. What are Uganda's main crops?
7. What are some of the political consequences of a prolonged famine, both domestically and in relation to Uganda's international relationships?
8. What are the consequences of prolonged famine to other nations in the region?
9. What are the consequences for the rest of the world, especially Canada?
10. What are some possible motivations for the Ugandan government to deny the existence of the famine?
11. What solutions are available to the Ugandan government?
12. What barriers does the Ugandan government face in implementing such solutions?
13. What can and should the rest of the world do, especially Canada? What are the pros and cons of our potential actions?
14. What are the appropriate long term strategies for alleviating famine? What are the pros and cons and ethical considerations? (See resource #5 and #6 for a controversial view)
15. To what extent have global trends out of the control of Ugandans—such as market globalization and Climate Change—contributed to the situation?
16. How does a more thorough and multivariable discussion of famine in Uganda affect your personal feelings about your role as a consumer in an interconnected world?

Appendix 1: Discussion questions included in case titled, "Famine in Uganda".

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