Critical Thinking in Medical Education Missions

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Critical thinking, an essential skill for the transformation of medical knowledge into practice, should be a key component of medical education, even in cross-cultural training situations. Critical thinking is the use of purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference as well as the explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment was based. Critical thinking is important because the healthcare workplace and the science on which healthcare is based continue to advance and evolve. Those who teach healthcare cross-culturally may experience challenges in teaching critical thinking to cross-cultural learners, challenges in the areas of language/communication, cultural differences, customary education approach, and educator factors. The challenges may be identified, addressed, and overcome. Tangible means of implementing training in critical thinking include the use of questions and discussions during educational sessions as well as structured systems for reflecting on causes and treatment of medical conditions.

Key words: medical education, critical thinking, cross-cultural training

Introduction

Christians often provide cross-cultural patient care around the world, an activity referred to as "medical missions." Now, many Christians are involved in cross-cultural trans-national education of health care professionals, "medical education missions." In many settings, medical education can be a key component of international service, missions, and outreach. However, preferences for and styles of learning vary between cultures. In areas where professionals have tended to learn by rote memory, medical education missionaries can struggle to implement training that is based on critical thinking.

In many cultures, though, there is acknowledgement that basing medical practice on evidence leads to interventions that work, help people, and are associated with good outcomes. Determining how to apply scientific evidence in different settings requires a process of critical thinking. How, then, might evidence-based critical thinking appropriately be taught and implemented cross-culturally?

The comments in this article both informed and were informed by a workshop on critical thinking in medical education missions that involved approximately 80 medical missions personnel at the Global Missions Health Conference in Louisville, Kentucky, USA in November 2018. This article is presented now in an effort to foster ongoing discussion of the important topic of critical thinking in medical education missions.

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What is Critical Thinking?

There are numerous definitions of critical thinking that have been presented over the years. Each definition has its own emphasis. Simplistically, Alfaro-LeFevre[1] defines critical thinking as controlled and purposeful, using well-reasoned strategies to get the results you need. Critical thinking is not something new, and a review of the term and definitions can be helpful.

Critical thinking can be traced to the thinking of Socrates (469-399 BC), the great Greek philosopher 2,500 years ago. Socrates is known for his deep questioning that probed into thinking before accepting ideas. More recently, Albert Einstein (1879-1955), a German-born theoretical physicist, is quoted as saying "Education is not the learning of facts BUT training the mind to think." Einstein also reportedly claimed that, "It's not that I'm smarter than other people, it's just that I stick with problems longer."[1]

The term "critical thinking" has its roots in the mid to late 20th century. The American Philosophical Association obtained a consensus statement from 46 experts on critical thinking in 1987.

> *We understand critical thinking to be purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference as well as the explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment was based.*[2,3,4]

Critical Thinking in Health Care

In 1992, schools of nursing were required to define critical thinking and to produce outcome assessments of students' increased competence in this skill for accreditation purposes.

In 2000, a consensus statement on critical thinking was developed by a panel of 55 nursing experts.[5] In 2013, another survey was done with 65 expert nurses that showed agreement that the critical thinking indicators were behaviors often seen in nurses that are critical thinkers.[1]

The 2013 survey[1] identified 22 characteristics and behaviors often seen in critical thinkers: self-aware, genuine/authentic, effective communicator, curious and inquisitive, alert to context, reflective and self-corrective, analytical and insightful, logical and intuitive, confident and resilient, honest and upright, autonomous/responsible, careful and prudent, open and fair-minded, sensitive to diversity, creative, realistic and practical, proactive courageous, patient and persistent, flexible, health-oriented, and oriented toward improvement (of self, patients, and systems).

This list of characteristics of critical thinkers is the ideal. No one is perfect. Characteristics vary depending on the specific circumstances and setting, such as comfort and familiarity with the people and situation at hand.

An ability to think critically is a combination of these characteristics, along with intellectual skills, Interpersonal and self-management skills, and technical skills.[1]

Why is Critical Thinking Important in Health Care?

Critical thinking is important because the healthcare workplace and the science on which healthcare is based continue to advance and evolve. No one can be expected to know, or even to rapidly access, all medical knowledge; care providers must be able to reason as they consider patient presentations, differential diagnoses, and treatment plans. Awareness of and access to information is vitally important, but care providers must be able to act upon that information in ways that are adapted to and appropriate for specific clinical situations. Each patient is unique, and care plans must also be unique. Checklists and algorithms can guide thought processes, but they are incapable of always fitting each complex patient's specific situation. With high patient acuity and demands on time, care providers need to be able to think through plans when it is not possible to consult sources of information.

Challenges in Teaching Critical Thinking Cross-Culturally

Those who teach healthcare cross-culturally may experience challenges in teaching critical thinking. Classifying these challenges can help educators to identify and address them in order to achieve effective cross-cultural teaching. The challenges may roughly be categorized into the areas of language/communication, cultural differences, customary pedagogy, and educator factors.

Language/communication

Teaching involves communicating thoughts and concepts. In looking at the importance of language to teaching, Baydak *et. al.* state that "Language is how people think."[6] Teaching critical thinking involves examining ways of thinking. Awareness of nuances of language and communication is thus important in teaching critical thinking cross-culturally. Challenges may arise when the teacher and the learner have different primary languages. The technical language of medicine adds a third layer of complexity. If a common language has been elected as the educational language that is not the primary language of a learner, the learner not only has to learn the concepts but has the added challenge of interpreting the language used.[7] In sharing or testing situations, the learner may fully understand but be hesitant to answer due to perceived language proficiency difficulties. These challenges extend to the language of the educational literature being used; there is a sparsity of healthcare professional educational literature in some languages. Finally, communication also involves nonverbal communication such as body language, gestures, intonation, and the use of silence. All of these may be used differently and have different meanings in different cultural contexts; effectively teaching healthcare cross-culturally includes an awareness of these differences.

Cultural differences

To identify and address the challenges posed by cultural differences, all parties involved must evaluate underlying assumptions, preconceptions, and expectations. Cross-cultural teachers and learners approach each other with preconceived ideas based on literature, previous similar experiences, societal stereotypes, and even outdated television programs.[8] Effective translation of ideas can occur when these preconceived notions are replaced by genuine relational knowledge in an educational exchange. This requires humility on the part of both teacher and learner to identify and examine their own and each other's preconceived notions. Introducing a different teaching or thinking style, such as critical thinking, may initially challenge culturally-held belief and value systems. Take, for example, one of the critical thinking indicators mentioned earlier, autonomous. Initially, this descriptor may challenge someone from a collectivist society. However, upon further examination, seemingly dichotomous characteristics such as autonomy/individualism/responsibility and collectivism/consensus/teamwork can be viewed as two sides of a coin, both necessary for thinking critically and providing healthcare. A seeming difference in values may actually be a difference in prioritization, with the same value being held by both cultures but at a higher or lower priority than other values.

Customary pedagogy

The third category of challenges to teaching critical thinking cross-culturally is the customary educational approach. In many areas of the world, customary educational approaches rely heavily on methods such as oral learning and rote memorization for reasons beyond the scope of this article but related to culture and language factors. Oral learning and memorization are both quite helpful and useful ways to learn and retain a large volume of information, such as when studying something like anatomy. However, introduction of the creative thinking and problem-solving skills necessary for the

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interpretative, analytical, and evaluative aspects of critical thinking may initially challenge the conventionally held educational paradigm. Cross-cultural learners may also be accustomed to a structured learning environment where the teacher is an expert authority who is not to be questioned and there is a single "right" answer.[9] Critical thinking in healthcare entails identifying and reasoning between multiple possible answers, for example when developing a differential diagnosis. Effective teaching and learning in healthcare utilizes the strengths of both a pedagogical approach focused on knowledge and information retention and a critical thinking approach focused on considered application of information.

Educator factors

Finally, factors related to the cross-cultural educator himself may pose challenges to teaching critical thinking cross-culturally. Educator factors include the teacher's motivation for teaching in a cross-cultural environment, preconceived assumptions as discussed earlier, and preparation. Teachers may elect to work in a cross-cultural setting for a variety of reasons, such as a service orientation, a desire to grow personally and professionally, and even a desire to enhance one's resume. Responsible teachers utilize self-reflection to identify their motivations and ascertain they are aligned with the purposes of their sending and receiving organizations. Teachers are accustomed to the responsibility of preparation. However, as Bovill *et. al.* note, there is a sparsity of training and support for transnational, intercultural teaching.[8] Gopal suggests preparation for teaching cross-culturally should address attitudes, knowledge including cultural self-awareness, and skills such as effective cross-cultural communication and contextualization.[10] Cross-cultural educators may need to be creative in seeking preparatory opportunities.

Identifying challenges in teaching critical thinking cross-culturally

The above classification can help educators identify and address challenges in teaching critical thinking cross-culturally. The first step in identifying any of the challenges is asking. Ask educators from within the culture how verbal and nonverbal communication is used and interpreted. Ask translators for insight into methods of communication and cultural nuances. Ask educators and learners from within the culture what the customary educational approach is, and ask oneself about motivation, preconceived assumptions, and preparation. The next step is observing and discussing: observe how learners interact with the communication and approach being used; discuss with learners and other educators how the educational approach being used may be different from one they are accustomed to and why. Other activities that aid in identification of challenges include orientation and seeking a cultural mentor. Finally, continue asking throughout the process of teaching critical thinking cross-culturally: ask for advice and feedback from peers, supervisors, and students.

Practical Ways to Teach Critical Thinking Cross-Culturally

Teaching critical thinking in a cross-cultural setting is an important part of effective global healthcare education. In many global settings, the primary method of learning is by rote memory. One colleague who did medical school studies in an Asian country, but then came to the United States and did an internal medicine residency, reported that the biggest difference for her in the residency program in the US was that she could make the correct diagnosis, but she could not tell you how or why she made the diagnosis. This points out why memorization of medical facts alone does not help a trainee apply the information in a day-to-day clinical setting.

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Participatory approaches to education encourage critical thinking and foster comprehension.[11] One of the ways we can encourage a trainee to use critical thinking is to start with a question. Tofade *et. al.* use Bloom's taxonomy pyramid of learning to help create questions appropriate for the learner's level of training.[12] The sometimes dreaded "why" question is a good one. Other ways are to ask open ended questions, get group participation, and have the participants do problem solving. Try to think of ways to stimulate their curiosity. When asking questions, be patient, pause, and wait for an answer.

There may be many reasons an audience will be reluctant to answer questions in a cross-cultural setting. Culturally, it may not be polite to answer quickly as it is perceived by peers that you are showing off or you consider yourself superior. If you are a visitor, senior professor or lecturer, the culture would be that a student would never ask you a question. There may be the concern that if the answer given is wrong, they would "lose face." Finally, if English is not the group's first language, it may be difficult or take them time to format an answer.

In a clinical setting, the skills required to do critical thinking include the ability to observe (history and physical), analyze, interpret, and evaluate the findings (differential diagnosis), so one can problem solve (select the correct diagnosis). The learner then has to make a decision on further workup (lab tests and x-rays, for instance) and treatment. The final step is for the trainee to be able to explain to the patient why he or she thinks the chosen diagnosis is the most likely and why the recommended therapy was selected.

In applying these skills, we want to help the trainee learn how to organize the information, so a presentation will be coherent and easy to follow. We want to encourage trainees to appropriately evaluate the data so they can come to the appropriate conclusion or diagnosis. Encouraging them to ask for help from their preceptor or peers will help them recognize their own limitations and teach a sense of humility and integrity. As they recognize their own lack of knowledge, they should be encouraged to go away and look up information (self-learning) which will help them learn the importance of life-long learning.

One method to practice critical thinking skills in clinical situations is a presentation technique called SNAPPS.[13] It will help the learner to integrate experience and learning in the clinical setting and encourage shared responsibility between teacher and learner. It will help the teacher to focus on 'teachable moments". The acrostic SNAPPS stands for: 1) **S**ummarize the case, 2) **N**arrow the differential to two or three relevant possibilities, 3) **A**nalyze by comparing and contrasting the differential diagnosis orally, 4) **P**robe the preceptor by asking questions for more information, 5) **P**lan jointly with the preceptor for treatment of the patient, and, 6) **S**elect an issue for self-directed learning.

A second method to teach critical thinking would be to use small group participation. An example of this is described by McLaughlin and Pfister in teaching African medical students ethical decision-making skills using case-based small groups.[14] The course started with a two-hour, interactive didactic lecture on ethical principles and application. They then developed 10 case studies relevant to the local rural African context. Groups of 4-5 students were assigned a scenario and then given several days to evaluate and analyze the case. The groups reconvened, and each group was given 15 minutes to present their findings and conclusions, followed by 15 minutes for questions from their peers and the faculty. The process was student-led, but faculty facilitated the case discussion.

An example of one scenario used to bring out the ethical aspects of autonomy and beneficence is as follows:

"Who decides?" A mother of 8 children is hospitalized for a cesarean section for baby #9 while baby #8 is hospitalized for severe, acute malnutrition due to an inadequate food supply at home. The mother agrees to have a tubal ligation, but the father refuses not for religious reasons, but because he says

that "a large family is the truest blessing." The mother asks you secretly to do the tubal ligation anyway and to not inform the father. What do you do?[14]

By using scenarios from the local cultural context, the course is made relevant to the students' life experiences and their future practice as physicians. In contrast to Western culture, the African culture is patriarchal, collectivistic, and has a different view of the often-cited pillars of medical ethics - autonomy, beneficence, non-malfeasance, and justice. There would also be resource limitations, varied levels of professional expertise, and a different Christian worldview even though it may be in a predominately "Christian" country.

What the authors found was that the students had lively and interactive discussions but could still discuss their disagreements. It helped them improve their ability to think critically about ethical principles in their local context.

The expatriate faculty found they needed to construct scenarios which would force the students to make a difficult decision. It was important that the faculty facilitated the discussion to allow for disagreement to occur. Sometimes, it was necessary to propose slight permutations to see if this would change the group's opinions.

There are also special challenges when teaching cross-culturally, especially if the teachers and learners do not share the same primary language. One needs to speak clearly and slowly, using more basic or straight forward, not nuanced, words. We must learn to understand the silence and absence of questions, or discussion may reflect respect and the local learning style. Also as mentioned earlier, answering in a non-primary language can add to a trainee's complexity and anxiety. Frequently, "less can be more" by focusing on one to three critical learning points.[15]

Finally, we need to adapt to the local educational culture.[16] When it comes to rote memory versus critical thinking, we have to be careful not to "throw out the baby with the bathwater." Cultures with oral traditions have a better ability to memorize.

In medicine there are certain things that require memorization, so we need to be careful and not denigrate or diminish these skills. We need to figure out ways to add critical thinking to learners' skill sets, as McLaughlin and Pfister did in the previous example[14] by helping trainees apply their learning in a practical clinical setting and making them better health care professionals.

Learning Points for All of Us

Rote memory is not bad. In fact, it is commendable and valuable when one can amass and recall a wealth of factual information. Good thinking, though, is multi-faceted. Good thinking involves gathering a knowledge base, thoughtfully using intellectual skills, demonstrating an ability to communicate, and implementing technical skills. Critical thinking might complement mobilization of many aspects of intellectual life to better serve patients and populations.

In the current era, in order to deal with nuanced clinical situations as medical knowledge is expanding to dizzying degrees, there is great value in supplementing rote memory and other learning techniques with critical thinking. It is challenging to teach critical thinking in areas where the technique is new, and good educators will face and overcome those challenges.

Good teachers will explore their own obstacles as they teach critical thinking. They will see if they, too, suffer from challenges of culture (what one thinks) and language (how one thinks). Frustrated teachers need to explore the sources of their frustrations rather than merely blaming the learners for not learning well. Good teachers are humble, and they learn along with their students. Good teachers model good learning by letting their students know what and how they are thinking and what and how they are learning.

Questions, especially "why" and "how" questions, can stimulate thought. The use of programmed techniques and discussion of scenarios can also be useful. Educators will find that their trainees learn to better practice medicine when

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educators can think about the value, challenges, and techniques of critical thinking while implementing specific strategies to help learners think critically.

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