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Short Communication

Critical thinking education for dental schools in Asia: Perceptions of educators

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Abstract Teaching competence in critical thinking is an important element of undergraduate dental curricula. The pedagogy for critical thinking education in Asia requires further discussion and neither the current situation nor the possible challenges are widely known from the perspectives of dental educators. Therefore, seven educators from four countries gathered online in the summer of 2021 to share the current situation and possible challenges. All the participants considered “critical thinking” was “important” (43%) or “very important” (57%), however, 86% mentioned that they faced challenges in delivering education in critical thinking. The challenges to delivering critical thinking education were insufficient time in the curriculum and lack of human resources; lack of information on appropriate teaching methods for the student population; and no established methods of assessment. How to teach and assess critical thinking therefore requires more brainstorming, and raising the awareness of educators to implement this education might be necessary.

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Introduction

Teaching competence in critical thinking is an essential element of contemporary undergraduate dental curricula and has been placed at the top of the list of competencies by the American Dental Education Association,¹ noted as one of the primary outcomes in a document published by the General Dental Council in the United Kingdom,² and was emphasized in the “competencies of the new general dental practitioner”, issued by the South East Asian Association for Dental Education.³ Moreover, there is a recognized need for Asian schools to provide critical thinking education. What has been termed “mindless education”, is likely to result in a narrow perspective and is a typical feature of rote learning.⁴ There is therefore a drive to “move from learning what to think to learning how to think”.⁴ However, critical thinking disposition, skill acquisition and development require time,⁵ and when critical thinking teaching should be implemented in the curriculum, how long this should be, how to teach it, and also how to assess it, requires further discussion.

Furthermore, since cultural differences will influence the pedagogy,⁶ and students’ disposition to critical thinking may vary according to a dental school’s population,^{7,8} it is important to establish a learning strategy appropriate to the student population. Although research on critical thinking education has been conducted, there is a paucity of data from Asian schools in the dental field and neither the current situation nor the possible challenges are well known from the perspectives of dental educators. The pedagogy around fostering soft skills is still to be developed in some countries and more discussion and research particularly among the educators are needed. Therefore, the aim of this project was to determine the perspectives of dental educators in different countries through online sessions in order to understand the current situation and the possible challenges regarding the delivery of critical thinking teaching in their dental schools.

Materials and methods

Online sessions involving seven educators from five dental schools in four different countries: Asia (Thailand; Vietnam); Europe (UK) and North America (Canada): took place in the summer of 2021 to grasp the current situation on critical thinking acquisition in the dental curricula of their schools and also to elicit the challenges. The seven educators held responsibilities for undergraduate curriculum development and/or delivery with their respective faculties. The educators were first asked to complete an online opinion gathering form and then participate in an online discussion if available. The online form consisted mainly of four questions; selecting one of three critical thinking definitions most related to their understandings; how important the participants felt competence in critical thinking is (and the reasons why); whether the participants’ dental schools have any subjects/courses to teach critical thinking skills; and the challenges in fostering critical thinking education (free comments could be added).

This study was approved by the Dental Research Ethics Committee of Tokyo Medical and Dental University (No. D2020-009).

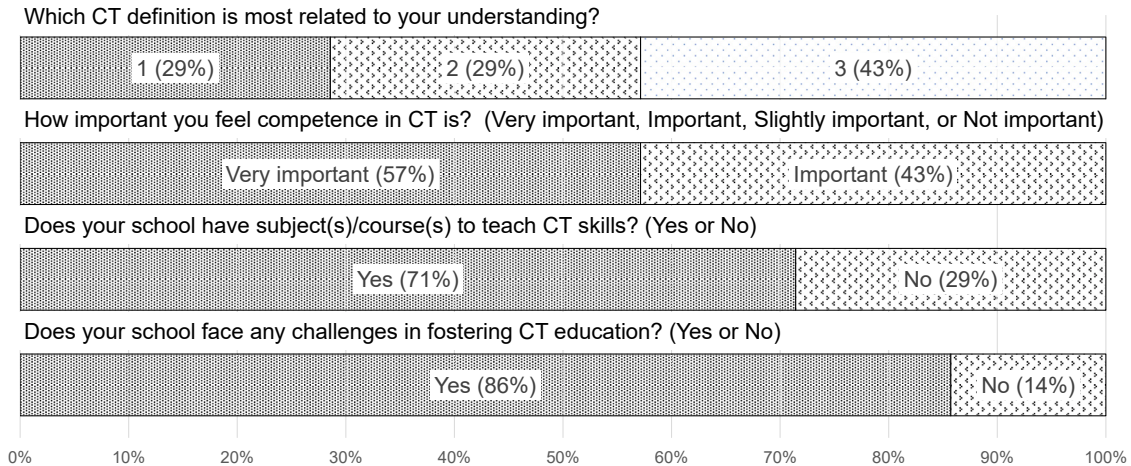
Results

Regarding the three critical thinking definitions, 29% of the participants selected: “*Purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological or contextual considerations upon which that judgment is based*”,⁹ 29% selected “*the ability to think critically involves three things; an attitude of being disposed to consider in a thoughtful way the problems and subjects that come within the range of ones’ experiences, knowledge of the methods of logical inquiry and reasoning, and some skill in applying those methods*”,¹⁰ and 43% chose “*the process of assimilating and analyzing information; this encompasses an interest in finding new solutions, a curiosity with an ability to admit to a lack of understanding, a willingness to examine beliefs and assumptions and to search for evidence to support these beliefs and assumptions, and the ability to distinguish between fact and opinion*”.¹ All the participants acknowledged that “critical thinking” was “important” (43%) or “very important” (57%), and 71% of them mentioned that their school had a subject(s)/course(s) to teach critical thinking skills. Of the participants, 86% mentioned that they faced challenges in fostering critical thinking education. The results from the online opinion gathering/discussion and the free comments are shown in Fig. 1 and Table 1.

Discussion

There is no single definition of critical thinking in dental education, however, competence in critical thinking is imperative for healthcare professionals. In order to begin to assess how critical thinking was viewed and taught in different dental schools throughout the world, seven educators from five dental schools in four different countries were approached. Although the educators’ dental schools were in countries with either predominantly “Asian” or “Western” cultures, it could be inferred from the results of the online opinion gatherings and discussions that all the dental educators in this study considered critical thinking education to be important. Critical thinking skills could also enhance academic performance, however, there were challenges in three broad areas to fostering critical thinking education.

The first challenge to delivering teaching in critical thinking is around education and resources. The educators reported that teaching these “soft skills” requires both time and trained staff, and not only was there limited time within their dental curricula but there was a shortage of appropriately qualified staff. This could be because the number of educators who could actually deliver teaching in critical thinking might be low. Moreover, it was mentioned that while the need to teach critical thinking is appreciated, if the educator did not have the authority to set a relevant module, establishing a specific course for teaching critical thinking was difficult. Ideally, critical thinking teaching should occur at the beginning of a dental curriculum, as a disposition toward critical thinking requires time for students to reflect and thereafter, students could improve their critical thinking skills overtime.^{5,7}



Note: Determination of CT definitions;
 1 = "Purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological or contextual considerations upon which that judgment is based."⁹
 2 = "The ability to think critically involves three things; an attitude of being disposed to consider in a thoughtful way the problems and subjects that come within the range of one's experiences, knowledge of the methods of logical inquiry and reasoning, and some skill in applying those methods."¹⁰
 3 = "The process of assimilating and analyzing information; this encompasses an interest in finding new solutions, a curiosity with an ability to admit to a lack of understanding, a willingness to examine beliefs and assumptions and to search for evidence to support these beliefs and assumptions, and the ability to distinguish between fact and opinion."¹¹

Figure 1 Online opinion gathering results for critical thinking (CT) acquisition in dental education.

Table 1 Free comments from educators in answer to the questions: "How important you feel critical thinking (CT) is" and "Challenges in fostering critical thinking (CT) education in the educator's school". Sentences in the brackets were the comments obtained in the online discussion. English was slightly revised to convey the meanings.

Country of Dental School	Free comments on the importance of CT and challenges
Thailand	<i>Importance:</i> It's important for co-creation of dental professionals. (In the future, more information and new situations might emerge. Therefore, skills in how to make judgments and CT are very important.) <i>Challenges:</i> (Consumes the lecturers' time and energy, challenging as it requires more time, human resources, and preparation, and we need to give detailed instructions to each student.)
Thailand	<i>Importance:</i> Nowadays there is a lot of false information. Complex problems arise. Therefore, the ability to critically think is a skill that every dental student must practice in order to be aware of false information. They should also think, analyze and synthesize various problems, that occur in the right and proper direction. (Information is not always the truth and the ability to process information is very important.) <i>Challenges:</i> We try to insert training CT for our students (even though there are time limitations.)
Thailand	<i>Importance:</i> Critical thinking is a core academic skill that teaches undergraduate and postgraduate students to question or reflect on their own knowledge and information presented to them. This skill is essential for students working on assignments and performing research. It's also an invaluable skill in many workplace scenarios. (How to collect and analyze data appropriately are important skills needed by healthcare professionals.) <i>Challenges:</i> (Time limitations, human resources shortages.)
Thailand	<i>Importance:</i> Critical thinking skills can also enhance academic performance. Students who know how to analyze and critique ideas can make connections across disciplines, see knowledge as useful and applicable to clinical performance and understand content on a deeper, more lasting level. <i>Challenges:</i> Lack of continuing professional development programs on critical thinking for educators.
Vietnam	<i>Importance:</i> CT is needed to survive in this huge world of information. (CT helps in handling and processing new knowledge and how to conduct research. Maybe we learned these skills many years ago, but we didn't consider it was "CT". Nowadays, this topic is popular. Not sure whether the faculty know what the word exactly means, but we teach it.) <i>Challenges:</i> The faculty themselves. (It is difficult for the faculty themselves to define the definition of CT. Teaching CT is also difficult (other areas of dentistry). They don't have time to acquire new teaching methods.)

(continued on next page)

Table 1 (continued)

Country of Dental School	Free comments on the importance of CT and challenges
UK	<p><i>Importance:</i> Unless we actively do something about it, there is a danger that the way we think maybe be biased or prejudiced. We should learn how to become open-minded, ask questions, assess information and communicate effectively with other people.</p> <p><i>Challenges:</i> Some members of staff appreciate the need the teaching critical thinking but unless these particular staff members are entrusted with the power to lead a Module or Unit that would allow them to introduce critical thinking teaching, then this teaching will not take place. (Staff members who can teach CT are needed. Do the faculty really know how to teach CT? It is not just asking questions.)</p>
Canada	<p><i>Importance:</i> Critical thinking should not oppose compliance to established standard of care.</p> <p>*The school did not face any challenges in fostering CT education.</p>

The second challenge concerns the pedagogy around critical thinking teaching. Problem-based learning (PBL), lectures and seminars in association with case studies were considered a possible method among the learning strategies used to teach critical thinking, however, one of the respondents mentioned that PBL was not used anymore. There is therefore no consistent pedagogy. In our session, critical thinking teaching was reported to be included in various areas of the dental curriculum in Asian dental schools such as; the theory and concept of public health to seminars, case studies, professional development, evidence-based dentistry, and research methodologies, but interestingly, the educators from western countries reported that they did not have specific courses for teaching critical thinking skills within their undergraduate curricula.

Cultural differences will influence the pedagogy,⁶ and students' disposition to critical thinking and so this is likely to vary according to a dental school's population.^{7,8} As such, while a course in critical thinking might be appropriate for one dental school, it might not be appropriate for another. This is because, not only the country within which a dental school is situated, could have a diverse population but the student population and therefore culture, is likely to vary among dental schools.⁷ Therefore, each school would need to choose a pedagogy, which is tailored to their students and therefore further discussion on what might be an appropriate pedagogy for critical thinking teaching would be valuable.

The third challenge is related to the assessment of critical thinking teaching. Although many subjects and courses encompassing critical thinking teaching have been implemented in dental curricula, how to align assessment of critical thinking teaching with learning outcomes is still subject to debate. In order to design appropriate learning outcomes and assess critical thinking teaching, it would be helpful if there was a consensus among educators on which is the appropriate definition of critical thinking in dental education. However, to date, no agreed method for assessing critical thinking acquisition in dental education has been published.

The importance of non-technical skills is recognised, however, these still need more attention in the field of dental education. Teaching and fostering critical thinking skills requires both time and human resources. Shortages of both human resources and time to deliver the teaching

have been observed in Asian countries, and a disparity in understanding the importance of teaching "soft skills" among the faculty staff was also noted.

How to teach and assess critical thinking in dental education therefore requires more brainstorming, and raising the awareness of educators to implement this education through for example, workshops for dental educators or faculty development, might be helpful in achieving this outcome.

Declaration of competing interest

The authors have no conflicts of interest relevant to this article.

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