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## Attitude of medical students for graphical recording technique as a critical thinking and creativity expression tool in medical teaching

Thira Woratanarat\*

**Woratanarat T. Attitude of medical students for graphical recording technique as a critical thinking and creativity expression tool in medical teaching. Chula Med J 2012 Jul - Aug; 56(4): 447 - 57**

- Background** : *Faculty of Medicine, Chulalongkorn University, has been approached by WHO SEARO to lead a mission of health mind teaching in verifying an innovative ways to train people to be promptly responsive to a situation of rapid socio-cultural changes. "Graphical recording technique" is a tool used in brainstorming session in business sector that might be of value to new generations of students.*
- Objective** : *To demonstrate the application of graphical recording technique in the curriculum of preventive medicine for 2<sup>nd</sup> year medical students.*
- Study design** : *Action research.*
- Setting** : *Faculty of Medicine, Chulalongkorn University*
- Materials and Methods** : *We instructed 290 second year medical students in a program of preventive medicine. Graphical recording technique, "Why and Then" principle, and PESTEL framework were introduced to the students in order to facilitate their thinking process to explain why the disease or the problem occurred, and what will be the impact. We divided medical students into groups of 10, and*

*assigned them to think about the problem of "obesity" and express their framework of critical thinking by graphical recording technique. Online anonymous evaluation was implemented after class.*

**Results** : *Ten out of 29 groups expressed the relationship of obesity problem in their medical student life, whereas 7/29 graphics dealt with the relationship of obesity and economic factors. Five out of 29 pictures were involved in the linkage between obesity and occupation, whilst the remaining expressed the roles of other socio-behavioral factors in the obesity and its impact. One hundred and fifty out of 290 medical students participated in the online evaluation. More than 75% of the students expressed that the teaching approach was highly useful in terms of enhancing group working skill, critical thinking skill on the linkage between social determinants and health problem, responsibility, creativity, and graphical explanation and expression skills.*

**Conclusions** : *Graphical recording technique is useful and well-accepted. It is an interesting approach for fostering students' holistic viewpoint.*

**Keywords** : *Graphical recording technique, medical student, creativity, critical thinking.*

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ธีระ วรรณารัตน์. ความคิดเห็นของนิสิตต่อการใช้เทคนิค Graphical recording เป็นเครื่องมือแสดงความคิดสร้างสรรค์และการคิดเชิงวิเคราะห์ในการสอนทางการแพทย์. จุฬาลงกรณ์-  
เวชสาร 2555 ก.ค. - ส.ค.; 56(4): 447 - 57

- เหตุผลของการทำวิจัย** : คณะแพทยศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย ได้รับการทาบทามจากองค์การอนามัยโลกให้เป็นผู้ดำเนินการสานต่อพันธกิจด้านนวัตกรรม การสอนแนวคิดด้านสาธารณสุขในโรงเรียนแพทย์ เพื่อให้ตอบสนองต่อการเปลี่ยนแปลงด้านสังคมและวัฒนธรรมอย่างรวดเร็ว เทคนิค Graphical recording เป็นเครื่องมือที่ใช้ในกระบวนการระดมสมองในภาคธุรกิจที่น่าจะมีคุณค่าในการนำมาประยุกต์ใช้สำหรับการสอน นิสิตแพทย์ในยุคใหม่
- วัตถุประสงค์** : เพื่อแสดงความคิดเห็นของนิสิตต่อการประยุกต์ใช้เทคนิค Graphical recording ในการสอนนิสิตแพทย์ชั้นปีที่ 2 รายวิชาเวชศาสตร์ป้องกัน
- รูปแบบการศึกษา** : การวิจัยแบบดำเนินการ
- สถานที่ทำการศึกษา** : คณะแพทยศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย
- ตัวอย่างและวิธีการศึกษา** : คณะผู้วิจัยได้สอนนิสิตแพทย์ชั้นปีที่ 2 จำนวน 290 คน ในรายวิชา เวชศาสตร์ป้องกัน โดยทำการสอนเทคนิค Graphical recording โดยอิงหลักคิดแบบ "ทำไม" และ "แล้วเป็นอย่างไร" และกรอบการ วิเคราะห์แบบ PESTEL ให้แก่นิสิตแพทย์เพื่อช่วยให้เกิดกระบวนการ คิดที่สามารถอธิบายปรากฏการณ์การเกิดโรคหรือปัญหาสุขภาพ รวมถึงผลกระทบที่เกิดขึ้น คณะผู้วิจัยได้แบ่งนิสิตแพทย์ออกเป็น กลุ่ม ๆ ละ 10 คน โดยมอบหมายงานให้แต่ละกลุ่มคิดวิเคราะห์ เกี่ยวกับปัญหาโรคอ้วน และแสดงผลการวิเคราะห์โดยใช้เทคนิค Graphical recording จากนั้นได้ทำการประเมินผลผ่านทางระบบ ออนไลน์แบบไม่ระบุตัวตนหลังจากเสร็จสิ้นการสอนของรายวิชา
- ผลการศึกษา** : นิสิตจำนวน 10 กลุ่มจากทั้งหมด 29 กลุ่มได้นำเสนอความสัมพันธ์ ระหว่างปัญหาโรคอ้วนในชีวิตของนิสิตแพทย์ ในขณะที่นิสิตจำนวน 7 กลุ่มจากทั้งหมด 29 กลุ่มได้เชื่อมโยงปัญหาโรคอ้วนกับปัจจัยทาง เศรษฐกิจ ส่วนอีก 5 กลุ่มนำเสนอเรื่องปัญหาโรคอ้วนกับอาชีพ และ กลุ่มที่เหลือได้นำเสนออิทธิพลของปัจจัยด้านสังคมและพฤติกรรมอื่น ๆ ต่อปัญหาโรคอ้วนและผลกระทบต่าง ๆ ที่เกิดขึ้น จากการประเมินผล

แบบออนไลน์พบว่านิสิตจำนวน 150 คน จากจำนวนทั้งสิ้น 290 คน ได้ร่วมตอบแบบประเมินผลการสอน นิสิตจำนวนมากกว่า 75% ได้ประเมินว่าวิธีการสอนนี้มีประโยชน์มากในแง่การกระตุ้นให้เกิดทักษะการทำงานเป็นกลุ่ม ทักษะการคิดวิเคราะห์เพื่อหาความเชื่อมโยงระหว่างปัจจัยทางด้านสังคมกับปัญหาสุขภาพ ฝึกความรับผิดชอบ กระตุ้นความคิดสร้างสรรค์ และทักษะในการอธิบายและนำเสนอผ่านรูปภาพ

**สรุป** : เทคนิค *Graphical recording* มีประโยชน์และได้รับการตอบสนองที่ดีจากนิสิตแพทย์ จึงน่าจะเป็นทางเลือกที่น่าสนใจสำหรับการกระตุ้นการคิดแบบองค์รวมด้านการแพทย์ได้

**คำสำคัญ** : *Graphical recording technique*, นิสิตแพทย์, ความคิดสร้างสรรค์, การคิดเชิงวิเคราะห์.

Medical schools are among important stakeholders of the supply chain in healthcare system. Since 2004, the Southeast Asia Regional Office (SEARO) of the World Health Organization (WHO) has organized several regional forums to ignite ideas for better fostering public health mind teaching in medical schools in order to strengthen health care workforces to overcome negative impacts from globalization and materialism.<sup>(1-2)</sup> On the one hand, globalization has brought about faster development of countries and exchanges of innovative technologies with better quality of health services provided to the population. On the other hand, many countries have been affected by huge socio-cultural changes in their population as well as in healthcare workforces, for instances, higher unnecessary consumption of costly health services and technologies, experiencing defensive medicine against lawsuits, and non-holistic practice among healthcare workers. Those changes, more or less, have widened the gap between healthcare providers and the patients, and resulted in changing of the relationship from doctor-patient to provider-customer pattern. Moreover, the phenomenon that has been frequently encountered in this era is the lack of skills in critical thinking for medical professionals by memorizing the answers in response to specific questions rather than understanding the real situation and exploring related contexts thoroughly for possible appropriate solutions before making the best decision.

Faculty of Medicine, Chulalongkorn University, is recognized as one of the best medical schools responsible for producing high quality medical graduates in Thailand, around 200 each year. We have been approached by WHO SEARO to lead

a mission of mental public health mind teaching to verify an innovative ways to train people to be promptly responsive to the situation of rapid socio-cultural changes. In response to this request, we found a technique called "Graphical recorder" as a tool used in brainstorming session or group discussion in business sector that might be valuable for new generations of students.<sup>(3-5)</sup> Hence, we hereby demonstrated the application of graphical recording technique in the curriculum of our preventive medicine for 2<sup>nd</sup> year medical students in 2011.

### Methods

We instructed 290 second year medical students of the Faculty of Medicine, Chulalongkorn University, in January 2011, in a course of preventive medicine. Graphical recording technique was introduced with the examples as well as various applications in health-related topics to establish the linkage between causation of the disease or health-related problem and the impact.

A "Why and Then" principle was introduced to the students in order to facilitate their thinking process to explain why a disease or problem occurs, and what will be the impact of the disease or problem. The "Why and Then" principle explanation was followed by the explanation of internal and external environment assessment techniques.

External assessment technique was presented by encouraging the students to use PESTEL framework: Political, Economical, Social, Technological, Environmental, and Legal, in order to help them for easier assessment in accordance with the "Why and Then" principle.

We divided all medical students into groups of 10, and assigned them to think about the problem of “obesity” using the “Why and Then” principle and express their critical thinking framework by graphical recording technique. Each group had two days were to finish their assignment, group presentations with feedbacks were arranged on the following day after submission.

Every student was encouraged to do a voluntary and anonymous evaluation after class on the Internet web using www.surveymonkey.com host service that provided independent web link address to the students.

The online evaluation form comprised a set of questions to assess how much the students think this teaching approach is useful in terms of enhancing group working skill, critical thinking skill on the linkage between social determinants and health problem, responsibility, creativity, and graphical explanation and expression skills. Every question was rated on the scale of 1 (not useful at all), 2 (minimally useful), 3 (moderately useful), 4 (highly useful), and 5 (Very

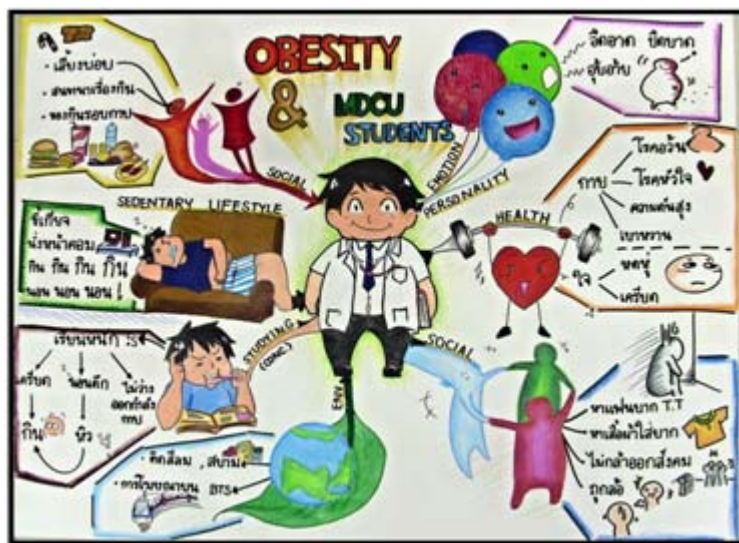
highly useful). The results from online evaluation form were analyzed by descriptive statistics.

**Results**

After a two-day assignment period completed, there were 29 graphical expressions regarding the topic of obesity with the linkage between its possible causes and impacts. Ten out of 29 groups expressed the relationship of obesity problem in their medical student life at Chulalongkorn University, whereas 7 out of 29 graphics dealt with the relationship of obesity and economic factors. Five out of 29 pictures were involved in the linkage between obesity and occupation, whilst the remaining (7/29) expressed the roles of other socio-behavioral factors in the obesity and its impact.

We hereby demonstrated some selected graphics in Figure 1 - 6.

Figure 1 showed the linkage between different lifestyles of the MDCU students and obesity with the consequences as interpreted by various social determinant factors.



**Figure 1.** Obesity vs medical students at Chulalongkorn University (MDCU).

Figure 2 pointed out possible linkages between different economic conditions and obesity with the consequences as interpreted by various social determinant factors.

Figure 3 demonstrated the linkage between various social attributes and obesity with the consequences on physical condition.



Figure 2. Obesity vs economics.



Figure 3. Obesity vs social attributes.



Figure 4 showed possible linkages between inadequate sleeping and eating patterns and obesity with the consequences on physical conditions.

Figure 5 demonstrated the association between different occupations and obesity with

potential impact on various social determinants.

Figure 6 demonstrated the linkage between MDCU students' lifestyles and obesity with the consequences on physical and mental conditions.



Figure 4. Obesity vs sleep patterns.

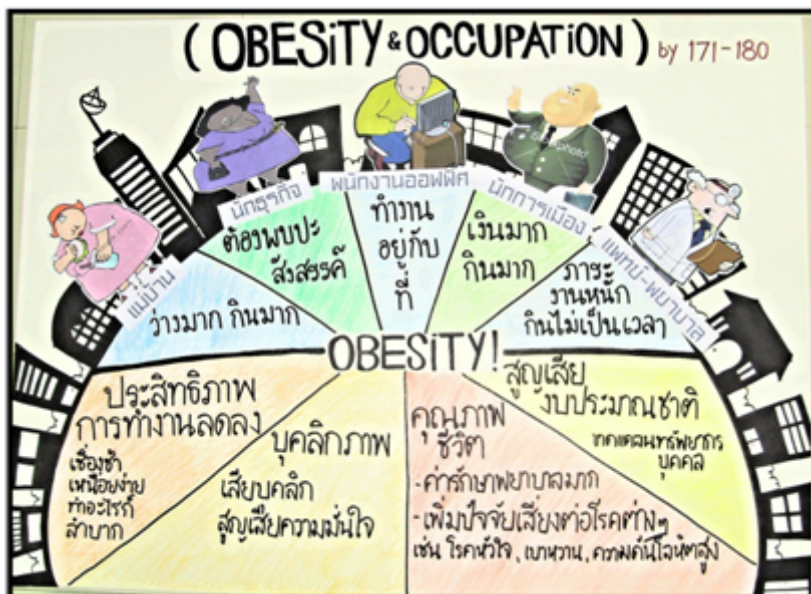


Figure 5. Obesity vs occupations.



**Figure 6.** Obesity vs medical students at Chulalongkorn University (MDCU).

After the class, 150 out of 290 medical students voluntarily participated in the anonymous online evaluation by utilizing [www.surveymonkey.com](http://www.surveymonkey.com) web services, which provided independent web link to the participants.

The results were summarized as in Table 1.

Nearly more than 75% of the students expressed that this teaching approach was highly

useful in terms of enhancing group working skill, critical thinking skill on the linkage between social determinants and health problem, responsibility, creativity, and graphical explanation and expression skills. Interestingly, less than 5% of the students considered this approach to be minimally useful or not useful in any of the questions.

**Table 1.** The summary of online evaluation for graphical recording technique teaching approach.

Topic	Rating score (number of raters)					Average rating
	1	2	3	4	5	
Group working skill	0.0% (0)	3.3% (5)	23.3% (35)	50% (75)	23.3% (35)	3.93
Critical thinking skill on the linkage between social determinants and health problem	0.0% (0)	0.6% (1)	33.3% (50)	49.3% (74)	16.6% (25)	3.82
Responsibility	0.0% (0)	2.6% (4)	24% (36)	48.6% (73)	24.6% (37)	3.95
Creativity	0.0% (0)	2% (3)	13.3% (20)	50% (75)	34.6% (52)	4.17
Graphical explanation and expression skills	0.0% (0)	6% (9)	16.6% (25)	54% (81)	23.3% (35)	3.94

## Discussion

Given the fact that social changes are at thundering speed, teaching process in medical schools are undoubtedly in critical situation to catch up with those surrounding alterations. Currently, the learning environment in most medical schools in Thailand is still passive, rather than proactive as reflected in lecture based sessions in the majority of the curricula. This type of teaching environment easily facilitates single-looped learning by memorizing fashion or answer-to-the-question way, but it seemingly complicates the real life situation by producing health professionals without adequate capability to holistically explore the root causes of the problem with their inter-attribute relationship. Consequently, without holistic knowledge, definite solutions in response to those causations, enabling, and facilitating factors, cannot be postulated, analyzed, and implemented in light of treatment, control, and prevention of the disease or health-related problems.

This study has pointed out another alternative teaching approach in order to strengthen the skills of critical thinking as well as creativity in medical school environment in a feasible and well-accepted way.

Perry M *et al* recently published their extensive literature review on the effectiveness of arts-based interventions in medical education suggesting that arts interventions can have positive effects on either attitudes or diagnostic observation skills.<sup>(6)</sup> However, the quality of this evidence varied widely and many different forms of evaluation and arts-based intervention were used. It is also worthwhile noting that all of those interventions were in the form of arts workshop, drama, and non-systematic visual arts

intervention, which are different from our study that incorporated critical thinking and expression skills altogether as shown in the way of “why and then” visualization concept.

Although the limitation of this action research is similar to quasi-experiment with a one-time post-intervention assessment in descriptive fashion, we still believe that this approach could be applied in either standalone or combination with existing traditional teaching approach with specific aim to strengthen critical thinking and creativity skills in medical students. The reason behind our belief is shown in the results of holistic viewpoint of the students by their graphical expression, in which we rarely see in other educational results at our institution to be comparable. Nevertheless, comparative efficacy of this approach either by itself or in combination is yet to wait for further investigation.

## Conclusion

To strengthen critical thinking and creativity skills of medical students, the application of graphical recording technique is useful and well received. It is an interesting approach for checking students' holistic viewpoint.

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