

## **DIFFERENT PERCEPTIONS OF PROBLEM BASED LEARNING AMONG POLISH AND SCANDINAVIAN STUDENTS. IS PBL THE SAME FOR EVERYONE? PRELIMINARY STUDY**

**Agnieszka Skrzypek**

**Tomasz Cegielny**

**Marta Szeliga**

**Konrad Jabłoński**

**Michał Nowakowski**

Department of Medical Education

Jagiellonian University

School of Medicine

ul. Św. Łazarza 16

31-530 Krakow, Poland

e-mail: agnieszka.skrzypek@gmail.com

**Abstract:** Background: Problem based learning (PBL) is often used to teach social competences which are very culture dependent and prior background, ethnicity and other factors may play a role. Data on role of those contributing factors is very limited. Aim of study: Comparison of perceptions of PBL between native Polish students and English language full time Scandinavian students of the same university. Methods: In 2013 a subject fully integrated with Pathology, based on PBL principles was introduced into the curriculum. Two groups of students were evaluated: group A (Polish) and group B (Scandinavian). Both had the same content. After one semester (75 hours) the analysis was performed. Anonymous and voluntary questionnaire evaluating various elements of the course (17 questions) was used. Results: We had sufficient return rate 78,9% (A:71/90) vs. 63,8% (B:46/72) respectively. Almost 62% of Polish and 67,4% of Scandinavians liked the method of teaching. 74,6%(A) vs. 78,3%(B) claimed that course motivated them to learn and explore knowledge in various fields. 71,8% vs. 89% think that time devoted is well spent. 60,6%(A) vs. 91%(B) claimed that the course help them to recall basic science and 39,4% vs. 69,3% students think that it increased their skills in teaching others. Class performance and MCQ test were not significantly different.

Polish and foreign students were satisfied with the PBL course. There are significant differences between students from different ethnic groups in their perceptions of PBL. Further assessment of PBL should be continued to better understand how to use it to maximize benefits of different students' populations. The same PBL course may be different for subpopulations of students.

**Keywords:** Problem Based Learning, culture dependent background, perceptions of PBL among different ethnic groups, cultural diversity among students.

### **Introduction**

The importance of cultural, in particular racial and ethnic diversity in medical educational programs was pointed out in 1999 by Loudon R., Anderson P., Gill P. and Greenfield S. [1]. It was connected then with multiracial, multiethnic and multicultural society in the United Kingdom. The researches focus their attention on whether government health service institutions reflect cultural sensitivity and competence and also whether medical students receive proper guidance in this area [1]. Medical school educators increasingly use problem-based learning strategies, particularly in the pre-clinical years [2, 3, 4]. Students are characterized by more active learning in this type of education. They have higher satisfaction. Problem-based learning is provided in small

groups (about 8-10 students in one group). This fact has a huge impact on overcoming cultural barriers and promoting collaborative learning among diverse student groups [2, 5-8]. Problem based learning is often used to teach social competences which are very culture dependent and prior background, ethnicity and other factors may play a role here. Data on role of those contributing factors is very limited. Problem based learning uses peer teaching and in medical education their value increases [9-11]. Student teaching in medical training affords many benefits to students in developing as a teacher and alike faculty being cost-effective [9, 12]. Medical students who teach their colleagues have reported positively on the experience, especially in developing clinical skills and knowledge [13, 14]. This method of learning may result in attainment results

comparable with those taught by professors and clinical lecturers [15]. Student teaching can be viewed positively or negatively depending on the teaching environment [16] and also cultural and social factors.

## Methods

This study is aimed to compare perceptions of problem based learning (PBL) between native Polish students and English language full time Scandinavian students of the same university and also establish satisfaction of students teaching. In 2013 a subject fully integrated with Pathology, based on PBL principles, so called Introduction to Clinical Science (ICS) was introduced into the curriculum. The students, who participated in this subject, were third year undergraduates on a six year medical course. The objective of the course was to solve problems on the basis of specially prepared clinical cases (CBL – case based learning), relating to one of the main disease entity, which was discussed parallel to classes of pathology. Students worked in groups of 8-10 people, classes were supervised by 1 tutor during one clinical case, and maximum 2 tutors led classes in one group during the whole ICS course. The students analyzed the available information, lab or imaging tests results and suggested further proceedings, which allow to acquire the skills that lead to self-solve problem. During the course 8 clinical cases were discussed, each of the case was divided into 4 to 6 parts, and students analyzed and

solved it for three consecutive meetings (3 meetings, each 2 hours and 15 minutes duration). While working on each new case, students performed brain-storming, discussion and created learning objectives (LO). Each student prepared a short presentation by a group selected topic or LO and presented it to the whole group during the next meeting (lecture or multimedia presentation). We evaluated two groups of students, who returned questionnaire: 71 Polish (group A – Polish-spoken) and 46 Scandinavian students (group B – English-spoken). Both of them had the same content, the same case report was prepared in the Polish and English language. After one semester (75 hours) the analysis was performed. A questionnaire was administered to students after participating in PBL course. Filling in the questionnaire was anonymous and voluntary. We used the questionnaire containing 17 questions: close- and open- ended, evaluating various elements of the course (Table 1.) The answers were coded as follows: 1 – Definitely Yes, 2 – Rather Yes, 3 – Yes / No, 4 – Rather Not, 5 – Definitely Not. For statistical analysis we used the software Statistica 12.0. T-student test and Pearson Chi<sup>2</sup> test were performed.

Ethics approval - consent for study: KBET 122.6120.225.2016. All of the participants received the explanatory statement along with the questionnaire. Therefore, filling in the questionnaire was considered as an informed consent to participate in this study.

Table 1. The questionnaire.

Dear student, We would like to kindly ask you to fill out the following questionnaire. It is aimed as assessment of your experience with Introduction to Clinical Sciences course. Should there be anything outside of questions that you would like to communicate to us please do so either at the end or at any other place that you find appropriate. Thank you in advance for your time and thoughtful responses.
1. Do you think the subject Introduction to Clinical Sciences (ICS) allows you to understand the meaning of learning basic sciences such as anatomy, biochemistry, physiology? <input type="checkbox"/> Definitely yes <input type="checkbox"/> Rather yes <input type="checkbox"/> Yes / No <input type="checkbox"/> Rather not <input type="checkbox"/> Definitely not
2. Do you think that ICS integrates knowledge of basic sciences with clinical knowledge? <input type="checkbox"/> Definitely yes <input type="checkbox"/> Rather yes <input type="checkbox"/> Yes / No <input type="checkbox"/> Rather not <input type="checkbox"/> Definitely not
3. Did ICS allow you to gain knowledge and learn new topics? <input type="checkbox"/> Definitely yes <input type="checkbox"/> Rather yes <input type="checkbox"/> Yes / No <input type="checkbox"/> Rather not <input type="checkbox"/> Definitely not
4. Did the course help you to recall basic science knowledge? <input type="checkbox"/> Definitely yes <input type="checkbox"/> Rather yes <input type="checkbox"/> Yes / No <input type="checkbox"/> Rather not <input type="checkbox"/> Definitely not
5. Do you like the way of teaching during ICS course? <input type="checkbox"/> Definitely yes <input type="checkbox"/> Rather yes <input type="checkbox"/> Yes / No <input type="checkbox"/> Rather not <input type="checkbox"/> Definitely not
6. Did ICS course help you to get some understanding of your role as a physician? <input type="checkbox"/> Definitely yes <input type="checkbox"/> Rather yes <input type="checkbox"/> Yes / No <input type="checkbox"/> Rather not <input type="checkbox"/> Definitely not
7. During the course you were asked to prepare several short presentations to teach your colleagues and share your knowledge. Did that give you satisfaction? <input type="checkbox"/> Definitely yes <input type="checkbox"/> Rather yes <input type="checkbox"/> Yes / No <input type="checkbox"/> Rather not <input type="checkbox"/> Definitely not
8. Did ICS course motivate you to learn and explore knowledge in various fields different then your main interest area? <input type="checkbox"/> Definitely yes <input type="checkbox"/> Rather yes <input type="checkbox"/> Yes / No <input type="checkbox"/> Rather not <input type="checkbox"/> Definitely not
9. Did ICS help you acquire skills in teaching other students? <input type="checkbox"/> Definitely yes <input type="checkbox"/> Rather yes <input type="checkbox"/> Yes / No <input type="checkbox"/> Rather not <input type="checkbox"/> Definitely not

10. Did ICS classes help you learn how to prepare and present a presentation? <input type="checkbox"/> Definitely yes <input type="checkbox"/> Rather yes <input type="checkbox"/> Yes / No <input type="checkbox"/> Rather not <input type="checkbox"/> Definitely not
11. Do you think the tutor led ICS classes in accordance to your expectations? <input type="checkbox"/> Definitely yes <input type="checkbox"/> Rather yes <input type="checkbox"/> Yes / No <input type="checkbox"/> Rather not <input type="checkbox"/> Definitely not If not, what would you change?.....
12. Do you think this subject is needed in the curriculum of medical studies? <input type="checkbox"/> Definitely yes <input type="checkbox"/> Rather yes <input type="checkbox"/> Yes / No <input type="checkbox"/> Rather not <input type="checkbox"/> Definitely not
13. Do you think that the cases discussed in the ICS classes are interesting? <input type="checkbox"/> Definitely yes <input type="checkbox"/> Rather yes <input type="checkbox"/> Yes / No <input type="checkbox"/> Rather not <input type="checkbox"/> Definitely not
14. Do you think you're wasting time by taking part in ICS classes? <input type="checkbox"/> Definitely yes <input type="checkbox"/> Rather yes <input type="checkbox"/> Yes / No <input type="checkbox"/> Rather not <input type="checkbox"/> Definitely not
15. Do you think that more clinical cases should be discussed at the ICS classes (course should be longer)? <input type="checkbox"/> Definitely yes <input type="checkbox"/> Rather yes <input type="checkbox"/> Yes / No <input type="checkbox"/> Rather not <input type="checkbox"/> Definitely not
16. Do you like the way of teaching we use at ICS (principles of PBL)? <input type="checkbox"/> Definitely yes <input type="checkbox"/> Rather yes <input type="checkbox"/> Yes / No <input type="checkbox"/> Rather not <input type="checkbox"/> Definitely not
17. Are ICS classes optimally integrated / synchronized with the pathology? <input type="checkbox"/> Definitely yes <input type="checkbox"/> Rather yes <input type="checkbox"/> Yes / No <input type="checkbox"/> Rather not <input type="checkbox"/> Definitely not

### Summary of results

We obtained a significant percentage of our questionnaire returns: 78.9% (71/90) from group A vs. 63.8% (46/72) from group B respectively. Over 91% Scandinavian students (B) vs. 60.5% Polish-spoken (A)

claimed that the course helped them to recall basic science (Q4) while none of the Scandinavians considered that the course did not help them, so think as much as 15.5% of Polish students. The difference between two groups of students was statistically significant,  $p=0.004$  (Fig. 1).

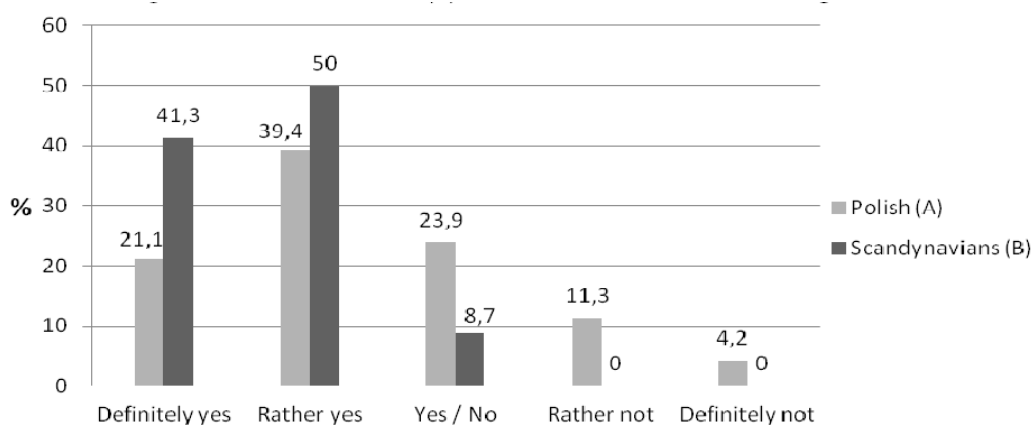


Fig. 1. Q4. Did the course help you to recall basic science knowledge?

The similar results in both groups were observed analyzing questions Q5 and Q8. 62% of Polish (A) and 67.4% of Scandinavians (B) liked the method of teaching (Q5), and 74.6% (A) vs. 78.3% (B) claimed that course motivated them to learn and explore knowledge in various fields (Q8). There were no statistically significant differences between the nationalities: Q5 and Q8,  $p=ns$ , (Fig. 2, 3).

Comparable to Scandinavian most of Polish students feel satisfaction with preparing presentations to teach their colleagues and share their knowledge: on the Q7 the answer “definitely yes” and “rather yes” has been chosen

respectively by 55.38% (B) vs. 54.97% (A),  $p=ns$ . Statistically significant majority of Scandinavian students 69.3% (B) vs. 39.4% (A) thought that it increased their skills in teaching others (Q9),  $p=0,013$ . (Fig. 4).

Over 80% of both groups claimed that this subject is needed in the curriculum of medical studies (Q12), and the results were no significant among,  $p=ns$  (Fig. 5). This confirms the fact that the structure of the subject and method of teaching is interesting and absorbing for students and introduces a new quality in their education.

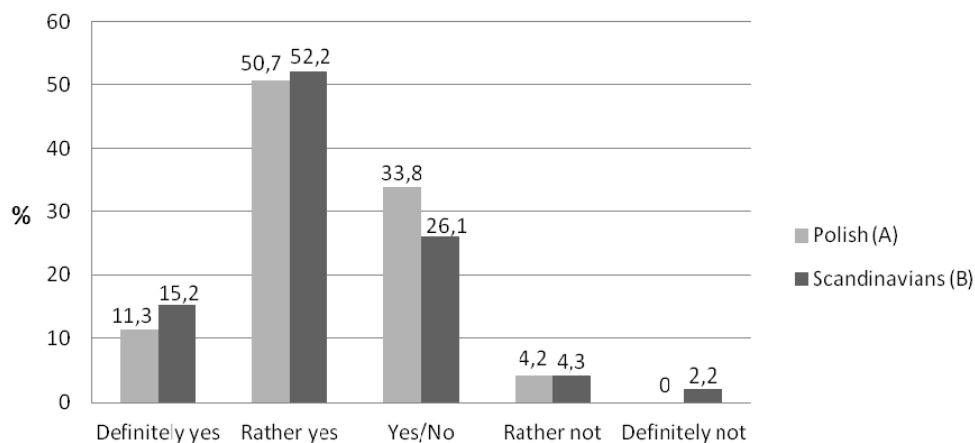


Fig. 2. Q5. Did you like the way of teaching during ICS course?

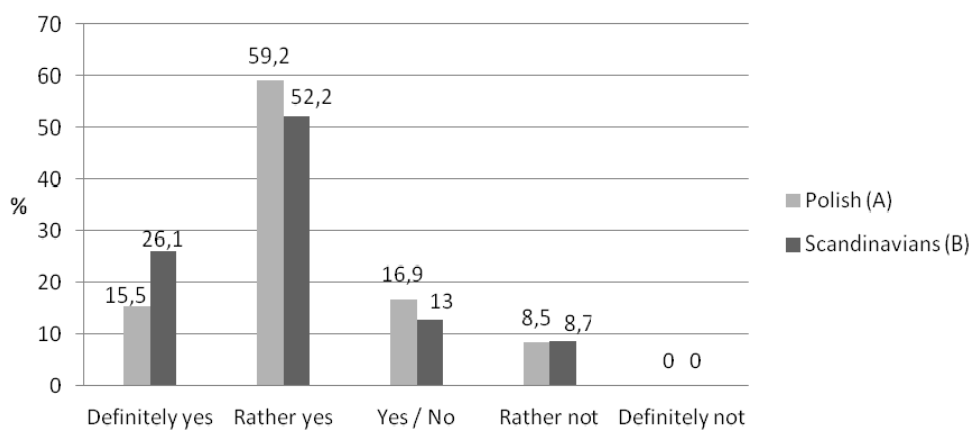


Fig. 3. Q8. Did ICS course motivate you to learn and explore knowledge in various fields?

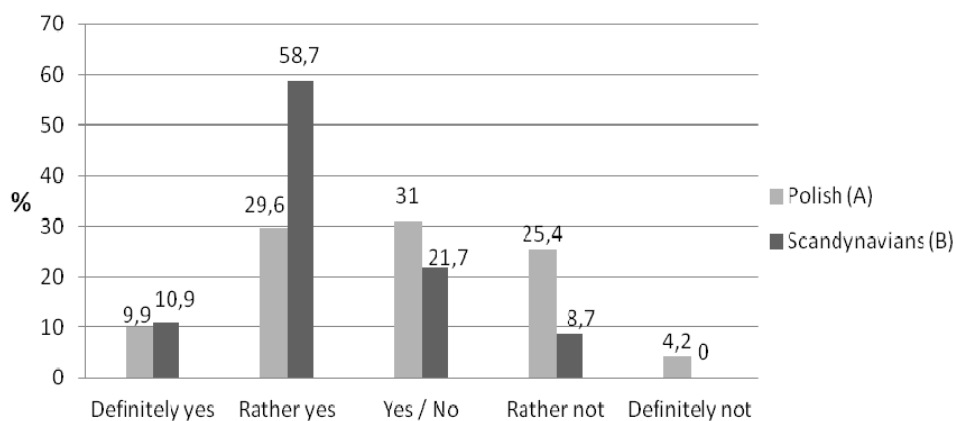


Fig. 4. Q9. Did ICS help you acquire skills in teaching other students?

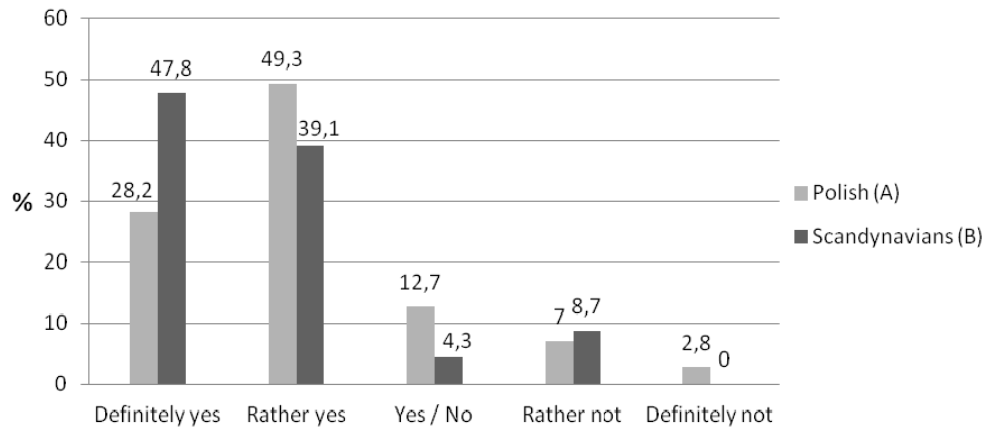


Fig. 5. Q12. Do you think this subject is needed in the curriculum of medical studies?

About 72% of Polish and more than 89% of Scandinavian students thought that time devoted on the course was well spent (Q14) but almost 13% of Polish students considered that a waste of time when none of the Scandinavians thought similarly. The difference was statistically significant  $p=0,027$  (Fig. 6).

Responses to the other questions were very similar in both groups, and the differences were not statistically significant. Class performance assessed by the tutors and MCQ test were not significantly different.

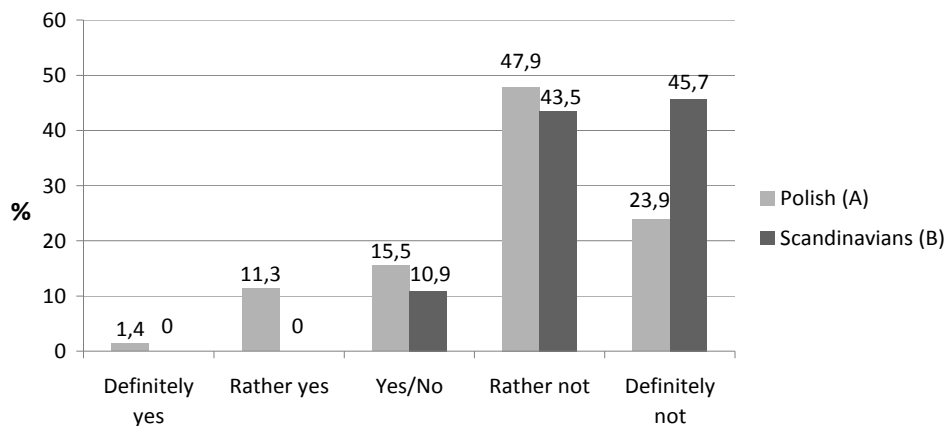


Fig. 6. Q14. Do you think you're wasting time by taking part in ICS classes?

## Discussion

Nowadays there is still limited information available on an increasingly important subject connected with cultural diversity and differences among students in medical education. According to van Wieringen, Kijlstra and Schulpfen, in multi-ethnic societies the challenge is to face various aspects of cultural diversity, such as communication barriers and differences in religion, socioeconomic status and ethnic background [17, 18]. It is important that students have different priorities and learning objectives depending on nationality and culture even participating in an identical program at different stages in their education [1, 19]. It was documented by Kaufert et al. in their publication about the impact of

sociocultural and political factors in clinical communication by using of “trouble case” examples in teaching [19]. Another significant problem is development of language skills enabling students to acquire sufficient skills to work effectively in English and also in Polish with patients in Polish hospitals [20, 21]. Our study proved that cultural diversity in medical education should be considered in the curriculum. For example, we should give more opportunities to the Polish students to prepare presentations and in this way to teach their colleagues. Dogra et al. and Lu et al. suggested that it could be a challenge to construct a curriculum in ethnically diverse countries [22-25]. Our finding resembles these which described a remarkable absence of clear content and lack of universal standards

for cultural diversity training [22-25]. An overload curriculum could also be a problem, especially for foreign students [25]. A strategy to incorporate cultural competence into curricula was developed in the USA [26]. Also cultural diversity training for doctors was initiated in the UK [27] and in Canada [28]. Further research that focused on identifying effective components of educational programs on cultural diversity and valid methods of program evaluation and student assessment is needed [1]. We hope that our analysis raises awareness of significance different perceptions of the same subject among students of different nationalities.

## Conclusions

Our study proves that the same PBL course may be different for subpopulations of students depending on their national culture. Polish and Scandinavian students were satisfied with the PBL course. There are significant differences between students from different ethnic groups in their perceptions of PBL. Our study suggests that medical students need to increase their skills in teaching others. Competences in teaching are needed by them because they should professionally teach their patients (of different nationality) and some of the students (of diverse culture) in the future. Further assessment of PBL should be continued to better understand how to use it to maximize benefits of different students' populations. In the near future we will also explore perceptions of Problem Based Learning among Polish, Scandinavian and American students.

## References

1. Loudon, R.F., Anderson, P.M., Gill, P.S., Greenfield, S.M., Educating Medical Students for Work in Culturally Diverse Societies, *JAMA*, Sept. 1, 282(9), 1999, pp. 875-880.
2. Hoffman, M., Wilkinson, J.E., Xu, J., Wiecha, J., The perceived effects of faculty presence vs. absence on small-group learning and group dynamics: a quasi-experimental study, *BMC Med Educ.*, 2014 Dec. 10, 14, 258, 2014.
3. Neville, A.J., Problem-based learning and medical education forty years on, *Med Princ Pract.*, 18, 2009, pp. 1-9.
4. Cendan, J.C., Silver, M., Ben-David, K., Changing the student clerkship from traditional lectures to small group case-based sessions benefits the students and the faculty, *J. Surg Educ.*, 68(2), 2011, pp. 117-120.
5. Willis, S.C., Jones, A., Bundy, C., Burdett, K., Whitehouse, C.R., O'Neill, P.A., Small-group work and assessment in a PBL curriculum: a qualitative and quantitative evaluation of student perceptions of the process of working in small groups and its assessment, *Med. Teach.*, 24(5), 2002, pp. 495-501.
6. Kassab, S., Abu-Hijleh, M.F., Al-Shboul, Q., Hamdy, H., Student-led tutorials in problembased learning: educational outcomes and students' perceptions, *Med. Teach.*, 27(6), 2005, pp. 521-526.
7. McLean, M., Van Wyk, J.M., Peters-Futre, E.M., Higgins-Opitz, S.B., The small group in problem-based learning: more than a cognitive 'learning' experience for first-year medical students in a diverse population, *Med. Teach.*, 28(4), 2006, pp. 94-103.
8. Singaram, V.S., Dolmans, D.H., Lachman, N., van der Vleuten, C.P., Perceptions of problem-based learning (PBL) group effectiveness in a socially-culturally diverse medical student population, *Educ. Health.*, 21(2), 2008, 116.
9. Mills, J.K., Dalleywater, W.J., Tischler, V., An assessment of student satisfaction with peer teaching of clinical communication skills, *BMC Med. Educ.*, Oct. 13, 14:217, 2014, doi: 10.1186/1472-6920-14-217.
10. Krych, A.J., March, C.N., Bryan, R.E., Peake, B.J., Pawlina, W., Carmichael, S.W., Reciprocal peer teaching: Students teaching students in the gross anatomy laboratory, *Clin. Anat.*, 18, 2005, pp. 296-301.
11. Schaffer, J.L., Wile, M.Z., Griggs, R.C., Students teaching students: a medical school peer tutorial programme, *Med. Educ.*, 24, 1990, pp. 336-343.
12. Ten Cate, O., Durning, S., Peer teaching in medical education: twelve reasons to move away from theory to practice, *Med. Teach.*, 29, 2007, 591-599.
13. Field, M., Burke, J.M., McAllister, D., Lloyd DM. Peer-assisted learning: a novel approach to clinical skills learning for medical students, *Med. Educ.*, 2007;41, 2007, pp. 411-418.
14. Koles, P.G., Stolfi, A., Borges, N.J., Nelson, S., Parmelee, D.X., The impact of team-based learning on medical students' academic performance, *Acad. Med.*, 85, 2010, pp. 1739-1745.
15. Tolsgaard, M.G., Gustafsson, A., Rasmussen, M.B., HØiby, P., Müller, C.G., Ringsted, C., Student teachers can be as good as associate professors in teaching clinical skills, *Med. Teach.*, 29, 2007, pp. 553-557.
16. Arnold, L., Shue, C.K., Kritt, B., Ginsburg, S., Stern, D.T., Medical Students' views on peer assessment of professionalism, *J. Gen. Intern. Med.*, 20, 2005, pp. 819-824.
17. Paternotte, E., Fokkema, J.P., van Loon, K.A., van Dulmen, S., Scheele, F., Cultural diversity: blind spot in medical curriculum documents, a document analysis, *BMC Med. Educ.*, Aug 22;14:176, 2014, doi: 10.1186/1472-6920-14-176.
18. van Wieringen, J.C., Kijlstra, M.A., Schulpen, T.W., Medical education in the Netherlands: little attention paid to the cultural diversity of patients, *Ned. Tijdschr. Geneesk.*, 147, 2003, pp. 815-819.

19. Kaufert, J.M., Koolage, W.W., Kaufert, P.L., O'Neil, J.D., The use of "trouble case" examples in teaching the impact of sociocultural and political factors in clinical communication, *Med. Anthropol.*, 8(1), 1984, pp. 36-45.
20. Gonzalez-Lee, T., Simon, H.J., Teaching Spanish and cross-cultural sensitivity to medical students, *West. J. Med.*, Apr., 146(4), 1987, pp. 502-504.
21. Nora, L.M., Daugherty, S.R., Mattis-Peterson, A., Stevenson, L., Goodman, L.J., Improving cross-cultural skills of medical students through medical schoolcommunity partnerships, *West. J. Med.*, 1994 Aug, 161(2), pp. 144-147.
22. Flores, G., Gee, D., Kastner, B., The teaching of cultural issues in U.S. and Canadian medical schools, *Acad. Med.*, 75, 2000, pp. 451-455.
23. Wachtler, C., Troein, M., A hidden curriculum: mapping cultural competency in a medical programme, *Med. Educ.*, 37, 2003, pp. 861-868.
24. Dogra, N., Reitmanova, S., Carter-Pokras, O., Teaching cultural diversity: current status in U.K., U.S., and Canadian medical schools, *J. Gen. Intern. Med.*, 25(Suppl. 2), 2010, S164-S168, doi: 10.1007/s11606-009-1202-7.
25. Lu, P.Y., Tsai, J.C., Tseng, S.Y.H., Clinical teachers' perspectives on cultural competence in medical education, *Med. Educ.*, 48, 2014, pp. 204-214.
26. National Center for Cultural Competence. Georgetown, USA, 2014, <http://www.ncccurrericula.info/modules.html>, Ref. Type: Online Source.
27. General Medical Council, 2014, <http://www.gmc-uk.org/index.asp>. 16-7-2014, Ref Type: Online Source.
28. Indigenous Cultural Competency Training Program, 2014, <http://www.culturalcompetency.ca/home>, 16-7-2014. Ref. Type: Online Source.