THE EFFECT OF COMBINING TEAM BASED LEARNING (TBL) AND PROBLEM-BASED LEARNING (PBL) UPON THE STUDENTS' PERCEPTION TOWARD PROBLEM BASED LEARNING AT COLLEGE OF DENTISTRY, QASSIM UNIVERSITY: A CROSS SECTIONAL STUDY

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Abstract:
Background: This study aims to compare the level of interest, enthusiasm, and personal satisfaction regarding problem based learning among the students who exposed to combined problem based learning with team based learning and those who did not, at College of Dentistry, Qassim University.

Method: Data was collected through a questionnaire-based survey at College of Dentistry, Qassim University. It consisted of 10 questions was distributed to two groups. The first group exposed to PBL combined to TBL approach while the second group "exposed only to PBL. A total of 157 students were included. Data were coded and entered into Microsoft Excel software and analyzed using SPSS® version 20 statistical software. Pearson's chi-square test was used .

Results: Out of 200 students recruited for the study, 157 returned a complete questionnaire . Both groups thought that problem based learning sessions are interesting . Attending the sessions was stressful for (51%). (47.1 %) agreed that all students participate in discussion during sessions. problem based learning is beneficial in achieving learning objectives .Half of the subjects agreed that problem based learning allows in-depth understanding of the topics and it provides group interaction skills. Learning resources available for PBL sessions are not enough and the time allotted for sessions is enough. Tutors effectively facilitate the PBL sessions and problem based learning improved knowledge and communication skills. No statistically significant differences between the two groups.

Conclusions: Perception of students regarding the combined approach was more positive than negative. It is a successful and interesting educational method. However, some improvements are required to provide students with stimulating favorable learning environment. It is necessary to supply and orient the students about available learning resources and manage the associated stresses Moreover, students' recommendations and comments are very helpful as they showed high acceptance to the new learning styles.

Keywords: *Education, perception, problem-based learning, team based learning, hybrid PBL, TBL*

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INTRODUCTION:

Problem-based learning (PBL) began in McMaster University medical program in 1965 with the aim of improving students' ability to apply knowledge in clinical contexts, increasing the information retention, and developing lifelong learning habits (1). Problem-based learning (PBL) is an educational approach in which a problem serves as the stimulus for active learning. PBL depends on students in the way that they recognize and define the problem and then state the learning issues that are essential to understand the problem.

This approach is based on small groups of students working together and collaborating with a tutor (2). Since its implementation, it has spread throughout different parts of the world with multiple variations (3). Many health profession schools have adopted various forms of PBL methods, including Qassim University Dental College where a PBL hybrid curriculum has been applied more than 8 years ago by combining the traditional -lecture based - approach with PBL.

Recently, since 2015, team based learning (TBL) is introduced in the college along with the PBL and the traditional lectures. Team based learning (TBL) approach was implemented at the Dental Branch in 2005 for the first time in the entire undergraduate curriculum (4). Based upon the approach developed by *Hunt et al.,* the main goal of TBL is to ensure that students have the opportunity to practice using course concepts. This approach results in using most of class time for teamwork on application-focused assignments.

The TBL strategy involves four basic principles: 1) groups must be properly formed and managed; 2) students must be made accountable for their learning; 3) team assignments must promote both learning and team development; and 4) students must receive frequent and immediate feedback (5). Some faculty may assume that TBL is similar to problem-based learning (PBL).

TBL and PBL are similar in the aim of fully engaging the students, both strategies tend to improve interaction levels in the teaching and learning setting. The main difference between PBL & TBL is that PBL is learner-centered and is applied on a small group classes without interaction with the large group as a whole, whereas TBL requires that interaction. The scenario of the problem is presented to the students before studying relevant topics in PBL and are asked to find a solution of the problem over the course of several days with receiving additional problem-related materials continuously. While team based learning is mainly instructor-centered and is applies in a larger classroom population with students divided up into small groups around the classroom and then coming together for discussion , evaluation and feedback multiple times throughout instructional sessions. Students usually have the content information before the sessions and then are asked to use that material to solve problems by working through application (6).

In the academic year 2014- 2015, a research is conducted in college of dentistry, Qassim University by Alkhuwaiter et.al , which aimed to assess perception of students regarding the problem-based learning (PBL) curriculum. Results stated that the perception was more positive than negative. However, improvements are still required to provide students with stimulating favorable learning environment (7).

MATERIALS AND METHODS:

A cross-sectional study was conducted to compare the perception, the level of interest, enthusiasm and personal satisfaction of the students regarding the PBL curriculum, which is implemented at the College of Dentistry, Qassim University. The study was performed between February and April 2017. Ethical approval and informed consent for carrying out the study was obtained by the ethical committee at Dental Research Centre (DRC), College of Dentistry, Qassim University.

The sampling frame was taken from undergraduate dental students who studied at Qassim University as two groups, the first group (A) including first and second year students who were exposed to TBL combined to PBL. While the second group(B) includes third- and fourth-year students who were exposed to PBL only during the research conduction period and participated in this study.

A study sample was randomly selected from the sampling frame. A total of 157 dental students agreed to participate. The inclusion criterion for this study was any Qassim dental students who were exposed to TBL and / or PBL at the time of the study and wanted to participate. Students who are not exposed to TBL and / or PBL "Fifth year students and interns" and those unwilling to fill in the questionnaire and gave incomplete answers to the questionnaire were excluded.

The paper-based questionnaire used in the study was an anonymous self-administered pretested structured questionnaire that was developed and validated by

Barman et. al (9). The questionnaire was slightly modified to achieve the objectives of the study. It was further piloted on 20 students for validation. Two questions were excluded after the conduction of a pilot study since they were difficult to understand due to the student's English level. The questionnaire included questions on year of study and gender. Other than personal information and opinion about different aspects of PBL like student interest and enthusiasm, personal satisfaction, tutors' role, availability of learning resources, timing of sessions was included in the questionnaires as 10 opinion questions [Fig.1].

They were in 5-point Likert scale, 1 for "strongly agree" and 5 for "strongly disagree". For analysis responses to statement were grouped into three, "strongly agree & agree", "undecided" and "disagree & strongly disagree". One open-ended question was also included at the end of the survey directed to group A (1st and 2nd year students); requested them to choose if they would like to learn through PBL only without combining it to TBL and why.
Data were coded and entered into Microsoft Excel software and analyzed using SPSS® version 20 (IBM Corporation, Armonk, NY, and USA) statistical software. Absolute and percentage distributions were obtained for qualitative variables. Pearson's chi-square test was used for data analysis. The margin of error for interpretation of the statistical tests was set at $P < 0.05$.

RESULTS:
Out of 200 students recruited for the study, 157 undergraduate dental students from first and second (Group A), third and fourth year (Group B) returned a complete questionnaire (the response rate was 78.5 %). Male students constituted 51% of the sample, whereas female students were 49 %. Details of other characteristics of the sample are presented in [Table 1- Fig 2]. Both groups thought that PBL sessions are interesting 49.7 %, (26.8 %) in group A and (22.9%) in group B. Attending PBL sessions was stressful for 51 % of the students, (25.5 %) in group A and (25.5 %) in group B.

47.1 % agreed that all students in PBL participate in discussion (26.1 %) in group A and (21%) in group B. PBL sessions are beneficial in achieving learning objectives according to the opinion of 45.2 % of the students, (22.9%) in group A and (22.3%) in group B. 43.9 % of the sample agreed that PBL allows in-depth understanding of the topics (24.2%) in group A and (19.7%) in group B.

63.7 % thought that PBL provides group interaction skills (31.8 %) in group A and (31.8 %) in group B. Learning resources available for PBL sessions are not enough based on the response of 36.9 %, (17.8%) in group A and (19.1%) in group B. 65.6% thought that time allotted for each of the PBL sessions is enough (28.7%) in group A and (36.9%) in group B. Tutors effectively facilitate the PBL sessions as 55.4% agreed , (26.1%) in group A and (29.3%) in group B. 62.4% believed that PBL improved knowledge and communication skills, (32.5%) in group A and (29.9%) in group B. There were no statistically significant differences at the level of (p<0.05) regarding the comparison between the groups [Table 2 - Fig 3]. Furthermore, detailed comparison between the student's responses based on the year is presented in [Table 3] with no statistically significant difference.

 [Table 4 - Fig 4] presents a comparison of the students' responses according to gender. There were statistically significant differences between male and female students in many variables, including assuming that PBL sessions are beneficial in achieving learning objectives (P<0.025); enough learning resources are available and utilized for PBL sessions (P<0.001); Tutors effectively facilitated the PBL sessions (P<0.05); PBL improved knowledge and communication skills (P<0.003) [Table 4]. On the other hand, 72.2 % of Group A liked to learn through PBL- TBL combined approach, while only 27.8% didn't like that combination and wanted to learn through PBL only [Table 5- Fig 5].

Table -1

Variable	Category	Percentage
Gender	Female	49%
	Male	51%
Year	1st	25.5%
	2nd	24.8%
	3rd	24.8%
	4th	24.8%

Table -2

Statement	Group	SA/A Number (%)	Uncertain Number (%)	SD/D Number (%)	X^2 (P)
1. PBL sessions are interesting	A	42 (26.8%)	15(9.6%)	22(14%)	1.559ª (0.459)
	B	36(22.9%)	13(8.3%)	29(18.5%)	
	Total	78(49.7%)	28(17.8%)	51(32.5%)	
2.Attending PBL sessions is stressful	A	40(25.5%)	24(15.3%)	15(9.6%)	0.028 ª (0.986)
	B	40(25.5%)	24(15.3%)	14(8.9%)	
	Total	80 (51%)	48(30.6%)	29(18.5%)	
3.All students in PBL group participate in discussion	A	41(26.1%)	22(14%)	16(10.2%)	3.459 ª (0.177)
	B	33(21%)	19(12.1%)	26(16.6%)	
	Total	74(47.1%)	41(26.1%)	42(26.8%)	
4.PBL sessions beneficial in achieving learning objectives	A	36(22.9%)	23(14.6%)	20(12.7%)	0.435 ª (0.805)
	B	35(22.3%)	26(16.6%)	17(10.8%)	
	Total	71(45.2%)	49(31.2%)	37(23.6%)	
5.PBL allows in-depth understanding of the topics	A	38(24.2%)	22(14%)	19(12.1%)	1.137 ª (0.566)
	B	31(19.7%)	26(16.6%)	21(13.4%)	
	Total	69(43.9%)	48(30.6%)	40(25.5%)	
6.PBL provides group interaction skills	A	50(31.8%)	16(10.2%)	13(8.3%)	1.453 ª (0.484)
	B	50(31.8%)	11(7%)	17(10.8%)	
	Total	100(63.7%)	27(17.2%)	30(19.1%)	
7.Enough learning resources are available for PBL sessions	A	28(17.8%)	23(14.6%)	28(17.8%)	3.937 ª (0.140)
	B	17(10.8%)	31(19.7%)	30(19.1%)	
	Total	45(28.7%)	54(34.4%)	58(36.9%)	
8.Time allotted for each of the PBL session is enough	A	45(28.7%)	18(11.5%)	16(10.2%)	5.305 ª (.070)
	B	58(36.9%)	10(6.4%)	10(6.4%)	
	Total	103(65.6%)	28(17.8%)	26(16.6%)	
9.Tutors effectively facilitated PBL sessions	A	41(26.1%)	24(15.3%)	14(8.9%)	1.035 ª (0.596)
	B	46(29.3%)	22(14%)	10(6.4%)	
	Total	87(55.4%)	46(29.3%)	24(15.3%)	
10.PBL improved knowledge and communication skills	A	51(32.5%)	14(8.9%)	14(8.9%)	1.576 ª (0.455)
	B	47(29.9%)	20(12.7%)	11(7%)	
	Total	98(62.4%)	34(21.7%)	25(15.9%)	
SA: strongly agree, A: agree, D: disagree, SD: strongly disagree* Statistically significant at P<0.05					

Table -3

Statement	Gender	SA/A Number (%)	Uncertain Number (%)	SD/D Number (%)	X^2
1. PBL sessions are interesting	1st	21(13.4%)	9(5.7%)	10(6.4%)	5.986 [a] (0.425)
	2nd	21(13.4%)	6(3.8%)	12(7.6%)	
	3rd	14(8.9%)	7(4.5%)	18(11.5%)	
	4th	22(14%)	6(3.8%)	11(7%)	
	total	78(49.7%)	28(17.8%)	51(32.5%)	
2.Attending PBL sessions are stressful	1st	21(13.4%)	13(8.3%)	6(3.8%)	1.278 [a] (0.973)
	2nd	19(12.1%)	11(7%)	9(5.7%)	
	3rd	21(13.4%)	12(7.6%)	6(3.8%)	
	4th	19(12.1%)	12(7.6%)	8(5.1%)	
	total	80(51%)	48(30.6%)	29(18.5%)	
3.All students in PBL group participate in discussion	1st	23(14.6%)	12(7.6%)	5(3.2%)	7.199 [a] (0.303)
	2nd	18(11.5%)	10(6.4%)	11(7%)	
	3rd	17(10.8%)	11(7%)	11(7%)	
	4th	16(10.2%)	8(5.1%)	15(9.6%)	
	total	74(47.1%)	41(26.1%)	42(26.8%)	
4.PBL sessions beneficial in achieving learning objectives	1st	22(14%)	9(5.7%)	9(5.7%)	10.190 [a] (0.117)
	2nd	14(8.9%)	14(8.9%)	11(7%)	
	3rd	12(7.6%)	15(9.6%)	12(7.6%)	
	4th	23(14.6%)	11(7%)	5(3.2%)	
	total	71(45.2%)	49(31.2%)	37(23.6%)	
5.PBL allows in-depth understanding of the topics	1st	23(14.6%)	10(6.4%)	7(4.5%)	4.593 [a] (0.597)
	2nd	15(9.6%)	12(7.6%)	12(7.6%)	
	3rd	16(10.2%)	12(7.6%)	11(7%)	
	4th	15(9.6%)	14(8.9%)	10(6.4%)	
	total	69(43.9%)	48(30.6%)	40(25.5%)	
6.PBL provides group interaction skills	1st	28(17.8%)	6(3.8%)	6(3.8%)	1.453 [a] (0.484)
	2nd	22(14%)	10(6.4%)	7(4.5%)	
	3rd	21(13.4%)	5(3.2%)	13(8.3%)	
	4th	29(18.5%)	6(3.8%)	4(2.5%)	
	total	100(63.7%)	27(17.2%)	30(19.1%)	
7.Enough learning resources are available for PBL sessions	1st	14(8.9%)	10(6.4%)	16(10.2%)	5.017 [a] (0.542)
	2nd	14(8.9%)	13(8.3%)	12(7.6%)	
	3rd	8(5.1%)	15(9.6%)	16(10.2%)	
	4th	9(5.7%)	16(10.2%)	14(8.9%)	
	total	45(28.7%)	54(34.4%)	58(36.9%)	
8.Time allotted for each of the PBL session is enough	1st	21(13.4%)	10(6.4%)	8(5.1%)	9.926 [a] (0.128)
	2nd	24(15.3%)	8(5.1%)	7(4.5%)	
	3rd	30(19.1%)	2(1.3%)	7(4.5%)	
	4th	28(17.8%)	8(5.1%)	3(1.9%)	
	total	103(65.6%)	28(17.8%)	26(16.6%)	
9.Tutors effectively facilitated PBL sessions	1st	18(11.5%)	15(9.6%)	7(4.5%)	6.527 [a] (0.367)
	2nd	23(14.6%)	9(5.7%)	7(4.5%)	
	3rd	19(12.1%)	14(8.9%)	6(3.8%)	
	4th	27(17.2%)	8(5.1%)	4(2.5%)	
	total	87(55.4%)	46(29.3%)	24(15.3%)	
10.PBL improved knowledge and communication skills	1st	25(15.9%)	8(5.1%)	6(3.8%)	12.265 [a] (0.056)
	2nd	25(15.9%)	6(3.8%)	8(5.1%)	
	3rd	17(10.8%)	15(9.6%)	7(4.5%)	
	4th	30(19.1%)	5(3.2%)	4(2.5%)	
	total	98(62.4%)	34(21.7%)	25(15.9%)	
SA: strongly agree, A: agree, D: disagree, SD: strongly disagree*. Statistically significant at P<0.05					

Table -4

Statement	Gender	SA/A Number (%)	Uncertain Number (%)	SD/D Number (%)	X^2
1. PBL sessions are interesting	Female	33 (21%)	12(7.6%)	32(20.4%)	5.676 [a] (0.059)
	Male	45(28.7%)	16(10.2%)	19(12.1%)	
	Total	78(49.7%)	28(17.8%)	51(32.5%)	
2.Attending PBL sessions is stressful	Female	39(24.8%)	24(15.3%)	14(8.9%)	0.027 [a] (0.987)
	Male	41(26.1%)	24(15.3%)	15(9.6%)	
	Total	80 (51%)	48(30.6%)	29(18.5%)	
3.All students in PBL group participate in discussion	Female	42(26.8%)	23(14.6%)	20(12.7%)	3.348 [a] (0.188)
	Male	32(20.4%)	26(16.6%)	17(10.8%)	
	Total	74(47.1%)	49(31.2%)	37(23.6%)	
4.PBL sessions beneficial in achieving learning objectives	Female	43(27.4%)	21(13.4%)	13(8.3%)	7.385 [a] (.025)
	Male	28(27.8%)	28(17.8%)	24(15.3%)	
	Total	71(45.2%)	49(31.2%)	37(23.6%)	
5.PBL allows in-depth understanding of the topics	Female	33(21%)	26(16.6%)	18(11.5%)	.807 [a] (0.668) `
	Male	36(22.9%)	22(14%)	22(14%)	
	Total	69(43.9%)	48(30.6%)	40(25.5%)	
6.PBL provides group interaction skills	Female	54(34.4%)	11(7%)	12(7.6%)	2.710 [a] (0.258)
	Male	46(29.3%)	16(10.2%)	18(11.5%)	
	Total	100(63.7%)	27(17.2%)	30(19.1%)	
7.Enough learning resources are available for PBL sessions	Female	17(10.8%)	20(12.7%)	40(25.5%)	14.611 [a] (0.001)
	Male	28(17.8%)	34(21.7%)	18(11.5%)	
	Total	45(28.7%)	54(34.4%)	58(36.9%)	
8.Time allotted for each of the PBL session is enough	Female	57(36.3%)	10(6.4%)	10(6.4%)	4.790 [a] (.091)
	Male	46(29.3%)	18(11.5%)	16(10.2%)	
	Total	103(65.6%)	28(17.8%)	26(16.6%)	
9.Tutors effectively facilitated PBL sessions	Female	46(29.3%)	16(10.2%)	15(9.6%)	5.993 [a] (0.050)
	Male	41(26.1%)	30(19.1%)	9(5.7%)	
	Total	87(55.4%)	46(29.3%)	24(15.3%)	
10.PBL improved knowledge and communication skills	Female	58(36.9%)	13(8.3%)	6(3.8%)	11.895 [a] (0.003)
	Male	40(25.5%)	21(13.4%)	19(12.1%)	
	Total	98(62.4%)	34(21.7%)	25(15.9%)	

SA: strongly agree, A: agree, D: disagree, SD: strongly disagree*. Statistically significant at P<0.05

Table -5

Category	Frequency	Percentage
Students liked PBL alone	22	27.8%
Students liked PBL combined with TBL	57	72.2%
Total	79	100%

DISCUSSION:

The present study was undertaken to assess perception of Saudi dental students regarding the PBL curriculum and to figure out the effect of combining it to TBL on that perception. It also compares their perceptions among different sex and academic years. The students' self-assessment and evaluation of their attitude, ideas and its application is a valuable process in learning to identify areas of improvement (10).

In this study, both groups A & B thought that PBL sessions are interesting (49.7%) Similar Malaysian studies reported that 78%, 52.3% of students perceived that PBL sessions were interesting (11) (12). Students commented that PBL breaks up the learning routine they used to in traditional lectures. Group A students found it enjoyable because they don't have a quiz after each scenario since they will be examined at TBL session.

In addition, both groups (62.4 %) believed that PBL improves knowledge and communication skills. This may be due to that PBL encourages students to do more self-learning and motivate student centered learning. Seneviratne et. al (13), observed that PBL helped to improve communication skills and problem-solving skills of students. In the present study, group A noted that combining TBL to PBL and traditional lectures helped them to receive the information in different styles, providing more information retention. There was a statistically significant difference between female and male students (P=0.003), since female agreed that PBL improved knowledge and communication skills more than male.

Group A and B agreed that PBL provides group interaction skills (63.7%). Another study showed that 77.9% of sample agreed with our finding (9). PBL enhances the ability to speak in front of people, promotes group work and generates high level of motivation and enthusiasm -especially for dental students who will always be working in team environments- , these learning experiences are invaluable (14)(15). Regarding group A, the combination between PBL and TBL will positively affect group interaction skills as it is enhanced by group readiness assessment test (GRAT) performed during TBL (16).

Only (47.1%) of both groups agreed that all students in PBL group participate in discussion while the rest were uncertain or disagreed. Barman et. al(9) reported almost same finding. To improve the response of our students we can modify the PBL

technique through peer evaluation as in TBL in which team members conduct mutual peer evaluation of their contributions to the success of the group and their own learning. (17) Peer feedback has positive effects on students' contributions to the team and on students' commitment to group work (18).

Nearly half of the sample (55.4%) agreed with the fact that tutors effectively facilitate PBL sessions. They play an important role as facilitator by encouraging students to ask critical questions, discuss cognitive disagreements, explain new knowledge in their own words and apply new knowledge and insights to solve the problem in question (16). This is in agreement with findings reported that majority of the students believe that the tutor has an essential role in PBL and effectively facilitate the sessions (15) (19).

A major difference between PBL and TBL is that in TBL one teacher runs various groups simultaneously "Learner-centered", while in PBL there is one teacher for each group "Tutor-centered"(16). Chang et al. (20) reported that average students may depend more on the tutor in PBL to guide and motivate them in order to achieve their learning goals. New attitudes and skills may be required from the tutors so that they are willing and competent to deal with the PBL method (21).

(45.2%) of the sample believed that PBL sessions are beneficial in achieving learning objectives. In PBL, students elaborated on their discussion and generated all possible hypotheses that explain the problem. At the end of the first session, they developed educational objectives to fill the gaps in their knowledge (22). This characteristic of PBL might be of benefit to TBL because it encourages self-directed learning. In other words, TBL approach can be modified to encourage students to generate learning issues by themselves as in PBL (16). The current study showed a statistically significant difference between male and female students (P=0.025), male students thought that PBL sessions are beneficial in achieving learning objectives more than female.

Moreover, (43.9%) of the sample said that PBL allows in-depth understanding of the topics. Because it encourages students to think more deeply and offers some modeling of the types of questions students should be asking themselves during problem solving (12). Previous studies indicated that 56.8% reported that PBL is not effective without having a lecture on the same topic and the students wanted lectures before PBL session on the same topic (7) (9). By combining that with TBL, students are tested

individually and as a team to check their understanding of the reading assignments and prior knowledge. Teacher defines content for pre-class study based on knowledge required for application problems that will be given during the unit. Teacher decides, on the basis of the group test, which issues are not yet well understood (16).

(36.9%) of the sample thought that learning resources available for PBL sessions are not enough. Barman et al. (9) reported opposite finding, 50.9 % of students felt that enough learning resources were available for PBL sessions. Some students commented that they need computers connected to the internet in the college to facilitate searching. Students learn most effectively by using a variety of information resources. Therefore, provision of adequate resources meeting the needs of different learning styles is important (12).

There is a statistically significant difference between male and female students (P=0.001). Female believed that available learning resources for PBL sessions are not enough more than male. Reinforcing the importance of using data base provided by Qassim university and E-Library on website of dental school is highly recommended.

Group A & B agreed equally (51%) that PBL is stressful. Another study reported that 40% of the sample agreed with this result (9). Even that group A exposed to PBL and TBL but there isn't a statistically significant difference between the two groups, i.e. group A doesn't feel much stress than group B. This could be attributed to the different behavioral performance and learning style of the students in PBL classes (17).

According to the opinion of (65.6%), time allotted for the PBL session is enough. Some students commented that time is more than enough and they get bored in the sessions. Similar study showed that PBL was time consuming, and can be substituted by other instructional methods (23). Other study on the combined approach (TBL & PBL) reported 32 % found that TBL format was shorter than a PBL session, which was good because the PBL session felt too long for the content provided (24) .

72.2% of group A preferred PBL combined to TBL approach while only 27.8 % liked to learn through PBL only. They commented that the combination helped them to improve their grades in the blocks, break the learning routine and facilitate the understanding of the topic. This encourages us to investigate more and advanced learning approaches

and modify them to become applicable and useful within the limits of students' capabilities and adaptability, in order to improve the quality of learning process.

CONCLUSION:
Perception of dental students at Qassim College of dentistry regarding PBL-TBL combined approach was more positive than negative. It is a successful and interesting educational method. However, some improvements are required to provide students with stimulating favorable learning environment. It is necessary to supply and orient the students about available learning resources and manage the associated stresses. Moreover, students' recommendations and comments are very helpful as they showed high acceptance to the new learning styles. This acceptance motivates us to be updated with advanced learning strategies and modify them to be applicable and within the limits of students' capabilities, in order to improve the quality of learning process.

List of Abbreviations
PBL : Problem based learning
TBL : Team based learning

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