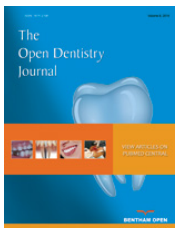
1874-2106/20 *Send Orders for Reprints to reprints@benthamscience.net*

692



The Open Dentistry Journal

Content list available at: https://opendentistryjournal.com

RESEARCH ARTICLE

Effectiveness of Peer Evaluation in Learning Process: A Case from Dental Technology Students

Noor Al Mortadi[1,*], Saed S. Al-Houry[2], Karem H. Alzoubi[3] and Omar F. Khabour[4]

[1]*Department of Applied Dental Sciences, Jordan University of Science and Technology, Irbid, Jordan*
[2]*Jerash Education Directorate, The Ministry of Education, Amman, Jordan*
[3]*Department of Clinical Pharmacy, Jordan University of Science and Technology, Irbid, Jordan*
[4]*Department of Medical Laboratory Sciences, Jordan University of Science and Technology, Irbid, Jordan*

Abstract:

Background:

Peer assessment or evaluation has been shown to play an important role in several learning processes. However, the effectiveness of this educational evaluation method has yet to be studied among students in different specialties.

Objective:

The study aimed to assess the effectiveness of peer evaluation as a method of student assessments in dental technology courses.

Methods:

The study sample (n=130 students) was randomly divided into 5 groups, then the effectiveness of peer evaluation was measured and correlated with student's Grade Point Average (GPA) and gender.

Results:

The results showed the ability of students to evaluate their peers in a certain course. As per students' perspective, scores ranged from 3.79-4.24 (out of 5), with a high degree of practice in all fields, ranked as follows: psychological stress, teamwork, self-efficacy, and, finally, the use of social media for learning. The mean score of all the categories in the peer assessment of students was 4.005 with a high degree of practice according to Scheffe's Test. Female gender was associated with significantly higher scores in the fields of psychosocial pressure, use of social media and overall scores. In addition, students achieving a GPA of 68 and more had significantly higher overall scores compared to students with lower GPAs.

Conclusion:

Peer evaluation seems to be a valid tool for students' assessment; thus, it can be recommended as part of the course grading system in dental technology courses and can be applied to other dental or medical courses that involve practical sessions.

Keywords: Peers evaluation, Learning process, Dental technology, Students, GPA, Teamwork.

Article History	Received: May 24, 2020	Revised: October 25, 2020	Accepted: November 13, 2020

1. INTRODUCTION

Specialists in public and private universities are interested in engaging students in the evaluation process, due to the effectiveness of this assessment method and the role it plays in achieving the academic and learning goals in the 21 century. Peer assessment is a system that focuses on full student integration into peer-to-peer learning under the supervision of their teacher [1]. Peer assessment has been shown to play an important role in several learning concepts such as peer learning, collaborative learning, and problem-solving skills [2]. In fact, engaging students for evaluating their learning (peer assessment) can significantly improve teaching and learning processes and students' ability of decision-making. Advocates of the implementation of peer assessment in an educational environment believe in the effectiveness of this method in improving the learning process [3 - 5]. For example, Topping (1998) highlighted the importance of peer assessment in enhancing the sense of responsibility, creating motivation and

* Address correspondence to the author at Department of Applied Dental Sciences, Faculty of Applied Medical Sciences, P.O. Box (3030) 22110, Irbid, Jordan; Tel: +962-2 -720 1000, E-mail: naalmortadi@just.edu.jo

acceptance of others, developing personal communication skills with intellectual activities, self-confidence, and good interaction with others [6]. In addition, Double *et al.*, (2020) reported the importance of peer assessment as an influential approach for improving the learning environment [7]. Li *et al.*, (2019) concluded that a positive relationship is built in the peer assessment among students, and identified the specific practices that embrace peer assessment and have a significant impact on students' performance [8]. They identified five-component rater training, rating format, rating criteria, and frequency of peer assessment, where rater training was the most critical factor of the components [8].

Although some studies have reported certain concerns about peer assessment [9], for example, Dochy *et al.*, (1999) indicated that peer assessment can be influenced by social factors such as friendships, collaboration, and perception of equality [10]. Similar concerns were reported in other studies [11 - 13]. These limitations can be overcome by randomly dividing the students in the learning environments, providing clear evaluation criteria and strong incentives for the students [14].

At the teacher level, the peer assessment method can be an effective way to monitor students' progress at regular intervals, reducing their burden and providing students with additional feedback [15].

Omelicheva (2005) examined the self-assessment of students and peer assessment in the university context. Two experiments were conducted in the classroom curriculum to test the effects of the evaluation tool (with evaluation criteria/ without evaluation criteria), the form of evaluation (anonymous, non-anonymous), and student's motivation (strong, weak) in peer assessment. The study findings showed both significant consistency of peer assessment in certain cases and the opposite in others. The findings showed that adding criteria to the evaluation significantly enhanced the reliability of peer assessment. A similar effect was observed when the students received incentives (being strongly motivated) to participate in peer assessment [14]. This could be an evidence of the enormous number of courses where the peer assessment is used. Students would choose to be engaged in only those courses with incentives for their participation, perhaps due to lack of time or unwillingness to participate in the study. Peer assessment has been revealed to be more accurate when rubrics are applied [16]. Peer assessment can encourage students to develop a critical attitude towards each other's professional behavior, encourage critical thinking and effective learning strategies [17, 18].

Peer assessment is utilized in various educational settings [19], including medical students [20 - 22], pharmacy students [23, 24], healthcare education [25 - 27] and in a combined group of medical and dentistry students [28]. It has also been extensively applied in medical evaluation to evaluate professional and communication skills [29, 30].

The peer evaluation method is not common in Jordan, as most of the evaluation is based on traditional methods that are centered on instructors. Previous studies report that peer assessment is rarely implemented in dental education, specifically in the operative dentistry field [11, 31, 32]. The purpose of the current study was to assess the effectiveness of peers' evaluation as a method of evaluation of students' academic performances in dental technology courses. There are limited studies on dentistry in Jordan. The study findings provide support to the importance of peer assessment and its impact on the evaluation of the educational process. Additionally, the results of this study might contribute to finding solutions to the challenges occurring in the evaluation of students' learning. Moreover, the study findings can be used as a model for other medical courses that involve practical sessions in Jordan.

2. METHODS

In this prospective cohort study, the effectiveness of peer evaluation was followed up in a group of dental technology students. This study received ethical approval from the Institutional Review Board of Jordan University of Science and Technology (IRB approval number is 73/117/2018). The study protocol was in compliance with the Helsinki Declaration of 1975, as revised in 1983.

2.1. Study Instrument

A number of questions were used as an instrument for this study. The total number of questions was twenty-three. Each question belonged to one of the four main categories (fields), including self-efficacy, teamwork, psychological effect, and the use of social media to impact learning (Tables **1** and **2**). A Five-level scale was used to score each question. The levels were defined as: (5) very distinct, (4) distinct, (3) good, (2) weak, (1) very weak. The questionnaire was face validated by soliciting the opinion of faculty members' arbitrators with expertise in the field of the study. Their comments were taken into consideration where the instrument was revised based on their opinions and suggestions. The questionnaires were then pilot tested on 10 dental technology students, who were not part of the final study sample. The students were encouraged to provide comments on how they understood each question in the instrument. Again, their comments were incorporated into the final study questionnaire.

Table 1. Persistence coefficient of the Pearson method and coefficient of stability of the instrument in the Alpha Cronbach's method.

Question Categories	Pearson correlation coefficient	Alpha Cronbach's coefficient
Self-efficacy	0.771**	0.752
Teamwork	0.761**	0.779
Psychological pressure	0.732**	0.842
The use of social media to impact learning	0.731**	0.878
The Total	0.812**	0.878

Table 2. The mean, SD and degree of practice for student's scores to their peers in 4 question categories.

Question Categories	Mean	SD	Degree of practice	Rank
Self-efficacy	3.94	0.54	High	3
Teamwork	4.05	0.51	High	2
Psychological pressure	4.24	0.49	High	1
Use of social media to impact learning	3.79	0.58	High	4
The Total	4.005	0.53	High	

Abbreviation: *SD: Standard deviation

2.2. Study Procedure

The sample of the study included 130 students. The inclusion criteria were a second-year undergraduate student enrolled in the dental technology course. No student enrolled in the course was excluded from the study. All students showed their willingness to participate in the study and signed the consent form of the study. The students received training sessions to evaluate their peers before conducting the study.

The students were randomly divided by the course instructor, using simple randomization, into studying groups (n=5/group) in an equal proportion to ensure the validity of the results of the study. Each group was asked to work on preparing an assignment for a specific topic and present it to all colleagues in the class. Every student was asked to assess his/her four colleagues in the same group. Few questions were related to the participation of the student in the stage of preparation of the assignment, while other questions were related to the participation of the student in the presentation of the assignment, which is mainly related to the presentation skills. The student assessment procedure was conducted by answering the twenty-three questions for each student using 1-5 scale (Table **3**).

2.3. Statistical Analysis

The Cronbach-Alpha coefficient was used to measure the accuracy and stability of the questions used. The stability coefficient was 0.897, which is considered high. Data were presented as Mean ± Standard deviation (SD) or rank. T-test for two independent samples was used according to variation per gender variable and one-way ANOVA for the cumulative average. "P". The Scheffe test was used to calculate the degree of practice and thus the values were divided into three levels; low level (1.0 -2.33), medium level (2.34-3.67) and high level (3.68-5.0). The Scheffe test was applied on each field of the questionnaire and a rank was given, according to the value of the degree of practice. Values were in the range of 1 to 6 for all fields, except psychological pressure, which was ranked between 1-5 (Table **2**). The mean and standard deviation (SD) for each statement was calculated for the study sample. The mean and SD for each field were also calculated based on the answers of all statements in each field (Table **3**).

Table 3. A detailed student's mean, SD, degree of practice, and rank within question categories.

Categories/Questions	Mean	SD	Degree of Practice	Rank Within Category
Self-efficacy				
Has a self-confidence	3.55	1.01	Medium	6
Has the ability to explain presentation in a convincing and distinct way	4.10	0.73	High	2
Has the ability to answer questions about the assessment in a scientific manner	4.06	0.79	High	3
Has the ability to convince the group of his decisions during discussion	3.89	0.98	High	4
Select difficult tasks during roles distribution on group members	3.96	0.82	High	5
Has the ability to learn new topic in a simplified and flexible way	4.11	0.92	High	1
Teamwork				
Cooperate and assist with all members of the group during preparation of the presentation	3.66	0.94	Medium	6
Respects his collogues in the group and accepts their opinions and suggestions	4.06	0.99	High	4
Has the capability to compatibility and integration during the preparation of the assignment with the group	3.69	0.94	High	5
Commits to works deadlines in delivering what is required	4.23	0.89	High	3
Communicate continuously with the rest of the group in teams of presentation	4.36	0.80	High	1
Work with the group	4.30	0.82	High	2
Psychological Pressure				
Has the ability to accomplish and challenge difficulties when exposed to psychological stress (pressure)	4.56	0.79	High	1
Has a fear of failure, which makes him perform the tasks assigned to him better	4.31	0.85	High	2
Has the ability to monitor his emotions the accumulation of tasks	4.26	0.92	High	3
Overcomes anxiety and tension felling's during the discussion of presentation	4.23	0.87	High	4
Has the ability not to show his emotions and social problems to group members	3.85	0.89	High	5
Use of Social Media				

(Table 3) contd.....

Categories/Questions	Mean	SD	Degree of Practice	Rank Within Category
Believes in the positive role of communication sites in constructive communication with group members	4.01	0.94	high	1
Learn about social network sites to enrich the assignment with the rest of the group	3.86	0.75	High	2
Devote part of his time to prepare to the assignment using social media	3.80	0.81	High	3
His cell phone is not used during discussions with group members	3.73	0.80	High	4
Urges colleagues to see social network sites to make progress of group members	3.72	1.06	High	5
Follow social network sites to keep in touch with everything new about presentation	3.63	0.94	Medium	6

Abbreviation: *SD: Standard deviation

Table 4. Scores of students' peer evaluation as per gender and GPA of the evaluated student.

Question Category	Gender			GPA			
	Male Mean±SD	Female Mean±SD	P-value	<68Mean±SD	68-<84 Mean±SD	≥84 Mean±SD	P-value
Self-efficacy	4.01±0.49	3.87±0.59	0.13	4.47±0.83	4.67±0.58	4.59±0.59	0.11
Working in team spirit	4.16±0.43	3.93±0.56	0.16	4.72±0.64	4.93±0.20	4.95±0.12	0.17
Psychological pressure	3.78±0.47	4.29±0.51	0.02*	4.68±0.65	4.85±0.27	4.90±0.20	0.25
Use of social media to impact learning	3.97±0.57	3.65±0.59	0.02*	4.70±0.55	4.89±0.24	4.93±0.15	0.41
The tool as a whole	3.70±0.40	4.10±0.44	0.03*	4.64±0.21	4.83±0.25#	4.83±0.23#	0.02

Note: *statistical function at the level of significance (P<0.05) using un-paired t-test. #statistical function at the level of significance (P<0.05) using one-way ANOVA.

3. RESULTS

The sample of the study consisted of 130 students, 68 males and 62 females. According to the Grade Point Average (GPA/100%), 37 students had a GPA of less than 68, whereas 47 students had a GPA of more than 68 to less than 84. Still, 41 students had a GPA of 84 and more. Table **2** shows an assessment of students' ability to evaluate their peers. As per students' perspective, their evaluation ability ranged from 3.79-4.24 in all fields of the questionnaire, which is considered a high degree of practice according to Scheffe test. According to the degree of practice, fields were ranked as follows: psychological stress, teamwork, self-efficacy, and the use of social media to impact learning. The overall mean of the four fields of the questionnaire was 4.005, with a high degree of practice.

Table **3** shows the scores for the ability of students to evaluate their peers in each of the after-mentioned fields. Within the self-efficacy field, scores ranged from 3.55 to 4.11 with a high degree of practice in all statements except self-confidence. For teamwork, scores ranged from 3.66-4.36 with a high degree of practice for all statements except "Cooperate and assist with all members of the group during preparation of the presentation". For psychological stress, scores ranged from 3.85 to 4.56 with a high degree of practice for all statements. Finally, for the use of social media, scores ranged from 3.63 to 4.01 with a high degree of practice for all statements except "Follow social network sites to keep in touch with everything new about presentation".

For the fields of psychosocial pressure, use of social media and overall scores, female gender was significantly associated with higher scores (Table **4**). For GPA, the overall scores were significantly higher among students with GPA scores of 68 and more compared to students with lower GPAs.

4. DISCUSSION

In the current study, a case of success of using peer assessment in a dental technology practical course was presented. The study findings showed a high overall mean of all categories of questions (4.005 out of 5) as per the students' perspectives. The study findings promote the use of peer assessment as an evaluation-tool for learning in the field of dental technology. This includes the implementing social control in the learning environment, the preparation of students for self-monitoring and self-regulation in lifelong learning, and the active participation of students in the classroom. The most well-known goal of peer assessment is its use as an evaluation tool. Recently, it has been increasingly encouraged for its role in promoting learning in educational practice [33].

Peer assessment has been reported as a tool to recognize active participation of students in their learning, and to create student-centered learning environments [34]. In fact, peer assessment represents a core part of theories of formative assessment since it has been viewed as providing new information about the learning process to the teacher/student, which sequentially empowers later performance [35]. Peer assessment is useful as a student engagement tool [26] and encourages lifelong learning [29].

The result of this study agrees with previous studies that reported the benefits of peer assessment to students [36, 37]. The benefits are classified as follows: high-quality learning, thus, encouraging the transfer of learning, thinking, enhancing students' learning experiences, providing students with a better understanding of evaluation standards, and eliminating ambiguity associated with assessment. Skills development *via* improving negotiation, student's ability to work in a collaborative way, and stimulating lifelong learning. Personal development, including increasing students' responsibility and the independence of the student. Emotional development *via*

increasing student's confidence, and autonomy [36, 37].

In a meta-analysis study that involved several peer assessment studies, peer assessment was found to resemble teacher assessment more closely when standard judgments based on well-understood criteria were used [38]. In the current study, it was noted that students' scores during peer-evaluation tended to be high. This is in agreement with a previous study that was conducted on pharmacy students [39]. The instructor made a lot of efforts to encourage students to do their best assessment. As for the quality of the assessed material, students were given a training session explaining how to do a proper peer evaluation. It was reported that conducting workshops to train students in assessing their peers improved the quality of feedback for the students [40]. However, bias from this side is still possible, which is one of the inherited limitations of the peer assessment method [41, 42].

In the present study, for the fields of psychosocial pressure, use of social media and overall scores, the results showed that the female gender was significantly associated with higher scores. In a previous study that examined the effect of gender on group work process and performance using the peer-assessment in the British higher education system, it was shown that male gender was associated with underperformance [43]. Similarly, a study that was conducted in two universities in Australia and included over 1500 students in four different degree programs, showed that females received significantly higher ratings than males [44]. Gender has also been found to have a role in peer assessment outcomes in other investigations [45, 46]. For GPA, the current study showed that a GPA of 68 and more was associated with significantly higher overall peer assessment scores compared to students with lower GPAs. Thus, both GPA and gender should be considered when using peer assessment approaches.

CONCLUSION

The present findings provide a case of successful peer assessment in dental technology practical courses. Thus, the recommendations are to promote the use of peer assessment method. Educational institutions should be encouraged to conduct teacher-training workshops, develop different evaluation processes for students, and focus on peer assessment. It is also necessary to make students know the importance of peer assessment and its role in the cooperative learning process and developing skills among students.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This study received ethical approval from the Institutional Review Board of Jordan University of Science and Technology, Jordan (IRB approval number is 73/117/2018).

HUMAN AND ANIMAL RIGHTS

No animals were used in this research. All human research procedures followed were in accordance with the ethical standards of the committee responsible for human experimentation (institutional and national), and with the Helsinki Declaration of 1975, as revised in 1983.

CONSENT FOR PUBLICATION

All patients participated on a voluntary basis and gave their informed consent.

AVAILABILITY OF DATA AND MATERIALS

The data supporting the findings of the article is available upon request from the corresponding author [N.M].

FUNDING

This study was supported by the Deanship of Research at Jordan University of Science and Technology, Jordan (Grant number: 440/2018).

CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

ACKNOWLEDGEMENTS

Declared none.

REFERENCES

[1] Thomas G, Martin D, Pleasants K. Using self- and peer-assessment to enhance students' future-learning in higher education. J Univ Teach Learn Pract 2011; 8.

[2] Kollar I, Fischer F. Peer assessment as collaborative learning: A cognitive perspective. Learn Instr 2010; 20: 344-8.

[3] Sluijsmans D, Brand-Gruwel S, Van Merrienboer JJG, Martens R. Training teachers in peer-assessment skills: Effects on performance and perceptions. Innov Educ Teach Int 2004; 41: 59-78.

[4] Bennett D, Kelly M, O'Flynn S. Framework for feedback: the peer mini-clinical examination as a formative assessment tool. Med Educ 2012; 46(5): 512.

[5] Rust C, Price M, O'Donovan B. Improving students' learning by developing their understanding of assessment criteria and processes. Assess Eval High Educ 2003; 28.

[6] Topping K. Review of educational research. Rev Educ Res 1998; 68: 249-76.

[7] Double K, McGrane J, Hopfenbeck T. The impact of peer assessment on academic performance: A meta-analysis of control group studies. Educ Psychol Rev 2020; 32.

[8] Li H, Xiong Y, Hunter C, Guo X, Tywoniw R. Does peer assessment promote student learning? A meta-analysis. Assess Eval High Educ 2019; 1-19.

[9] Alqassab M, Strijbos J-W, Ufer S. Training peer-feedback skills on geometric construction tasks: Role of domain knowledge and peer-feedback levels. Eur J Psychol Educ 2017; 33.

[10] Dochy F, Segers M, Sluijsmans D. The use of self-, peer and co-assessment in higher education: A review. Stud High Educ 1999; 24(3): 331-50.

[11] Satterthwaite J, Grey N. Peer-group assessment of pre-clinical operative skills in restorative dentistry and comparison with experienced assessors. European journal of dental education : official journal of the Association for Dental Education in Europe 2008; 12: 99-102.

[12] Brazeau C, Boyd L, Crosson J. Changing an existing OSCE to a teaching tool: The making of a teaching OSCE. Acad Med 2002; 77: 932.

[13] Harvey P, Higenbottam C, Owen A, Hulme J, Bion J. Peer-led training and assessment in basic life support for healthcare students: Synthesis of literature review and fifteen years practical experience. Resuscitation 2012; 83: 894-9.

[14] Omelicheva M. Self and peer evaluation in undergraduate education: Structuring conditions that maximize its promises and minimize the perils. J Polit Sci Educ 2005; 1: 191-205.

[15] Jones C. Assessment for Learning - UCL Institute of Education. Published by the Learning and Skills Development Agency 2005; pp. 19-35.https://dera.ioe.ac.uk/7800/1/AssessmentforLearning.pdf

[16] Panadero E, Alqassab M. An empirical review of anonymity effects in

peer assessment, peer feedback, peer review, peer evaluation and peer grading. Assess Eval High Educ 2019; 44: 1-26.

[17] Campbell J, Roberts M, Wright C, *et al.* Factors associated with variability in the assessment of UK doctors' professionalism: Analysis of survey results. BMJ 2011; 343: d6212.

[18] Papinczak T, Young L, Groves M. Peer assessment in problem-based learning: A qualitative study. Adv Health Sci Educ Theory Pract 2007; 12: 169-86.

[19] Zundert M, Sluijsmans D, Van Merrienboer JJG. Effective peer assessment processes: Research findings and future directions. Learn Instr 2010; 20: 270-9.

[20] Arnold L, Shue C, Kalishman S, *et al.* Can there be a single system for peer assessment of professionalism among medical students? A multi-institutional study. Acad Med 2007; 82: 578-86.

[21] Linn B, Arostegui M, Zeppa R. Peer and self assessment in undergraduate surgery. J Surg Res 1977; 21: 453-6.

[22] Rosendaal GMA, Jennett P. Comparing peer and faculty evaluations in an internal medicine residency. Acad Med 1994; 69: 299-303.

[23] O'Brien C, Franks A, Stowe C. Multiple rubric-based assessments of student case presentations. Am J Pharm Educ 2008; 72: 58.

[24] Wu K, Wagner L, Sheehan A. Pharmacy students' perceptions of and attitudes towards peer assessment within a drug literature evaluation course. Am J Pharm Educ 2012; 76: 62.

[25] Miller P, Nayer M, Eva K. Psychometric properties of a peer-assessment program to assess continuing competence in physical therapy. Phys Ther 2010; 90: 1026-38.

[26] Casey D, Burke E, Houghton C, *et al.* Use of peer assessment as a student engagement strategy in nurse education. Nurs Health Sci 2011; 13(4): 514-20.

[27] Davis J. Obstet Gynecol 2002; 99: 647-51.

[28] Nofziger AC, Naumburg EH, Davis BJ, Mooney CJ, Epstein RM. Impact of peer assessment on the professional development of medical students: a qualitative study. Acad Med 2010; 85(1): 140-7.

[29] Arnold L, Shue CK, Kalishman S, *et al.* Can there be a single system for peer assessment of professionalism among medical students? A multi-institutional study. Acad Med 2007; 82(6): 578-86.

[30] Kovach RA, Resch DS, Verhulst SJ. Peer assessment of professionalism: a five-year experience in medical clerkship. J Gen Intern Med 2009; 24(6): 742-6.

[31] Friedlander L, Anderson V. A New Predoctoral Endodontic Module: Evaluating Learning and Effectiveness. J Dent Educ 2011; 75: 351-9.

[32] Taylor C, Grey N, Satterthwaite J. A comparison of grades awarded by peer assessment, faculty and a digital scanning device in a pre-clinical operative skills course. European journal of dental education : official journal of the Association for Dental Education in Europe 2013; 17: e16-21.

[33] Wiliam D. How can assessment support learning? A response to wilson and shepard, penuel, and pellegrino. Educ Meas 2018; 37.

[34] Gielen S, Dochy F, Onghena P, Struyven K, Smeets S. Goals of peer assessment and their associated quality concepts. Stud High Educ 2011; 36: 1-17.

[35] Pellegrino JW, Chudowsky N, Glaser R. Knowing what students know: The science and design of educational assessment. Constitutions Avenue, NW, Lockbox 285, Washington, DC 20055: National Academy Press, 2102 2001.

[36] Falchikov N, Goldfinch J. Student peer assessment in higher education: A meta-analysis comparing peer and teacher marks. Rev Educ Res 2000; 70: 287-322.

[37] Sebba J, Crick R, Yu G, Lawson H, Harlen W, Durant K. Systematic review of research evidence of the impact on students in secondary schools of self and peer assessment. Technical report.Research Evidence in Education Library. London: EPPI-Centre, Social Science Research Unit, Institute of Education, University of London 2008.

[38] Falchikov N, Goldfinch J. Student peer assessment in higher education: A meta-analysis comparing peer and teacher marks. Rev Educ Res 2000; 70(3): 287-322.

[39] Wagner ML, Suh DC, Cruz S. Peer-and self-grading compared to faculty grading. Am J Pharm Educ 2011.

[40] Storjohann T, Raney E, Buckley K. Assessment of a Revised Method for Evaluating Peer-graded Assignments in a Skills-based Course Sequence. Am J Pharm Educ 2015; 79(8): 123.

[41] Azarnoosh M. Peer assessment in an EFL context: attitudes and friendship bias. Lang Test in Asia 2013; 3(1): 11.

[42] De Grez L, Valcke M, Roozen I. How effective are self-and peer assessment of oral presentation skills compared with teachers' assessments? Active Learn High Educ 2012; 13(2): 129-42.

[43] Takeda S, Homberg F. The effects of gender on group work process and achievement: an analysis through self□and peer□assessment. Br Educ Res J 2014; 40(2): 373-96.

[44] Tucker R. Sex does not matter: gender bias and gender differences in peer assessments of contributions to group work. Assess Eval High Educ 2014; 39(3): 293-309.

[45] Sasmaz Oren F. The effects of gender and previous experience on the approach of self and peer assessment: a case from Turkey. Innov Educ Teach Int 2012; 49(2): 123-33.

[46] Wheater CP, Langan AM, Dunleavy PJ. Students assessing student: case studies on peer assessment. Planet 2005; 15(1): 13-5.