Effective Teaching in a Medical Education Ph.D. Program: A Qualitative Study on the Perception of Faculty Members

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Abstract- Since the ancient times when human beings started to teach and learn, effective teaching is a matter of attention. In this regard, considering effective teaching in graduate courses and programs is critical and there are key points that must be considered by the faculty members and educational institutes. The present study is an attempt to investigate the experiences of faculty members of medical education regarding effective teaching in the medical education Ph.D. program offered in Iran. In this qualitative research, the study participants were faculty members of two national public medical universities of Iran who taught at the medical education centralized Ph.D. program developed by Iran Ministry of Health and Medical Education. The data were collected through semi-structured interviews and the gathered data were analyzed via conventional content analysis. The data analysis indicated five general categories including "the philosophy and characteristics of the Ph.D. program", "concept of effective teaching in the Ph.D. program", "facilitating factors of effective teaching and learning", "inhibiting factors of effective teaching" and "An educational design appropriate for the Ph.D. program". Based on the views of teachers of medical education, for effective teaching in this Ph.D. program there are diverse requirements such as familiarity with the philosophy, mission, vision, and characteristics of the program, facilitating and inhibiting factors of effective teaching and learning in the Ph.D. post-graduate program, and choosing an appropriate strategy to promote teaching and learning via the program. Based on the findings of this study, to conduct faculty development teacher training programs, training of medical instructors is not only an absolute need but also is severely recommended.

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Introduction

The primary mission of higher education is the enhancement of teaching and learning , which is mainly achieved through teaching (1). A major responsibility of faculty members is high-quality teaching through which they can provoke students and support them to increase their efficiency; more, using teaching as an invaluable tool for assisting the academic achievement of students (2). Various definitions have been put forth for teaching; some scholars define it as the process of transferring knowledge, and considering students as passive recipients (3) and depositors of knowledge (4). Whereas others consider teaching as organizing students' activities and viewing students as the main role-players in the teaching and learning process, and considering the teacher as facilitator and director of students to acquire knowledge (5). Yet, other views consider students as responsible bodies for creating knowledge, and the teacher as a mere facilitator of learning who directs students by using discovery learning and problem-solving (6). Teaching and learning are two sides of the same coin (7), and

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various studies have reported a significant relationship between the level of students' learning and teacher and course evaluation score; the higher the level of learning, the higher the evaluation score (8). However, there is no documented evidence supporting the superiority of teaching methods, content, and skills; while, one can claim that the teacher must possess certain teaching skills and use them based on students' needs and context (9) to create a setting for effective and desirable learning (10). By providing opportunities for effective learning, teachers facilitate it (11); therefore, by creating an environment that actively engages teachers and students, new cooperative knowledge will be formed, and the higher-level needs of students will be met (12). Effective teaching changes the students' behavior, thinking, and attitude which leads to their acquisition of new skills (13). In addition, teaching is effective when the art of teaching facilitates learning (14). Various qualitative and quantitative studies have shed light on different components of effective teaching or assessed these components from the point of view of teachers and students. However, to the best of our knowledge, there is no study examining the components of effective teaching from the perspective of medical education Ph.D. program instructors based on their educational experiences (15). Since investigating teaching effectiveness in different settings and programs is a multi-dimensional endeavor, we aimed to conduct a content analysis qualitative research to examine the perception of Ph.D. Instructors about effective teaching in a Medical Education Ph.D. Program.

Materials and Methods

In this qualitative study, the researchers collected data through semi-structured interviews with medical education Ph.D. program instructors at Iran and Shahid Beheshti Universities of Medical Sciences. The interviews were transcribed verbatim and analyzed via conventional content analysis.

Data collection and data analysis

At the beginning of the interview sessions, an information sheet was given to the faculty members, and the objectives of the study, voluntary participation and confidentiality of the data were explained to the study participants. After signing the informed consent form, the semi-structured interviews were conducted as the main data collection technique, which were recorded. Purposive sampling was continued until data saturation when no new pieces of data emerged.

Guided questions were designed in advance to cover all relevant areas that were of importance to the research purposes. The interviews were shaped by guided and probing questions emerging upon the interaction between the interviewers and the interviewee. During the interview sessions, the interviewer (HZ) maintained the relevance of the questions to the research objectives. Then, the interviews were transcribed verbatim. After each interview, the data were carefully read and re-read for several times, and first-level coding was attributed with an emphasis on manifest and implied content by identifying and highlighting units of analysis, sentences, and paragraphs. Each unit of analysis received a code, and the sub-codes were extracted. The research team (SB, HZH, and HH) reached a consensus on the extracted codes, and sub-codes. Subsequently, the codes were classified into categories and sub-categories based on their similarities and differences. and thus confirmed the process of data analysis. Moreover, immersion was reached via continuous long-term involvement with the data. The researchers constantly controlled the codes, and contradictions were resolved by discussion, if there were any.

Trustworthiness

To determine the trustworthiness of the study, four criteria of credibility, confirmability, dependability, and transferability were fulfilled. For credibility, the interviewers gained the participants trust by making a good rapport with them. The interview started with general question. For example, "Could you please tell us about your experiences of teaching at a Ph.D. level course?" Or "Could you please tell us about one of the most important characteristics of the course you taught that led to a better teaching experience?" For dependability, we asked the participants to review and accept the extracted codes. Afterwards, the data analysis process was examined by the research team. For triangulation, research methodology and extracted codes were checked with two experts of qualitative research and medical education. Also, by the 8-month engagement with the data, data immersion was fulfilled. To enhance transferability of findings, an external qualitative researcher analyzed the steps and data collection processes. One of the researchers (HH) was also asked to comment on the systematic implementation of study steps. For maximum variance sampling, the interviews with instructors from diverse universities, age ranges, academic ranks and positions, and both genders were carried out.

Results

The participants were eight medical education faculty members. Two of whom were full professors, four associate professors, and two assistant professors. (Table 1).

Data analysis indicated five broad categories related to the Ph.D. Program as: "philosophy and characteristics", "concept of effective teaching", "factors facilitating effective teaching", "factors inhibiting effective teaching", and "designing an appropriate teaching model".

Table 1. Demographics of the study participants

No.	University position	Academic rank	Work experience (Year)	Age	Sex
P1	**Director of Medical Education Department**	Professor	27	61	Male
P2	**Director of Community Medicine Department**	Professor	22	52	Male
P3	**Faculty Member of Medical Education**	Associate Professor	16	48	Female
P4	**Faculty Member of Ethics Department**	Assistant Professor	6	40	Male
P5	**Faculty Member of Medical Education Department**	Associate Professor	18	49	Male
P6	**Faculty Member of Medical Education Department**	Associate Professor	26	56	Male
P7	**Faculty Member of Medical Education Department**	Assistant Professor	6	43	Male
P8	**Director of Education Development Center (EDC)**	Professor	27	57	Female

The philosophy and characteristics of the Ph.D. program

In this category, the following five sub-categories were extracted: "The most important reason of the Ph.D. program", "training innovative researchers", "achieving scientific excellence", "creating an atmosphere for fostering scientific thinking and research", and "enrolling mentally matured and scientifically experienced learners" (Table 2).

According to the participant 7: "Students who enroll in this program have mastery over the basics of sciences, or they have work experience. They are pursuing this program to solve problems and respond to issues of their discipline or society". The participant 8 said, "This program trains elites and aims at science production". According to the participant 6: "We aim to train researchers who can share new insights with their discipline". The participant 3 mentioned, "We aim to teach learning methods and skills. In this program, we direct students." According to the participant 2: "This program has its unique characteristics, it's not like an ordinary class, here students are few, and there is rapport and close relationship between teacher and students."

The concept of effective teaching in a Ph.D. program

According to medical education teachers, teaching in postgraduate Ph.D. programs is different from teaching at undergraduate levels. The concept of effective teaching in this program can be classified into two sub-categories of training scholars in the discipline and competency-based teaching (Table 3).

The participant 1 said: "In this program, we should initially understand the purposes and reasons of its presentation, and to clarify which outcomes to expect and what skills we want our students reach" The participant 6 mentioned: "We must adhere to the written curriculum to see which capabilities are expected to be developed in the students." The participant 5 mentioned: "We should understand the global standards and try to achieve them." The participant 7 said: "For effective teaching in this program, teachers should have some inherent characteristics."

Factors facilitating effective teaching in the Ph.D. program

According to the study participants, the most important factors facilitating teaching can be classified into four categories of: pre-requisites of effective teaching, an educational system committed to the missions of the Ph.D. program, Ph.D. students committed to education and research and teachers committed to facilitating teaching in the Ph.D. program (Table 4).

Table 2. The philosophy and characteristics of the Ph.D. program

Open codes	Sub-category	Category	Main category
▪ Training scholars and experts, researchers, counselors, professors, theoreticians, and teachers capable of educational leadership ▪ Training creative scholars capable to expand knowledge, solve social problems, and provide initiatives for promotion ▪ Training self-reliant learners capable to do self-study and lifelong learning ▪ Training elites to solve problems and make efficient changes in the discipline ▪ Training students familiar with political, social, and cultural issues ▪ Teaching professionalism and academic ethics to Ph.D. graduates ▪ Training efficient learners or elites in the fields of teaching and management	The raison d'être (the most important reason) of the Ph.D. program	The philosophy of the Ph.D. program	The philosophy and characteristics of the Ph.D. program
▪ Teaching creative researchers to produce knowledge ▪ Teaching scholars and researchers in a scientific domain ▪ Teaching researchers who can use knowledge ▪ Writing an innovative dissertation, examining new insights, and completing the existing knowledge ▪ Mastery over knowledge of the discipline ▪ Changing perspectives and attitudes towards a specific scientific domain ▪ Providing opportunities for training elites who serve better than their professors	Training innovative researchers		
▪ Awareness of the boundaries of knowledge to complete science or resolve the deficiencies of existing dissertations ▪ Deep learning until the boundaries of critical sciences are reached and achieving critical thinking and problem-solving abilities ▪ Strengthening teaching, evaluation, and class management skills in Ph.D. students ▪ Achieving scientific mastery to the degree of evaluation and judgment ▪ Educating students as teachers ▪ Educating Ph.D. students at higher levels of Bloom's taxonomy with the ability to judge and criticize ▪ Increasing student-centeredness compared to Bachelor programs ▪ Major issues in the Ph.D. program, expressing problems and challenges, and the main issues of the discipline	Achieving scientific excellence		
▪ The opportunity to design a class appropriate for the characteristics of students, considering the small number of students in each class ▪ The small number of students as an opportunity for using the professors' experience ▪ Higher emphasis on research, compared to lower level programs ▪ Deep learning during writing a dissertation, and strengthening research skills ▪ Students' intensified learning in the research phase ▪ Teaching students about how to employ the taught theories in their real life	Creating an atmosphere of fostering scientific thinking and research	The characteristics of the Ph.D. program	
▪ ▪ Having experienced learners with teaching experience ▪ Having heterogeneous learners with different teaching experiences ▪ Having few students in the class ▪ Having the student reach a level of expertise by performing practical activities	Mentally mature and scientifically experienced learners		

Table 3. The concept of effective teaching in a Ph.D. program

Open codes	Sub-Category	Category
▪ **Paying attention to the philosophy and characteristics of the program**	Training scholars in the discipline	The concept of effective teaching in a Ph.D. program
▪ **Directing the path of teaching towards the objectives of the Ph.D. program**		
▪ **Triggering the minds of learners, developing an inquisitive mind, and examining topics extensively**		
▪ **Changing behaviors to meet the standards of the discipline**		
▪ **Responding to actual needs and solving the problems**	Competency-based teaching	
▪ **Achieving the capabilities specified in the curriculum**		
▪ **Having personal characteristics, recounting experiences, and planning**		

Table 4. Factors facilitating effective teaching and learning in the Ph.D. program

Open codes	Sub-Category	Category
▪ **Gaining experiences through observing the teaching of experienced professors**	pre-requisite of effective teaching and learning	Factors facilitating effective teaching in a Ph.D. program
▪ **Paying attention to the feedback from learners**		
▪ **Determining educational goals**		
▪ **Holding educational workshops for professors, and creating favorable educational conditions**		
▪ **Having an appropriate educational design to assist effective learning**		
▪ **Holding orientation workshops for first-year students to familiarize them with the expected responsibilities, goals, and capabilities of a Ph.D. graduate**		
▪ **Paying attention to educational equipment and physical-environmental factors**	An educational system committed to the missions of the Ph.D. program	
▪ **Considering the role of the environment in strengthening values or anti-values**		
▪ **Considering the supportive role of the educational system for commitment to values**		
▪ **Assisting the operationalization of research and solving educational problems**		
▪ **Paying attention to the environment, policies, and the program to assist effective teaching**		
▪ **Selecting experts**		
▪ **Providing students and professors an opportunity for growth and development**		
▪ **Educational supervision, and giving feedback to professors on their educational performance**		
▪ **Having the university missions in line with commitment to honoring and fostering capabilities of learners**		
▪ **Delegating authority and choice in selecting favorite courses**		
▪ **Encouraging students' commitment to equity and honesty**	Ph.D. students committed to education and research	
▪ **Reinforcing capability of critically reviewing scientific resources, evaluation, and promotion of the discipline**		
▪ **Viewing students as teaching assistants to the professors**		
▪ **Encouraging the students' knowledge-seeking attitude and speed of learning**		
▪ **Recognizing the role of students' active participation and deep learning**		
▪ **Encouraging students' patience in the learning process**		
▪ **Encouraging students' active participation in the learning process and reinforcing their motivation for learning**		

Cont. table 1

▪ **Professors' communication with other academic centers and their familiarity with the boundaries of knowledge in the field** ▪ **Creating a comfortable atmosphere for expressing opinions and teacher evaluation** ▪ **Creating conditions for students to participate in the learning process** ▪ **Commitment to teaching** ▪ **Giving the student a role in preparing the course content** ▪ **Giving students more responsibility for learning** ▪ **Assessing students' teaching and giving them feedback** ▪ **Providing undergraduate teaching opportunities for Ph.D. students** ▪ **Avoidance of a rival view toward a Ph.D. students** ▪ **Considering the Ph.D. student as a peer** ▪ **Collaborating with the Ph.D. students and considering the job done under the names of collaborators** ▪ **Considering educational dynamics instead of using a predominant and predefined framework** ▪ **Considering teacher-student rapport and believe in students as teacher assistants** ▪ **Avoiding instrumental view towards Ph.D. students** ▪ **Paying attention to learning styles of the students**	Teachers committed to facilitate teaching in the Ph.D. program

Participant 5 mentioned: "A young professor must start its work as an assistant to an experienced teacher, and gradually takes full responsibility of teaching in the Ph.D. program." Participant 4 said: "In this program, similar to other programs, the objective must be defined, and lesson plans must be developed." Participant 7 mentioned "We have to consider these questions: "Are the support, objectives, and mission of the educational system in line with those of this program? Does it pave the way for the progress of students and teachers?" Participant 8 said: "It matters whether the university aims for training elites, or it does not offer any support at all." Participant 5 mentioned: "Students contribute to the effectiveness of teaching. Are the students honest in teaching and conducting research? Do they seek knowledge? Are they actively engaged in the process, and can they enhance teaching effectiveness?"

Factors inhibiting effective teaching in the Ph.D. program

According to the study participants, the most important factors inhibiting effective teaching are unusual educational system, unlawful Ph.D. students, and uncommitted teachers who do not respect educational values (Table 5).

The participant 4 said: "We have no plans for training elites; maybe that's the reason for the brain-drain phenomenon". The participant 5 mentioned: "Sometimes we are so tied up in the rules and regulations of the system that we sacrifice the educational atmosphere vitality." Participant 6 said: "Students who cheat in fact damage the spirit of honesty. This means they haven't learned what they had to learn and haven't achieved the required capabilities. These students cheat and lie to pretend that they are capable, and I think it damages the spirit of education." The participant 8 mentioned: "Sometimes teachers cheat, too; when they don't transfer science and knowledge in the way they should, that is somehow a matter of fraud."

An educational design appropriate for the Ph.D. program

According to the study participants, an educational design appropriate for this program is classified into two sub-categories: attention to factors affecting the selection of teaching methods and designing interactive teaching methods (Table 6).

The participant 3 said: "Selection of a teaching method depends on the content, awareness of students, and what the students want to learn." The participant 7 mentioned: "I teach my theoretical classes in the form of two debate groups. I divide the students into two groups, and they have debates. I think this leads to a better learning and involves students in active learning." The participant 8 said: "Learners in this program differ from those studying at school, they play a role in their own learning. I pose a problem, and we discuss it in the next session." Participant 3 mentioned: "I assign the topic of the next week discussion. Each student presents part of the subject, and then we draw conclusions together."

Table 5. Factors inhibiting effective teaching in a Ph.D. program

Open codes	Sub-Category	Category
▪ **Dissociation between the motivation of students, professors, and the university** ▪ **An inflexible educational system that limits the professor-student relationship** ▪ **Rigid regulations of the educational system**	An abnormal educational system	Factors inhibiting effective teaching in a Ph.D. program
▪ **Killing the elites by suppressing students and diminishing their self-confidence** ▪ **Students' cheating and blemishing the value of honesty** ▪ **Valuing quantity instead of quality** ▪ **Misbehavior which blemishes the status of science**	unlawful Ph.D. students	
▪ **Professors' unpreparedness, lack of scientific trust, and dishonesty** ▪ **Keeping students behind** ▪ **Specialism and working in isolation instead of teamwork** ▪ **Viewing students as inferiors who merely write articles**	Teachers not committed to honoring educational values	

Table 6. An educational design appropriate for the Ph.D. program

Open codes	Sub-Category	Category
▪ **Learning conditions and atmosphere** ▪ **Educational curriculum** ▪ **Learners' meta-cognitive processes and prior experiences** ▪ **Educational content** ▪ **Learning domains** ▪ **Students' needs and wants** ▪ **Attention to the principles of adult learning**	Attention to factors affecting the selection of teaching methods	An educational design appropriate for the Ph.D. program
▪ **Presenting theories in the form of problems and scenarios and presenting models** ▪ **Using the debate method to teach theoretical courses, expressing positive and negative views, and drawing a conclusion with collaboration of students and teacher** ▪ **Using PBL and discussing the challenges** ▪ **Paying attention to adult learning, and using cooperative methods in teaching** ▪ **Holding journal clubs and conferences** ▪ **Having flipped classes and giving critical reviews of the resources** ▪ **Monitoring the students and explaining key points** ▪ **Having the students develop the materials and giving class presentations** ▪ **Holding interactive lectures** ▪ **Using mixed teaching methods appropriate for the content** ▪ **Expressing the problems and having question-and-answer sessions to guide the learners in solving the problem** ▪ **Teaching by using the master-novice method and gaining proficiency in the field**	Designing interactive teaching methods	

Discussion

According to the study participants who were faculty members of medical education, teachers must have mastery over the existential philosophy and characteristics of the Ph.D. program to develop appropriate models for effective teaching in this program. This program has been designed for training experts in the scientific discipline of medical education and its graduates must become competent in educational leadership, master communication skills to connect with other individuals and understand the needs of society, master project management, understand political and cultural issues, communicate with foreign scholars and researchers, and negotiate with professional partners (16). In other words, medical education teachers must train competent students with mastery over research, management, and entrepreneurship to meet the needs of society and their own discipline (17). A doctoral student must be a scholar, and scholarship of teaching and learning is the most important skill that they should acquire (18). Training such competent students requires an appropriate education that differs from a general educational program. In this program, teachers play a

major role in training capable Ph.D. students in line with the spirit of education; more, teachers are leaders who bring about change (19). In designing effective teaching, teachers must pay attention to factors influencing the selection of teaching methods, including the context and class environment, students' characteristics, learning styles and principles of adult learning. Due to the nature of this program, applying interactive teaching methods and creating challenges are among the best teaching methods that can be used. In fact, in this program, the challenging path is revealed, and the students are responsible for discovering the gap in science and making scientific breakthroughs in the discipline. This is in line with the findings of Keshmiri *et al*., who developed the Ph.D. Competency Framework in Health Professions Education, which consists of seven competency areas including Subject Matter Expertise, Research and Scholarship, Teaching, Interdisciplinary Collaboration, Leadership and Management, Professionalism, and Personal and Professional Development (20). In the study by Devlin, according to the students, the most important contributing factors to effective teaching were attentiveness to teaching styles; accessibility of teachers; teacher-student rapport; teacher's enthusiasm, devotion, and establishing teacher-student relationship, having communication skills, clearly explaining evaluation needs, and accelerating learning, which are consistent with the teachers' views about the effective teaching components (9). Preparing the pre-requisites of effective teaching, having an educational system committed to the missions of the Ph.D. program, and having committed students in the course-based or research-based Ph.D. programs are factors that facilitate effective teaching in this program. The educational system can institutionalize the missions of the Ph.D. program in teachers and facilitate the training of students in different scientific domains. The majority of professors noted a lack of institutional genuine support for the promotion of teaching, importance of research compared to excellence in teaching, and failing to provide opportunities for professional development as the most important challenges for effective teaching (21).

Based on the views of the study participants, for effective teaching in medical education Ph.D. programs, teachers must be familiar with the philosophy and characteristics of the program to train capable students. The educational system must build an environment appropriate for institutionalizing the mission of the Ph.D. program in teachers and facilitate the training of students as elites in different scientific domains under the umbrella of this program.

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References

1. Farmahini Farahani M, Ziaeiyan Alipour F. Faculty members' teaching quality based on the Mycourse scale from the student's viewpoint. Educ Strategies Med Sci 2012;5:157-61.
2. Tofoghiyan T, Monadi H, Nasrollahi S, Rakhshani M. Prioritization of the Effective Teaching Parameters Comparing the Viewpoints of Students and Teachers of Sabzevar University of Medical Sciences. Educ Strategies Med Sci 2015;8:1-6.
3. Carpenter JM. Effective teaching methods for large classes. J Fam Consum Sci Educ 2006;24:13-23.
4. Freire P. Pedagogy of the Oppressed. translated by MB Ramos London. London, England: Penguin Books; 1996.
5. Dent J, Harden RM, Hunt D. A practical guide for medical teachers. Amsterdam, Netherlands: Elsevier health sciences; 2017.
6. Johnson RT, Johnson DW. Active learning: Cooperation in the classroom. J-STAGE. The annual report of educational psychology in Japan 2008;47:29-30.
7. Roffey S. Pupil wellbeing—Teacher wellbeing: Two sides of the same coin? Educ Child Psychol 2012;29:8.
8. Theall M, Franklin J. Looking for bias in all the wrong places: a search for truth or a witch hunt in student ratings of instruction? New Dir Inst Res 2001;2001:45-56.
9. Devlin M, Samarawickrema G. The criteria of effective teaching in a changing higher education context. High Educ Res Dev 2010; 29:111-24.
10. Bjork E, Bjork R. Making things hard on yourself, but in a good way: Creating desirable difficulties to enhance learning. Psychology and the real world: Essays illustrating fundamental contributions to society. New York, NY, US: Worth Publishers; 2011.
11. Crose B. Internationalization of the higher education classroom: Strategies to facilitate intercultural learning and academic success. Int J Teach Learn High Educ 2011;23:388-95.
12. Keshavarzi M, Yarmohammadian MH, Nadi MA. Teaching methods based on futures studies development in Iran higher education curriculum. Iran Evol Educa Psychol J 2019;1:69-81.
13. Doyle T. Helping students learn in a learner-centered

environment: A guide to facilitating learning in higher education. Sterling, VA: Stylus Publishing, LLC; 2008.
14. Fenstermacher GD, Richardson V. On making determinations of quality in teaching. Teach Coll Rec 2005;107:186-213.
15. Carnell E. Conceptions of effective teaching in higher education: extending the boundaries. Teach High Educ 2007;12:25-40.
16. Barnes BJ, Williams EA, Archer SA. Characteristics that matter most: Doctoral students' perceptions of positive and negative advisor attributes. Nacada J 2010;30:34-46.
17. Melin G, Janson K. What skills and knowledge should a Ph.D. have? Changing preconditions for Ph.D. education and post doc work. Wenner Gren International Series 2006;83:105-18.
18. Mirhosseini F, Mehrdad N, Bigdeli S, Peyravi H, Khoddam H. Exploring the concept of scholarship of teaching and learning (SoTL): Concept analysis. Med J Islam Repub Iran 2018;32:96.
19. Bigdeli S, Boushehri E, Biabangardy Z. Global medical teacher. Procedia Soc Behav Sci 2012;47:1981-4.
20. Keshmiri F, Gandomkar R, Mortaz Hejri S, Mohammadi E, Mirzazadeh A. Developing a competency framework for health professions education at doctoral level: the first step toward a competency based education. Med Teach 2019;41:1298-306.
21. Kember D, McNaught C. Enhancing university teaching: Lessons from research into award-winning teachers. Oxfordshire: Routledge; 2007.