



Effective teaching methods in higher education: requirements and barriers

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Abstract

Introduction: Teaching is one of the main components in educational planning which is a key factor in conducting educational plans. Despite the importance of good teaching, the outcomes are far from ideal. The present qualitative study aimed to investigate effective teaching in higher education in Iran based on the experiences of best professors in the country and the best local professors of Isfahan University of Technology.

Methods: This qualitative content analysis study was conducted through purposeful sampling. Semi-structured interviews were conducted with ten faculty members (3 of them from the best professors in the country and 7 from the best local professors). Content analysis was performed by MAXQDA software. The codes, categories and themes were explored through an inductive process that began from semantic units or direct quotations to general themes.

Results: According to the results of this study, the best teaching approach is the mixed method (student-centered together with teacher-centered) plus educational planning and previous readiness. But whenever the teachers can teach using this method confront with some barriers and requirements; some of these requirements are prerequisite in professors' behavior and some of these are prerequisite in professors' outlook. Also, there are some major barriers, some of which are associated with the professors' operation and others are related to laws and regulations. Implications of these findings for teachers' preparation in education are discussed.

Conclusion: In the present study, it was illustrated that a good teaching method helps the students to question their preconceptions, and motivates them to learn, by putting them in a situation in which they come to see themselves as the authors of answers, as the agents of responsibility for change. But training through this method has some barriers and requirements. To have an effective teaching; the faculty members of the universities should be awarded of these barriers and requirements as a way to improve teaching quality. The nationally and locally recognized professors are good leaders in providing ideas, insight, and the best strategies to educators who are passionate for effective teaching in the higher education. Finally, it is supposed that there is an important role for nationally and locally recognized professors in higher education to become more involved in the regulation of teaching rules.

Keywords: Teaching; Higher education; Requirements; Barriers; Qualitative research

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Introduction

Rapid changes of modern world have caused the Higher Education System to face a great variety of challenges. Therefore, training more eager, thoughtful individuals in interdisciplinary fields is required (1). Thus, research and exploration to figure out useful and effective teaching and learning methods are one of the most important necessities of educational systems (2); Professors have a determining role in training such people in the mentioned field (3). A university is a place where new ideas germinate; roots strike and grow tall and sturdy. It is a unique space, which covers the entire universe of knowledge. It is a place where creative minds converge, interact with each other and construct visions of new realities. Established notions of truth are challenged in the pursuit of knowledge. To be able to do all this, getting help from experienced teachers can be very useful and effective.

Given the education quality, attention to students' education as a main product that is expected from education quality system is of much greater demand in comparison to the past. There has always been emphasis on equal attention to research and teaching quality and establishing a bond between these two before making any decision; however, studies show that the already given attention to research in universities does not meet the educational quality requirements.

Attention to this task in higher education is considered as a major one, so in their instruction, educators must pay attention to learners and learning approach; along with these two factors, the educators should move forward to attain new teaching approaches. In the traditional system, instruction was teacher-centered and the students' needs and interests were not considered. This is when students' instruction must change into a method in which their needs are considered and as a result of the mentioned method active behavior change occurs in them (4). Moreover, a large number of graduated students especially bachelor

holders do not feel ready enough to work in their related fields (5). Being dissatisfied with the status quo at any academic institution and then making decision to improve it require much research and assistance from the experts and pioneers of that institute. Giving the aforementioned are necessary, especially in present community of Iran; it seems that no qualitative study has ever been carried out in this area drawing on in-depth reports of recognized university faculties; therefore, in the present study the new global student-centered methods are firstly studied and to explore the ideas of experienced university faculties, some class observations and interviews were done. Then, efficient teaching method and its barriers and requirements were investigated because the faculty ideas about teaching method could be itemized just through a qualitative study.

Methods

The study was conducted with a qualitative method using content analysis approach. The design is appropriate for this study because it allows the participants to describe their experiences focusing on factors that may improve the quality of teaching in their own words. Key participants in purposeful sampling consist of three nationally recognized professors introduced based on the criteria of Ministry of Science, Research and Technology (based on education, research, executive and cultural qualifications) and seven other locally recognized professors according to Isfahan University of Technology standards and students votes. The purposive sampling continued until the saturation was reached, i.e. no further information was obtained for the given concept. All the participants had a teaching experience of above 10 years (Table1). They were first identified and after making appointments, they were briefed about the purpose of the study and they expressed their consent for the interview to be performed. The lack of female nationally recognized professors among respondents (due to lack of them) are

Table1: The participants' characteristics

Participants	Age (years)	Gender	Working history (years)	Working fields
1	68	Male	27	Agriculture
2	46	Male	14	Agriculture
3	62	Male	25	Civil engineering
4	45	Male	14	Chemistry
5	45	Male	12	Chemistry
6	49	Male	18	Chemistry
7	63	Male	23	Physics
8	65	Male	26	Physics
9	62	Male	24	Materials engineering
10	48	Male	16	Mathematics

restrictions of this research.

The data were collected using semi-structured in-depth interviews. Interviews began with general topics, such as “*Talk about your experiences in effective teaching*” and then the participants were asked to describe their perceptions of their expertise. Probing questions were also used to deeply explore conditions, processes, and other factors that the participants recognized as significant. The interview process was largely dependent on the questions that arose in the interaction between the interviewer and interviewees.

In the process of the study, informed consent was obtained from all the participants and they were ensured of the anonymity of their responses and that the audio files will be removed after use; then, after obtaining permission from the participants, the interview was recorded and transcribed verbatim immediately. The interviews were conducted in a private and quiet place and in convenient time. Then, verification of documents and coordination for subsequent interviews were done. The interviews lasted for one hour on average and each interview was conducted in one session with the interviewer’s notes or memos and field notes. Another method of data collection in this study was an unstructured observation in the educational setting. The investigator observed the method of interactions among faculty members and students. The interviews were conducted from November 2014 to April 2015. Each participant was interviewed for one or two sessions. The mean duration of the interviews was 60 minutes. To analyze the data, we used MAXQDA software (version 10, package series) for indexing and charting. Also, we used qualitative content analysis with a conventional approach to analyze the data. The data of the study were directly collected from the experiences of the study participants. The codes, categories and themes were explored through an inductive process, in which the researchers moved from specific to general. The consequently formulated concepts or categories were representative of the participants’ experiences. In content analysis at first, semantic units should be specified, and then the related codes should be extracted and categorized based on their similarities. Finally, in the case of having a high degree of abstraction, the themes can be determined. In the conventional approach, the use of predetermined classes is avoided and classes and their names are allowed to directly come out of the data. To do so, we read the manuscripts and listened to the recorded data for several times until an overall sense was attained. Then, the manuscript was read word

by word and the codes were extracted. At the same time, the interviews were continued with other participants and coding of the texts was continued and sub-codes were categorized within the general topics. Then, the codes were classified in categories based on their similarities (6). Finally, by providing a comprehensive description about the topics, participants, data collection and analysis procedures and limitations of the study, we intend to create transferability so that other researchers clearly follow the research process taken by the researchers.

Rigor

To improve the accuracy and the rigor of the findings, Lincoln and Cuba’s criteria, including credibility, dependability, conformability, and transferability, were used (7). To ensure the accuracy of the data, peer review, the researchers’ acceptability, and the long and continuing evaluation through in-depth, prolonged, and repeated interviews and the colleague’s comments must be used (8). In addition, the findings were repeatedly assessed and checked by supervisors (expert checking) (9). In this research, the researcher tried to increase the credibility of the data by keeping prolonged engagement in the process of data collection. Then, the accuracy of data analysis was confirmed by one specialist in the field of qualitative research and original codes were checked by some participants to compare the findings with the participants’ experiences. To increase the dependability and conformability of data, maximum variation was observed in the sampling. In addition, to increase the power of data transferability, adequate description of the data was provided in the study for critical review of the findings by other researchers.

Ethical considerations

The aim of the research and interview method was explained to the participants and in the process of the study, informed consent was obtained from all the participants and they were ensured of the anonymity of their responses and that audio files were removed after use. Informed consent for interview and its recording was obtained.

Results

The mean age of faculty members in this study was 54.8 years and all of them were married. According to the results of the study, the best teaching approach was the mixed method one (student-centered with teacher-centered) plus educational planning and previous readiness. Meaning units expressed by professors were divided into 19 codes, 4 categories and 2 themes. In

the present study, regarding the Effective Teaching Method in Higher Education, Requirements and Barriers, the experiences and perceptions of general practitioners were explored. As presented

in Table 2, according to data analysis, two themes containing several major categories and codes were extracted. Each code and category is described in more details below.

Table 2: Examples of extracting codes, categories and themes from raw data

Meaning unit	Code	Category	Theme
<i>"If faculties know themselves as an inseparable part of the university, and proud of their employment in the university ..."</i>	• Alignment with organizational strategies	Pre-requisite in professors outlook	Requirements
<i>"... Trust in their ability and pay obeisance to them are the motivating factors for students"</i>	• Interest in students and trust in their ability	Pre-requisite in professors outlook	Requirements
<i>"... These students are the future of country and in addition to knowledge, they should provide them with the right attitude and vision"</i>	• Systemic approach in higher education	Pre-requisite in professors outlook	Requirements
<i>"If a teacher is interested in his field, he devotes more time to study the scriptures of his field and regularly updates his information..."</i>	• Interest in their study field	Pre-requisite in professors outlook	Requirements
<i>"The fact that many teachers don't have a predetermined plan on how to teach, and ..., is one reason for the lack of creativity in teaching"</i>	• Having lesson plan, using appropriate educational strategies	Pre-requisite in professors outlook	Requirements
<i>"I always pay attention to my role as a model with regular self-assessment; I'm trying to teach this main issue to my students"</i>	• Meta cognition training and self-assessment of students during teaching	Pre-requisite in professors outlook	Requirements
<i>"I always give a five to ten-minute summary of the last topic to students at first, and if the previous lessons can be linked to the new course, I connect them"</i>	• Using concept maps and pre organizer of teaching	Pre-requisite in professors outlook	Requirements
<i>"It is important that what is taught be relevant to the students' career..."</i>	• Knowledge and explanation of how to resolve problems in professional career through teaching topics	Pre-requisite in professors outlook	Requirements
<i>"I have a notebook; ... I write down every successful strategy that was highly regarded by students that day"</i>	• Documenting experiences	Pre-requisite in professors' behavior	Requirements
<i>"... Every time when I see a student in class is not focused on a few consecutive sessions, I ask about his lack of focus and I help him solve his problem"</i>	• Having satisfactory interaction with students	Pre-requisite in professors' behavior	Requirements
<i>"The need for student-centered teaching is obvious, but for some reasons, such as the requirement in the teaching curriculum and the large volume of materials and resources, the possibility of using these methods is not feasible completely"</i>	• Masters' lack of notice from the benefits and how to implement accurate and complete student-centered methods	Associated with the professor	Barriers
<i>"The fact that many teachers don't have a predetermined plan on how to teach, and just collect what they should teach in a meeting, is one reason for the lack of creativity in teaching"</i>	• The lack of having a predetermined program and, if possible, creative presentation by masters	Associated with the professor	Barriers
<i>"I think one of the ways that can make student-centered education possible is employing educational assistants"</i>	• Do not use of educational assistants	Associated with the professor	Barriers
<i>"If each professor could attend crowded classes with two or three assistants, they could divide the class into some groups and assign more practical teamwork while they were carefully supervised"</i>	• Lack of interest and lack of motivation among students	Associated with the professor	Barriers
<i>"After the students could see themselves capable of solving the problems and being more involved, they could develop more motivation, metacognition and self- confidence"</i>	• Masters' lack of notice from meta cognition importance and necessity of teaching it to students	Associated with the professor	Barriers
<i>"The need for student-centered teaching is obvious, but for some reasons, such as the requirement in the teaching curriculum and large number of students in classes, the large volume of materials and resources, the use of these methods is not feasible completely"</i>	• The requirements defined curriculum and resources in the teaching. The large number of students in classes. High volume theoretical principles	Associated with laws and regulations	Barriers
<i>"If at least in the form of teacher evaluation, some questions were allocated to the use of project-based and problem-based approaches, and student-centered learning, teachers would try to use them further"</i>	• Do not take a problem-based learning and student-centered learning in their evaluation as a bonus for teachers	Associated with laws and regulations	Barriers

New teaching methods and barriers to the use of these methods

Teachers participating in this study believed that teaching and learning in higher education is a shared process, with responsibilities on both student and teacher to contribute to their success. Within this shared process, higher education must engage the students in questioning their preconceived ideas and their models of how the world works, so that they can reach a higher level of understanding. But students are not always equipped with this challenge, nor are all of them driven by a desire to understand and apply knowledge, but all too often aspire merely to survive the course, or to learn only procedurally in order to get the highest possible marks before rapidly moving on to the next subject. The best teaching helps the students to question their preconceptions, and motivates them to learn, by putting them in a situation in which their existing model does not work and in which they come to see themselves as authors of answers, as agents of responsibility for change. That means, the students need to be faced with problems which they think are important. Also, they believed that most of the developed countries are attempting to use new teaching methods, such as student-centered active methods, problem-based and project-based approaches in education. For example, the faculty number 3 said:

"In a project called EPS (European Project Semester), students come together and work on interdisciplinary issues in international teams. It is a very interesting technique to arouse interest, motivate students, and enhance their skills (Faculty member No. 3)."

The faculty number 8 noted another project-based teaching method that is used nowadays especially to promote education in software engineering and informatics is FLOSS (Free/Liber Open Source Software). In recent years, this project was used to empower the students. They will be allowed to accept the roles in a project and, therefore, deeply engage in the process of software development.

In Iran, many studies have been conducted about new teaching methods. For example, studies by Momeni Danaie (10), Noroozi (11), and Zarshenas (12), have shown various required methods of teaching. They have also concluded that pure lecture, regardless of any feedback ensuring the students learning, have lost their effectiveness. The problem-oriented approach in addition to improving communication skills among students not only increased development of critical thinking but also promoted study skills and an interest in their learning (12).

In this study, the professors noted that there are some barriers to effective teaching that are mentioned below:

- **The requirements defined curriculum and resources in the teaching, the large number of students in classes, and High volume theoretical principles**

As to the use of new methods of training such as problem-based methods or project-based approach, faculty members No. 4 and 9 remarked that *"The need for student-centered teaching is obvious but for some reasons, such as the requirement in the teaching curriculum and the large volume of materials and resources, using these methods is not feasible completely"* (Faculty member No. 9).

- **Do not take a problem-based learning and student-centered learning in their evaluation as a bonus for teachers**

"If at least in the form of teacher evaluation, some questions were allocated to the use of project-based and problem-based approaches, teachers would try to use them further" (Faculty member No. 2).

- **Do not use educational assistants**

The faculty members No. 6 and 7 believed that the lack of motivation in students and the lack of access to educational assistants are considered the reasons for neglecting these methods.

"I think one of the ways that can make student-centered education possible is employing educational assistants (Faculty member No. 6)."

- **Lack of interest and motivation among students**

"If each professor could attend crowded classes with two or three assistants, they could divide the class into some groups and assign more practical teamwork while they were carefully supervised (Faculty member No. 7)."

Requirements related to faculty outlook in an effective teaching

Having a successful and effective teaching that creates long-term learning on the part of the students will require certain feelings and attitudes of the teachers. These attitudes and emotions strongly influence their behavior and teaching. In this section, the attitudes of successful teachers are discussed.

- **Alignment with organizational strategies**

Coordination with the overall organizational strategies will allow the educational system to move toward special opportunities for innovation based on the guidelines (13). The participants, 4, 3, 5 and 8 know that teaching effectively makes sense if the efforts of the professors are aligned with the goals of university.

“If faculty members know themselves as an inseparable part of the university, and proud of their employment in the university and try to promote the aim of training educated people with a high level of scientific expertise of university, it will become their goal, too. Thus, they will try as much as possible to attain this goal” (Faculty member No.9).

• **Interested in students and trust in their ability**

When a person begins to learn, according to the value of hope theory, he must feel this is an important learning and believe that he will succeed. Since the feeling of being successful will encourage individuals to learn, you should know that teachers have an important role in this sense (14). The interviewees' number 1, 2, 3 and 10 considered factors like interest in youth, trust in ability and respect, as motivating factors for students.

• **Systemic approach in higher education**

Masters 7 and 8 signified that a master had a holistic and systematic view, determined the position of the teaching subject in a field or in the entire course, know general application of issues and determines them for students, and try to teach interdisciplinary topics. Interviewee No. 5 believed that: *“Masters should be aware of the fact that these students are the future of the country and in addition to knowledge, they should provide them with the right attitude and vision”* (Faculty member No.5).

• **Being interested in the scientific field of study**

Participants No. 2, 4 and 8 considered the faculty members' passion to teach a lesson as responsible and believed that: *“If the a teacher is interested in his field, he/she devotes more time to study the scriptures of his field and regularly updates his information; this awareness in his teaching and its influence on students is also very effective”*(Faculty member No. 8).

Requirements related to the behavior and performance of faculty members in effective teaching

Teachers have to focus on mental differences, interest, and sense of belonging, emotional stability, practical experience and scientific level of students in training. Class curriculum planning includes preparation, effective transition of content, and the use of learning and evaluating teaching (15).

Given the current study subjects' ideas, the following functional requirements for successful teaching in higher education can be proposed.

• **Having a course plan, using appropriate**

educational strategies

According to Choi and Pucker, the most important role of teachers is planning and controlling the educational process for students to be able to achieve a comprehensive learning (16).

“The fact that many teachers don't have a predetermined plan on how to teach, and just collect what they should teach in a meeting is one reason for the lack of creativity in teaching” (Faculty member No.4).

Klug and colleagues in an article entitled “teaching and learning in education” raise some questions and want the faculty members to ask themselves these questions regularly.

1. How to increase the students' motivation.
2. How to help students feel confident in solving problems.
3. How to teach students to plan their learning activities.
4. How to help them to carry out self-assessment at the end of each lesson.
5. How to encourage the students to motivate them for future work.

6. How I can give feedback to the students and inform them about their individual learning (14).

• **Metacognition training and self-assessment of students during teaching.**

Every five faculty members who were interviewed cited the need to explain the lessons in plain language, give feedback to students, and explain the causes and reasons of issues.

“I always pay attention to my role as a model with regular self-assessment; I'm trying to teach this main issue to my students” (Faculty member No. 9).

• **Using conceptual map and pre-organizing plan in training**

Improving the quality of learning through the promotion of education, using pre-organizers and conceptual map, emphasizing the student-centered learning and developing the skills needed for employment are the strategies outlined in lifelong learning, particularly in higher education (17).

“I always give a five to ten-minute summary of the last topic to students at first; if possible, I build up the new lesson upon the previous one” (Faculty member No. 4).

• **Encouraging creativity during teaching the lessons**

The belief that creative talent is universal and it will be strengthened with appropriate programs is a piece of evidence to prove that innovative features of the programs should be attended to continually (18). Certainly, in addition to the enumerated powers, appropriate fields should be provided to design new ideas with confidence

and purposeful orientation. Otherwise, in the absence of favorable conditions and lack of proper motivations, it will be difficult to apply new ideas (19). Teacher's No. 3, 5 and 7 emphasized encouraging the students for creativity: *"I always encourage the students to be creative when I teach a topic; for example, after teaching, I express some vague hints and undiscovered issues and ask them what the second move is to improve that process"* (Faculty member No.3).

• **Explaining and developing knowledge on how to resolve the issues in future career through class discussion.**

Senior instructors try to engage in self-management and consultation, tracking their usage of classroom management skills and developing action plans to modify their practices based on data. Through consultation, instructors work with their colleagues to collect and implement data to gauge the students' strengths and weaknesses, and then use protocols to turn the weaknesses into strengths. The most effective teachers monitor progress and assess how their changed practices have impacted the students' outcomes (20).

"It is important that what is taught be relevant to the students' career; however, in the future with the same information they have learned in university, they want to work in the industry of their country" (Faculty member No. 1).

• **Documenting experiences**

Skills in documenting the results of the process of teaching-learning cannot only facilitate management in terms of studying the records, but also provides easier access to up to date information (21). Faculty members No. 7 and 3 stressed the need for documenting learning experiences by faculty.

"I have a notebook in my office that I usually refer to after each class. Then, I write down every successful strategy that was highly regarded by students that day" (Faculty member No.3).

Developing a satisfactory interaction with students

To connect with students and impact their lives personally and professionally, teachers must be student-centered and demonstrate respect for their background, ideologies, beliefs, and learning styles. The best instructors use differentiated instruction, display cultural sensitivity, accentuate open communication, offer positive feedback on the students' academic performance (20), and foster student growth by allowing them to resubmit assignments prior to assigning a grade (22).

"I pay attention to every single student in my class and every time when I see a student in class

is not focused on a few consecutive sessions, I ask about his lack of focus and I help him solve his problem" (Faculty member No. 5).

The limitation in this research was little access to other nationally recognized university faculty members; also their tight schedule was among other limitations in this study that kept us several times from interviewing such faculties. To overcome such a problem, they were briefed about the importance of this study and then some appointments were set with them.

Discussion

This study revealed the effective teaching methods, requirements and barriers in Iranian Higher Education. Teachers participating in this study believed that teaching and learning in higher education is a shared process, with responsibilities on both student and teacher to contribute to their success. Within this shared process, higher education must engage the students in questioning their preconceived ideas and their models of how the world works, so that they can reach a higher level of understanding. They believed that to grow successful people to deal with the challenges in evolving the society, most developed countries are attempting to use new teaching methods in higher education. All these methods are student-centered and are the result of pivotal projects. Research conducted by Momeni Danaei and colleagues also showed that using a combination of various teaching methods together will lead to more effective learning while implementing just one teaching model cannot effectively promote learning (10). However, based on the faculty member's experiences, effective teaching methods in higher education have some requirements and barriers.

In this study, barriers according to codes were divided two major categories: professor-related barriers and regulation-related ones; for these reasons, the complete use of these methods is not possible. However, teachers who are aware of the necessity of engaging the student for a better understanding of their content try to use this method as a combination that is class speech presentation and involving students in teaching and learning. This result is consistent with the research findings of Momeni Danaei and colleagues (10), Zarshenas et al. (12) and Noroozi (11).

Using student-centered methods in higher education needs some requirements that according to faculty members who were interviewed, and according to the codes, such requirements for effective teaching can be divided into two categories: First, things to exist

in the outlook of faculties about the students and faculties' responsibility towards them, to guide them towards effective teaching methods, the most important of which are adaptation to the organizational strategies, interest in the students and trust in their abilities, systemic approach in higher education, and interest in their discipline.

Second, the necessary requirements should exist in the faculties' behavior to make their teaching methods more effective. This category emerged from some codes, including having lesson plan; using appropriate educational strategies and metacognition training and self-assessment of students during teaching; using concept and pre-organizer maps in training, knowledge; and explaining how to resolve problems in professional career through teaching discussion, documenting of experience and having satisfactory interaction with the students. This result is consistent with the findings of Klug et al., Byun et al., and Khanyfr et al. (14, 17, 18).

In addition and according to the results, we can conclude that a major challenge for universities, especially at a time of resource constraints, is to organize teaching so as to maximize learning effectiveness. As mentioned earlier, a major barrier to change is the fact that most faculty members are not trained for their teaching role and are largely ignorant of the research literature on effective pedagogy. These findings are in agreement with the research of Knapper, indicating that the best ideas for effective teaching include: Teaching methods that focus on the students' activity and task performance rather than just acquisition of facts; Opportunities for meaningful personal interaction between the students and teachers; Opportunities for collaborative team learning; More authentic methods of assessment that stress task performance in naturalistic situations, preferably including elements of peer and self-assessment; Making learning processes more explicit, and encouraging the students to reflect on the way they learn; Learning tasks that encourage integration of information and skills from different fields (23).

Conclusion

In the present study, it was illustrated that a good teaching method helps the students to question their preconceptions, and motivates them to learn, by putting them in a situation in which they come to see themselves as the authors of answers and the agents of responsibility for change. But whenever the teachers can teach by this method, they are faced with some barriers and requirements. Some of these requirements are

prerequisite of the professors' behavior and some of these are prerequisite of the professors' outlook. Also, there are some major barriers some of which are associated with the professors' behavior and others are related to laws and regulations. Therefore, to have an effective teaching, the faculty members of universities should be aware of these barriers and requirements as a way to improve the teaching quality.

Effective teaching also requires structural changes that can only be brought about by academic leaders. These changes include hiring practices reward structures that recognize the importance of teaching expertise, quality assurance approaches that measure learning processes, outcomes in a much more sophisticated way than routine methods, and changing the way of attaining university accreditation.

The nationally and locally recognized professors are good leaders in providing ideas, insight, and the best strategies to educators who are passionate for effective teaching in the higher education. Finally, it is supposed that there is an important role for nationally and locally recognized professors in higher education to become more involved in the regulation of teaching rules. This will help other university teachers to be familiar with effective teaching and learning procedures. Therefore, curriculum planners and faculty members can improve their teaching methods.

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