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Analysis of the some effective teaching quality factors within faculty members of agricultural and natural resources colleges in Tehran University



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Abstract Agricultural higher education institutions have a significant role in development of the agriculture sector and the effectiveness of higher education is dependent on the quality of teaching offered by its faculty members. The purpose of this study was to determine and classify factors related to teaching quality by members of a scientific board. The method of evaluation for this research was by evaluation of data from a descriptive survey taken with a researcher made questionnaire. The target population of the study consisted of 256 faculty members in agricultural colleges in Tehran University. A sample of 100 staff was selected through a randomized multi-stage sampling method based on the Koukran formula. The questionnaire, used as the research tool, was verified by a panel of experts. The reliability of the questionnaire was verified through calculating the Crookback Alpha coefficient equal to 0/86 following a pilot study. Data was analyzed through SPSS15/Win and results of the explorative factor analysis revealed that five components explained 74/82% of the total variance. These factors were as follows; (1) lesson plan (19.52%), (2) teaching skill (17.97%), (3) communication skills (17.93%), (4) expertise related to lesson content (10.59%), and (5) individual capabilities of members (9.15%) respectively.

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1. Introduction

Higher education represents an investment in human resources and high quality education is important for a country's cultural, social and economic development. In fact, higher education is considered as one of the most important institutions for training a skilled human workforce that leads to a country's economical, social, political and cultural development. So, development of a community can be dependent on the level of its higher education, the qualitative and quantitative development of an educational system (AkhavanKazemi, 2005).

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The quality of a higher education system is related to how it meets its targets and the means by which those targets are met and validated (Pazagadi et al., 2005).

So, attention to the quality of higher education is necessary to maximize the potential of human assets, available materials and financial resources and to coordinate between the development of an educational system and its effectiveness (NavehEbrahim and Karami, 2006). There is currently an increased number of universities in Iran, so some framework is necessary to regulate the quality of the education and services supplied by these institutions. Quality and high standards should be the main priority for every scientific and higher education institution (Sallis, 1997). The perception of quality is complicated and multidimensional (YarMohammadian, 2004) and it is difficult to define in the context of higher education unless there is some agreement on the definition of the term (Cheng, 2003). UNESCO has stated that quality in higher education depends on the environmental status of a university system and its concision or conditions as well as standards related to a specific academic field. Research has determined that quality in higher education cannot be generalized or organized according to a predetermined pattern (Bazargan, 1999) and that teaching quality is highly dependent on its professors and that the capabilities of faculty members are very important.

Research has shown that effective teaching in educational development and student learning were important considerations for evaluations of quality (Bardes and Falcone, 1998; Artiles, 1994). Teaching is a developmental process and includes interactions between a coach and his/her environment (Fuller and Brown, 1975; Steffy et al., 2000). Research has shown that good organization and comprehensive teaching in higher science education better facilitate students' success (Murry, 1987).

Other research concluded that student development in the field of education is influenced by the quality of scientific board members' teaching (Healey, 2000). Those students that experienced high quality teaching demonstrated a deeper level learning. In fact, the duty of teachers is to foster a sense of intrigue and to stimulate learning, high quality teaching encourages students to structure their knowledge and motivates students to learn independently (Trigwell and Prosser, 2004; Lindblom-Ylance and Nevgi, 2003).

Hoover and Arrington (1994) mention that the quality of scientific board member's teaching is influenced by two variables, characteristics of individuals and characteristics of the educational system. Other research found that effective teaching in higher education in agriculture was best facilitated by a teaching style that incorporated three aspects; mental, emotional and physical (Croom, 2003). Another study showed that the provision of good quality is dependent on many factors such as; a culture of high quality, a high value placed on education, good teaching staff that participate in continuous occupational development and the particular academic expertise of professors and leadership development (Lomas, 2004). Simmons (1998) found that interaction among variables such as gender of an instructor, gender of a student, the structure of a lesson, the age of a student, the difference between the average grades and the expected grades of a student in the lesson and the timing of a class all affect the quality of a scientific board member's teaching. Haygood et al. (2004) divided factors effective on an instructor's behavior in classes into two major groups, that of the individual and characteristics of an

educational environment. These groups then established the relations of quality in scientific board members' teaching with variables such as gender, values, numbers of students and the number of years of a professor's teaching experience (Haygood et al., 2004). Oliver (2003) asserts that standards and qualitative indexes in teaching and learning constitute the teaching and learning program itself, the process of a program's development path, the teaching environment, guidance for universities, student satisfaction and valuable quantitative developments. Shayesteh Fard and colleague mentioned the introduction of updates and keeping educational records in their study based on the determination of effective teaching indicators from the perspective of scientific board members and students in the field; other research has also emphasized a positive correlation between a professor's educational record and skills applied to the teaching process (Ghaderi and Dastjerdi, 2003; ShayestehFard, 2003; Salehi et al., 2004). ShabaniVorki (2006) found that lesson design, teaching execution, teaching evaluation and interpersonal relations are the most important indicators determining teaching quality in universities.

Furthermore, there is a basic difference between teaching quality in the current situation and that in an optimum situation. The priorities of effective teaching are teaching method and the power of communication of knowledge employed by a teacher (Asgari and MahjubMoadab, 2010). Teaching method, communication power, knowledge seeking and personal character have been allocated as the most important attributes of effective teaching (Zohur and Eslami, 2002).

Results from the interview regarding potential obstacles to good quality instruction in universities are placed into four categories; unsuitability of strategies and educational programs, lack of employment and assurance of students' future opportunities, the focus on quantity and less attention to the quality of education in evaluations and out of date knowledge of some members of a scientific board (Hoveida and Moulavi, 2008).

Due to the low quality of teaching, development of a comprehensive program to improve the quality of teaching is essential. Unfortunately there is not a comprehensive understanding of the quality of teaching and factors influencing it in the studied region. The basic research question is, what factors are influencing the teaching quality of agricultural education teachers.

The aim of the current study is to investigate the factors that affect the quality of teaching and results of the study can improve teaching quality in higher education courses.

Table 1 Personal traits of agricultural faculty members.

Variable name	Range	Frequency	Percentage
Age	20–30	8	8
	31–40	31	31
	41–50	26	26
	51–60	27	27
	51 and above	8	8
Teaching antecedent	1–5	22	22
	6–10	23	23
	11–15	17	17
	16–20	14	14
	20 and above	24	24

Table 2 Teaching quality index ($N = 63$).

Teaching quality questions	Mean	CV	SD
To use explorative techniques in teaching	6.84	0.302	2.07
To relate a course's subject to the needs of agriculture	6.85	1.168	8.003
To use various evaluation methods	6.93	0.303	2.1
To make a relationship between the contents of taught lessons and a student's interests	6.95	0.276	1.92
To provide a summary of what has been taught at the end of every class	6.96	0.346	2.41
To use executive organizations in compiling contents	6.99	0.317	2.0
Transfer of clarify contents	7.07	0.229	1.62
To have flexibility in the classroom	7.16	0.286	2.05
To match content with practical facilities and laboratory resources	7.18	0.309	2.22
To reflect students' educational progress assessment of results by themselves during the course	7.29	0.325	2.37
To ensure regular class attendance (call roll)	7.32	0.304	2.23
To harmonize a lesson's content with the curriculum	7.33	0.304	2.23
To introduce books, references and papers to the students to aid deeper comprehension	7.35	1.12	8.25
Offer clarification with examples	7.37	0.244	1.80
To encourage students to participate in class activities	7.37	0.259	1.9
Guide to perform	7.55	0.205	1.55
Preparation of class to discussion	7.55	0.225	1.70
Asking of students	7.55	0.238	1.80
To provide up-to-date lessons	7.55	0.350	2.65
Competitive contents in term	7.59	0.237	1.80
To create equal learning opportunities for students	7.60	0.268	2.04
To have a positive attitude toward the students	7.60	0.355	2.7
Punctuality	7.61	0.241	1.84
Appropriate relationships with the learners	7.66	0.248	1.9
To hold practical classes on the farm	7.66	0.339	2.06
Rich study papers in terms of practical aspects	7.73	1.19	9.20
Guidance of students to realization lesson	7.75	0.232	1.80
Esteem moral and social norms	7.83	0.233	1.83
Attention to individual differences	7.83	0.236	1.85
Teaching in different segments	7.83	0.243	1.80
Skill in attention to student's questions and answers	7.84	0.230	1.81
Attention to ICT	7.84	0.242	1.90
Acquaintance with students' morality	7.89	0.231	1.83
Having familiarity with learning psychological principles	7.89	0.256	2.02
Skill in delivery of lesson content	7.92	0.239	1.90
Scientific dominance	7.94	0.214	1.70
Use of lesson plan	7.94	0.219	1.74
To make the theoretical and practical courses harmonized	7.95	0.264	2.1
To ask students to make criticism with others' ideas	7.95	0.291	2.32
Clarity of the lesson's primary aim	7.96	0.213	1.70
To develop students' learning strategies	8.05	0.269	2.17
Easy access to the tutors outside classrooms	8.06	0.248	2.0
To effectively manage the class in the case of a student's failure	8.06	0.311	2.2
Skill use of variable methods in teaching	8.07	0.2007	1.62
Acceptance of criticism	8.12	0.246	2.0
Harmony between character type and teaching career	8.13	0.184	1.50
Arrangement	8.13	0.221	1.80
Awareness of students' needs	8.13	0.233	1.90
To conduct polling among the students by the tutors concerning their teaching methods	8.15	0.266	2.17
Awareness of teaching process	8.19	0.207	1.70
Creation of motivation in students to research	8.20	0.231	1.90
Simple and good pronunciation	8.21	0.207	1.70
Moral characters	8.25	0.218	1.80
Motivational skill	8.25	0.218	1.80
The relationship between taught lessons	8.26	0.254	2.1
Specify lesson content before offering	8.30	0.228	1.90
Appoint of order and discipline in class	8.30	0.244	2.03
To repeat lessons for better comprehension	8.32	1.004	8.36
Implementing arrangement session	8.38	0.242	2.03
Setting teaching materials and observing coherence in presenting lessons, discourse, explaining and transferring lessons	8.42	0.249	2.1
Aplomb and pragmatism	8.46	0.2009	1.70
Jocundity	8.74	0.228	2.00
To make a review on the previous lesson and to express the relationship between the new lesson and previous lessons	9.32	0.385	8.25

2. Methodology of the study

This study is a functional research in view of a specific goal; it is a non-experimental view of a set of variables that determine a control for higher education. The statistical set was taken from members of the scientific board of Agriculture and Natural Resources, Tehran University (Karaj and Abureihan campus) ($N = 256$). The sample set assigned 83 people using a pre-trial questionnaire by 30 people from the scientific board of Agriculture and Natural Resources campuses and based on the Kokaran formula and was increased to 100 people to increase the accuracy and generalization of results and the statistical sample of the present study was selected by the random sampling method. The basic tool for the study was a questionnaire that was used to collect information. The identified variables were listed after reviewing library resources; internet resources and interviews with professors in the field. Respondents were asked to evaluate their importance and to give a score between 0 and 5.

Admission of the study tool was assigned using the opinions of some professors after the necessary amendments.

The Kronbach Alpha method was used to determine permanency of the study tool. Kronbach Alpha coefficient was equal to 0.86 for the scale used in the study, which indicated acceptable permanency and so the questionnaire contents were validated and provided to the respondents. The factorial analysis method was used as the multi-variable method after completion of the questionnaire and data collection and their entry onto SPSS software.

3. Results and discussion

The average of professors' ages was 45 years. The standard deviation of respondents' ages was 10.4, which indicates high distribution of age in the subjects. The age range of the professors in the study was between 69 and 26. According to these results, 9% respondents were females and 91% were males. The greatest frequency related to the age group 31–40 years. The youngest and oldest were 26 and 69 year old respectively. The results are presented in Table 1.

The average teaching record of respondents was 14 years and the majority of respondents had the master-assistant scientist grade in view of scientific grade.

The effective variables on teaching quality were examined from the respondent's perspective and results are presented in Table 2.

On the basis of data mentioned in Table 2, the most important variables affecting teaching quality were respectively the coordination of personality type with teaching occupation, 8.13, the standard deviation, 1.5, the skill of using the methods

and different techniques in the learning process, 8.07 and standard deviation, 1.62 and self-confidence and decisiveness, 8.46, standard deviation of leadership, 1.55, understanding the learning process, 8.19, and standard deviation, 1.7, in view of scientific board members.

3.1. Comparison of teaching quality of the members of faculty with different scientific ranking

Teaching quality of faculty members with different scientific ranking was compared and a meaningful difference at 5% was found. Based on results of comparison of means, the mean of teaching quality at scientific ranking of the tutor was higher than the mean obtained in two other scientific rankings. The results are presented in Table 3.

KMO coefficient and Bartlett trial were used to determine the suitability of collected data (the factors effective on teaching quality) in order to conduct a factorial analysis.

The level of MSA (which is stated as KMO in the computer) in this study was equal to 0.722 and indicated that the data situation was "good" for factorial analysis (Table 4).

The Bartlett statistic level was equal to 4848/174, which was a level of 1%. So, they were suitable to analyze factors in total data in Table 5, the number of extracted compilations and their specific levels, variance percentages and accumulation percentages of compilation variances were indicated. The specific level indicated the share of every compilation from the total variables' variance and it was determined that the greater the level, the greater the effect of its compilation. The first compilation had the greatest share (19.15%) and the fifth compilation had the least share (9/15%) in specification of variables' variance and in total the five mentioned compilations

Table 4 KMO and Bartlett's test and sig.

KMO*	Bartlett's test of sphericity	Significant
0.722	4846.174	0.01

* Kaiser–Meyer–Olkin measure of sampling adequacy.

Table 5 Eigen value and Pct of Var and Cum Pct.

Factors	Eigen value	Pct of Var	Cum Pct
1	6.512	19.152	19.152
2	6.112	17.976	37.128
3	6.099	17.939	55.067
4	3.604	10.599	65.666
5	3.113	9.155	74.821

Table 3 Comparison of teaching quality of the members of faculty with different scientific ranking.

Variable	Scientific ranking	Frequency	Mean	χ^2	P
Teaching quality	Assistant Professor	40	43.31	4.828*	.089
	Associate Professor	39	52.94		
	Professor (Tutor)	21	59.67		
	Total	100	–		

* Meaningful at level of 5%.

could estimate 14/82% of variables' variance, which indicated a higher percentage of specified variance by these compilations.

The Varima method was used in the present study to turn the factors. The variables related to every compilation were determined as a column. The results of factor turns are demonstrated in Table 6.

To name the compilations, the nature of variables in every compilation and the most important present variables in every compilation were mentioned. Table 5 provides the factors and

variables related to factors along with factorial loads and their concealed buoy.

The first extracted compilation was named as the factor of a lesson design according to the concept of its variable. This factor included the determination of lesson content before its introduction, the specification of goals and heads and references at the beginning of a mid-term period, the regulation of lesson materials and observation of the order in the introduction of materials, the explanation method, the understanding and lesson materials transfer, to offer the summary of

Table 6 The variables related to compilation, the level of factorial load obtained from the turned matrix.

Compilation	Variables	Factorial load
Lesson design	To determine the lesson before teaching	0.822
	To specify the goals and heads and the references at the beginning of a mid-term	0.933
	To regulate the lesson material and observe a teaching order, in the materials teaching, speech method, understand and transfer the lesson materials	0.927
	To introduce the summary of lesson materials at the end of class	0.951
	To use different methods of evaluation	0.917
	To review the previous lesson and mention the relation of New lesson with the previous lesson	0.952
	The proportion of lesson contents to the heads and homeworks	0.906
The teaching skills	To teach in different education levels	0.944
	To use exploratory methods in teaching	0.940
	To reflect the results of students' education development evaluation to them	0.937
	To introduce the principles of learning psychology	0.911
	To encourage the students for participation in the class activities	0.923
	To use the lesson design and to design the instruction program	0.733
	To observe the order in the class	0.696
Communication skills	To communicate with the learner	0.895
	To easy access to the professor out of the class	9.510
	To motivate the student to study and investigate	0.968
	To create a chance to learn in the learners	0.957
	The skill in attention and listening to the questions and answers of students	0.897
To guide the students for doing the lesson activities	0.898	
The expertise skill in the lesson content	To introduce update content	0.977
	The relation of lesson subjects with the agricultural community needs	0.892
	To enrich the contents from scientific dimension	0.689
	The proportion of theoretical and practical lessons	0.981
Individual and occupational	The scientific domination in the lesson subject	0.979
	To observe the social and ethical norms	0.975
	The apparent arrangement	0.948

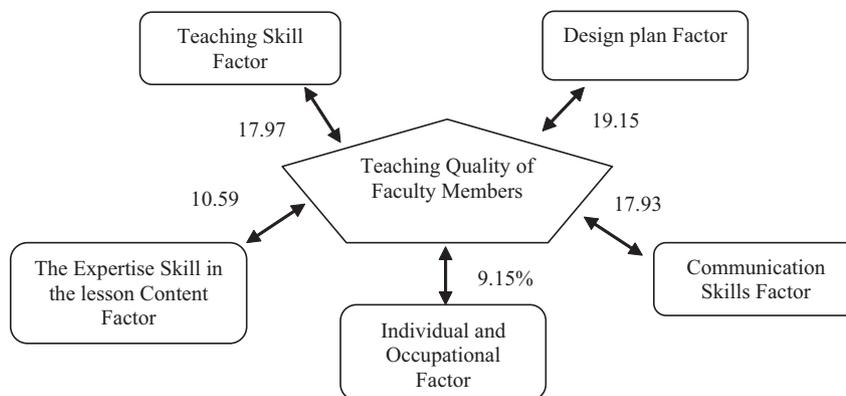


Figure 1 Model of factors related to the teaching quality of faculty members in an Agricultural college in Iran.

lesson materials at the end of class, using different methods of evaluation, the review of previous lesson and stating the relation of new lessons with the previous material and proportion of lesson contents to homework.

The second extracted compilation indicates the collection of variables related to teaching skills. Good teaching skills require teaching at different levels of education, using exploratory methods in teaching, good evaluation of results of students' educational development to them, skill in using methods and different techniques in the learning-teaching process, introduction to the principles of learning psychology, the encouragement of student participation in class activities, using the lesson design and design of instructional program and establishment of order in the class. The third compilation indicates the necessity of communication skills of members of the scientific board. The findings indicated that communication skills include interaction of the learner, easy access to the professor out of class, student motivation to study and research, introduction to the students' mentalities, creation of equal learning opportunities among students, attention to students in terms of listening to their questions and providing suitable guidance. The fourth compilation was named as the expertise skill in the lesson content and includes the necessity for up to date course contents, the relation of lesson subjects to the agriculture community's needs, to enrich the contents from the scientific dimension and proportion of theoretical and practical lessons. The fifth compilation is the scientific aspect of the lesson, to observe the social and moral norms and apparent arrangement. The results are shown in Fig. 1.

4. Conclusion

This study was done to determine and classify factors related to teaching quality of board members in higher education science. The results of the factorial analysis indicated that five compilations specified 74/82% variance. This provided evidence that effective teaching requires a suitable combination of these factors in time and space. The most important compilation is a lesson plan and most studies indicate the importance of design in developing quality. The teaching skill compilation, specifying 18% variance and validating previous studies, indicated that teaching skill is a determinant factor in Iranian conditions in terms of members of the science board. The compilation of professors' communication and their ability to communicate well with students and their ability to offer moral guidance are all key aspects that affect the provision of good teaching quality in higher education. This compilation in the present study indicated that the existence of communication skills in the scientific board members has an influence on teaching quality, specifying 11% variance, and the effects of variables such as up to date course material and enriched lesson content on the quality of education are undeniable. If all these aforementioned cases were provided but the personal and moral attitude is not well observed then the teaching quality will be decreased specifying 9% variance by this compilation. Members of the scientific board indicated that it is very important to increase the teaching quality of board members in agriculture to enrich the human asset it will provide, as well as to use material and financial resources. It was also recognized that the coordination between the development of instructional systems and their efficacies, should be exploited

by paying more attention to the complementary education periods in universities because most members of future science boards are trained in these centers and their abilities and interest levels are formed in this environment. Enabling individuals in a scientific environment depends on the strength of the board's scientific dimension in order that the expected goals of higher education in agriculture be obtained by instruction-oriented management.

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