



The Design of a Model for Teaching Human Science in the Third Millennium Considering the Change in Teaching Methods in the Late Century (1910-2010)

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ABSTRACT

The current research is done to design a model for teaching human science in the third millennium considering the change in teaching methods in the late century. The main problem of the current research is answering the question: "How we can design a good model for teaching human science by blending the strong points of teaching methods in the late century. The research is library research and is done in 2010 in Iran. The statistical population includes all teaching methods made by all experts and thinkers in human sciences and the statistical sample is also including the best teaching methods. In this research inference statistical test (factor analysis) is used by SPSS software. The results of the research indicate that the best model of human sciences lessons is including 5 factors and 31 minor components and its proportionality degree from human science experts is approved as 89.30.

KEY WORDS: Teaching method; model design; major and minor factors; human science.

INTRODUCTION

The teaching methods by educational experts and teachers are very varied. International office of education affiliated to UNESCO mentions more than 300 teaching methods. The variety of teaching methods encourages educational experts to classify the existing methods and models.

As the teaching methods are used in schools and universities, by considering the importance of being compatible with modern technology, this research attempts to analyze the change process of the most important teaching methods applied in the past 100 years and also by combining the strong points and weak points of these methods and considering the new methods being used in most of the developed countries by teachers, we can design a good teaching model for educational lessons.

Statement of the problem

The educational programs used for the personal growth of learners should be incentive and develop the positive interest. Learning environment should provide more activities for learner. During the education program, learners are expected to obtain their required knowledge from their personal study and find an opportunity in their education course to test their knowledge. (Siller, Torvald and Ball (1996). on the other hand, learners do not learn anything by just sitting in the class, listening to the teacher, memorizing homework and answering to the questions. They should learn to discuss about the lesson and its related issues and write about it and related it to the previous experiences and use it in their daily life. They should remember all the things they learn and use it in their life Checkering (1987). Therefore, it seems that today, traditional teaching methods are not very efficient as before and they are being forgotten. However these methods have both strong points and weak points and by modern teaching methods are considerably developed and recommended. Therefore, the current research attempts by analysis of the change trend in teaching methods in the late century and analyzing weak points and strong points of each methods and considering the limitations and opportunities in these method present a teaching method for teaching educational textbooks by combining the strong points of these teaching methods and considering the current condition and moving toward the good condition.

Significance of the problem

The teaching methods and models presented by teachers and educational experts are very varied and are in a continuous change. As combining them is very difficult and there is not a consensus between experts on each of the methods. Due to this fact, the research attempts to analyze and classify the best teaching methods in the past 100

years and draws a picture of the methods change trend in the previous century in education and learning in order that teachers could select the best method in terms of the condition and facilities and also the best learning environment. Also, this research reminds us that to update our knowledge about teaching and improving learning quality, it is necessary that teachers and lecturers become familiar with modern methods and change their teaching methods. The results of this research can make teachers familiar with the necessity of creating changes in teaching methods and also provide them with a model by which they can create deep and effective learning and change the existing methods by combinational new teaching methods.

Teaching new models

The models proposed in this section are teaching and learning models divided into four classification of social models, information processing models and behavior systems models, that models of each group and its creators are shown in tables 1 to 4 (Joyce, Will, Calhoun, 1998) and the difference between student –based learning and traditional teaching is indicated in table 5. (Newbelle, 2006)

Table 1- Social models

Models	Creators (investigators)
Peers in learning	David Johnson, Roger Johnson
Positive interdependence	Margarita Calderon, Elizabeth Cohen
Structured Inquiry	Aronson, Robert Slavin
Group investigation	Herbert thelen, John Dew
Role playing	Fannie Shaftel
Jurisprudential	David Oliver, James shawer

Table 2- individual models

Models	Creators (investigators)
Nondirective Teaching	Carl Rogers
Enhancement of Self-esteem	Abraham Maslow, Bruce Juice

Table 3- Information processing models

Models	Creators (investigators)
Inductive Thinking	Hilda Taba (Bruce Joyce)
concept attainment	Jerome S, Bruner, Fred Lighthall Tennyson · Cocchiarella, Bruce Joyce
Mnemonics (aiding memory)	Michael Presley, Joel Levin, and Richard Anderson
Advance organizer	David Ausubel, Lawton & Wanska
Scientific discovery	Josef
Inquiry training	Richard suchman, (Howard Jones)
Synecities	Bill Cordon

Table 4- Behavior models

Models	Creators (investigators)
Mastery learning	Benjamin Blum, James Block
Direction instruction	Good, Jerry Brophy, Wes Becker, Carl Bereiter
Simulation	Carl Smith, Marie Smith
Social learning	Bandura ,Carl Thoresen , Wes Becker
Planned instruction	B.F. Skinner

Main factors about teaching methods

- 1- Just on method is not the best method
- 2- None of the lessons are not taught by one teaching method
- 3- The term mixed method doesn't indicates any certain method
- 4- The most important role of the teacher is guidance
- 5- The result and advantage of lessons is more than the lessons themselves
- 6- The results of the lessons are important than the lessons itself.

Virtual education

Virtual reality is called software production of an imagination or environment that is equal to reality for senses (more visual) and 3 D space created by computer is the same. In fact, virtual reality is using advanced technology including computer and its additional equipment and different multi instruments to create an environment (simulated). In this environment, user gets objects, virtual events comparable with real world by

designed models and especial sensors as interactional and observes moving pictures as a person thinks he/she is located in the real environment.

Table 5- The difference between student-based learning and traditional teaching (Kennan, Newbelle 2006)

Student-centered learning	Traditional teaching
The students have an active role in designing their leaning, interaction with teachers, students, research and responsibility assessment	The students are often passive. They sit in the class and don't have any role in learning design.
The students can select the leaning method and the content of the lessons	Most of the decisions are made by teacher
The emphasize is on interactive learning in curriculum.	The emphasize is only on learning the subject
The emphasize is on the research activities	The emphasize is on receiving information
Teacher is as the guider, director and facilitator	Emphasize on external motivation and marks
Emphasize on internal motivation (interest, curiosity, responsibility)	Learning is restricted to fixed teaching locations (auditorium, libraries, labs and etc.)
The focus is on cooperative learning	Teacher is as the distributor of knowledge and activity controller.
Learning may occur every where	Learning is as individual and completion between students.
There is more flexibility in teaching and learning	The planned discipline is rather inflexible
There is more flexibility in assessment directing toward common self-assessment and peer-assessment	Assessment with more emphasize on test, is considered the responsibility of teacher
Long-term prospective and permanent learning is emphasized.	Short-term prospective and doing homework and learning for test is emphasized

Education technology definition

Education technology board of engineers national academy define education technology as the followings:<< It is a scientific set of the application of teaching and learning science in the real world of the class with instruments and methods developed to help these applications.>> (Dieuzeide, 1971)

In another definition, technology is defined as all the methods and tactics used in the application of educational principles. (Cleary, 1976)

Education technology of systems application is the techniques and additional equipments to improve human being learning process. Education technology is defined by four features: The definition of the goals the students should achieve is the application of learning principles in the analysis of the studied object of the students, selection and using good medias to teach lessons, and using efficiency of lessons. (Collier, 1971)

Silverman has proposed two concepts of education technology:

- 1- Education technology is a ration that emphasize both on methods and instruments.
- 2- Education technology is a structure emphasizing educational analysis, the production and selection of assessment instruments and production facilities in terms of educational desired output. (Silverman, 1968)

Evolution of information technology and communication

The most important use of technology in future is the increase of the production of meaningful works of students. They write, make it picture and publish it. Lately, a research titled” the effects of using technology in education from kindergarten to grade 12”is done from American Institute and based on its results due to using information technology in most of the schools, there will be a change and the following inclinations are occurred or they are going to be formed. (Birmab, 1997)

- 1- The private sector plays more roles in schools and accelerates the suggestion of technology in schools.
- 2- Computer multimedia had increasing development as the instrument of students for creating science.
- 3- Optical technology is an ideal resource for maintaining materials and is accessible vial networks. The reason is the cheap price, durability and rapid access to materials in optical technology such as optical Disc or CD-ROM or its substitutions as DVD.
- 4- Libraries will become as automatic information centers. Public libraries and school libraries, reading, watching, hearing and recreational instruments and besides, electronic reference services will be distributed in an extensive level by encyclopedias and data bases stored in compact discs and networks available even from home.
- 5- Tele-communication is the main factor in giving information to schools and home and this thing increases home schooling opportunities and at the same time change the nature and feature of the class.

Review of local and international researches

Marit Hegg Reime, Anette Harris, June Aksnes, Jane Mikkelsen (2008) in a research as the most successful teaching method for nursing students for pollution control teaching applied two methods as one internet learning and the other lecture method and concluded that the students were convinced by both education approaches and internet learning should be used as a resource in lecture method.

George Belliveau (2007) in the analysis of a practical model substituted by education and learning, on 12 student teachers showed that how in a practical practice based on performance with grade-six students participated on one of the urban areas and developed their serious performance called as "You didn't do anything" and gave it to 40 primary schools in Princess Edward island. This investigator already worked on performance as one of learning methods in curriculum namely as a way to create student-based environment, positive community and meaningful social justice and based on the collected comments from students and teacher students concluded that learning based on performance and art activities and had a positive effect on students learning and its presented an effective and sensitive ways to deal with social justice in the class.

The students who learn fewer things academically, mostly in the performance are appeared as the leader of the group that this thing improves their self-confidence and motivation.

Chinwe Nwagbo (2006) in an article analyzed effectiveness and the effect of two education methods on availability and inclination to biology of different scientific knowledge of students. A design of control group equipped with pre-test and post-test was considered for study, 147 students of the second four semesters were selected randomly from eight separate classes from 4 N sukka college, E nugu, Nigerie. The results of this research was that directed research method was significantly better than descriptive method in the increase of cognitive biological access of all the students namely, in high levels.

The students of different scientific levels had positive inclination to Biology, when two methods were used, the concepts and applications and educational contents of the results were more obvious in Biology teachers.

Magid son (2005) in a research titled "building bridges in mathematics, education, research and educational design" believed that in mathematics teaching, education researches and education designers play common goals to improve mathematics teaching and learning. In this research, he tried to make relationship between education, research and education design in mathematics. To do this the work location was transferred from university education base to teacher class. At first, these three areas, research, design and education were separated from each other to study their reactions on each other. The result was that interactions and reactions these three areas have on each other can be constructive and lead into the discovery of new concepts and strategies in teaching mathematics and also in this study a good field for cooperation of teachers, researchers and designers was provided.

John Pearson (2004) in an article titled the investigation of ICT and learning based on problem basis on online learning environment and face to face environment, they concluded that PBL is a periodical approach to examine ICT of learning environment pyramid both as online and face to face create a new knowledge about the challenges of accepting new technologies in an environment different from education.

Rupert Wegerif (2004) in a research "the role of educational software and computer in learning and teaching" analyzed on 119 students at age 9-10 and they came to the conclusion that teaching the students by computer can provide considerable learning benefits to be applied by a normal program.

Conole, et al (2004) in a research titled as "the compatibility of education and instruments for the design of effective learning" proposed that managers should support internet learning approach development and in this research, some models were proposed to present theoretical approaches and supporting learners. In this research a relationship was made between learning theoretical approaches and using especial instruments and resources for learning. The result was that this relationship caused the compatibility of different educational process and instruments and lead into a more flexible and compatible learning approach with the theoretical aspect of learning of learners. Angeli (2004) in his research titled "changing a course of teaching method via technology and its effect on pre-service teacher technology qualification" applied an educational design model to renovate a period of teacher teaching method by technology. This proposed model was used in a scientific teaching method in 2 semesters continuously by the registration of 111 students in fall terms and 116 students in spring by some instruments as multimedia in fall term and modeling software in spring term.

Instructors of teachers, designed a high quality technology-based curriculum and modeled them for teachers and lecturers in the class. Also, an instrument was built for assessment of teachers technological qualification and assessment was done from 4 aspects. The results showed that pre-service teachers in the modeled group had better performance in comparison with pre-service teachers in multimedia group. Indeed, the modeled group had better performance than multimedia group.

Rees, Sheard, Mcpherson (2003) in a research titled "perspectives and experiences of medicine students about the learning methods and educational communicative skills" studied with the goal of exploration and examination of the perspectives of medicine students by empirical educational methods and its connection with leaning skills in 5 concentrated groups with 32 students in concentrated group every 5 years to get the medicine degree in Nottingham university and concluded that students prefer empirical teaching methods of learning group skills and also methods as role play to other teaching methods. Ken Beatty, David Nunan (2003) in an article titled "group leaning by computer stated that according to the investigation on 10 groups of students, and on the basis of

the data analyzed as quality and quantity, concluded that these studies couldn't prove this hypothesis to create a more constructive interaction among students.

Meichun Lydiawen, Chin-Chung Tsia, Hung-Minglin, Shih-Chyuehchuang (2003) in a research investigated non-technical and super cognitive and cognitive-technical , content of constructive learning environments aspects based on internet and by LisREL analysis and by study or environmental research tested constructive internet learning (CI LES) in which CI LES is including 6 scales and of 2 classified aspects, the first one is super cognitive including negotiations of students, research learning and reflective thinking and the second one is including technical and content aspects considering some scales of communication, relating, easy use and challenges. In order to test the communication between student's reactions some researches were done from two aspects from 483 schools (high school) in Taiwan and they were research data of this study. The results were that for assessment of student's preferences for constructive internet learning environments besides structural model showed that constructive internet learning challenge the existing concepts of the students and analyze them. For student negotiation, research leaning and reflective thinking activities were proposed in which internet can have a strong relationship with different resources and approaches to create new leaning environments to provide different kinds of discussion and challenges for learners.

Somaye Jahandideh (2009) in a research titled "The analysis of changed trend in teaching methods in the past 50 years presented an optimal teaching model in educational science lessons.

Sheikh Mohseni (2007) in a research titled " The investigation of the effect of teaching new models on academic progress of intelligent students and its comparison with lecture method in chemistry, biology, literature and economics concluded that the group being taught with new teaching models had more progress in comparison with the group being taught by lecture method.

Nematollah Musapour (1997) in a research titled " the design of a model for assessment of curriculum and using it in the assessment of methods and teaching techniques of universities teacher education found that good qualification is not seen in teachers or it is not at least appeared. However, teachers do according to what they have learned. In other words, there is a big difference between good program and executed program. Therefore, it is suggested to modify the curriculum and teaching methods to make the execution more close to what was expected. The researched show that different studies and investigations are done in efficiency of some of educational methods by education researchers and the result of these investigations is considered by education experts to improve teaching methods. This result shows the good points of some of these methods in comparison with other methods. The special feature of this research in comparison with the others is that the previous researches compared the effect of one method in comparisons with the other methods in a certain lesson (eg; science) and none of them presented any teaching model in the country. But the current research by the investigation of the previous teaching methods change trend tries to provide an optimal model for educational science lessons.

Research questions

- 1- What kind of teaching methods for human science are providing in the past 100 years?
- 2- How we can blend the strong points of teaching methods to design a teaching model?
- 3- How much is the given model approved by lecturers and experts of human science?

Research purpose

- 1- Analysis of teaching methods change trend in the past 100 years
- 2- Determination of limitations and opportunities of teaching methods to design a teaching model
- 3- The design of the final model by major and minor components and determination of proportionality degree by human science experts

RESEARCH METHOD

In this research library method is used for gathering data from the library resources, and for scientific articles, world wide web is used.

Research population and sample

The studied population in this research is all the teaching methods presented by education expects and the studied sample is including the best teaching methods used for learning and teaching in the past 100 years.

Data gathering instruments

In this research, books, articles, magazines, database, computer networks, films and the best teaching model festival are used.

Statistical analysis method

Factor analysis is used for the analysis of the collected data, Statistical methods (inference) in Spss environment is used for the determination of the structure of the data and the final model of human science is designed.

RESEARCH RESULTS

First question: Which methods are proposed in the past 100 years?

Table 6 shows the classification of different teaching methods and table 7 indicates the teaching methods used in the past 100 years.

Table 6- The classification of teaching methods

Method	The name of methods	Year
Traditional and common teaching methods	Grammar translation method lecture method, question and answer method, performance method, role playing method, field trip , group discussion method, pilot method	Decade 1910 1950 1970 1980
New teaching methods	Individual teaching methods, mastery learning, private teaching, program education, teaching by computer, directed individual education, units method, discovery method, Cooperative method, Synectics method	Decade 1960 1970 1980 1990
Teaching models	Advance organizer model, problem solving model, inductive thinking model, concept attainment model, scientific inquiry model Investigation group model indirect teaching model, mastery learning model , direct teaching model	Decade 1960 1970 1980 1990

Table 7: The change trend of teaching methods

Year	Teaching methods in the past 100 years
First decade: 1920 and before it	Traditional system Socratic teaching method Expository teaching method Grammar translation method Lecture method
Second decade: 1920-1950	Grammar translation method Lecture method Question and answer method Performance method Role playing method
Third decade: 1950-1960	Lecture teaching method Question and answer method Performance method Field trip method Group discussion method Pilot method
Fourth decade : 1960-1970	Lecture method Question and answer method Performance method Role playing method Field trip method Group discussion Private teaching Program teaching Computer-based teaching Units method
Fifth decade: 1970 and after that	Lecture method Role playing method Question and answer method Performance method Field trip method Group discussion method discovery method Cooperative method Computer-based teaching Units method Program teaching Synectics method Pre advance-organizer model Problem solving model Concept attainment model Investigation group model

Second question: how we can blend strong points of teaching methods for design of a teaching method model? Considering the benefits and limitations of different teaching methods lead into a deep recognition of the existing condition and it is as a communication channel to achieve the good condition. If the teacher in selection of effective

teaching method, be familiar with strong points and weak points of different methods, by considering conditions, learning environment and content can innovatively use the combination of all methods to have the most benefits and the least limitation for deep and effective learning in students. And as most of the teaching subjects in both teacher-centered and student –centered methods is dedicated to four sections: communication, communication continuity, effective communication and the end of communication. Table 8 shows the classification of teaching methods benefits in each of the 4 sections.

Table 8: The features of teacher-based and student –based

Student – centered features	Teacher –centered features
1- the expectation of attention from students 2- Friendship with students 3- raising motivating question or questions before class 4- Agreement with students on behavior discipline in class 5-Encourage students about the behavior in class	1- trying to attract the attention of students 2-Maintaining the position of student in students view 3-Talking about goals before the class 4-Determining the conditions of behavior in the class 5-Inviting students to learning without any preparation 6-Stimulating students to learning and competition in learning 7-Being serious 8-Being formal (Observing definite regulations and pre- planned
6- encouraging students for collaborative learning 7- Sense of humor	9-Emphasise on teacher based teaching
8- flexibility toward students needs	
9- Emphasize on the activity of students (including mental, physical and et. Activities)	10- Trying to explain the lessons
10- Trying to raise question and doubt among students 11- encouraging students to discovery and tolerating their incorrect answers. 12- stimulating students to interaction and activity 13-Tolerating and encouraging slow-learning students 14- Paying attention to the subjects students are interested in and unpredicted situations. 15- Action based on the requirement of learners for having time for learning 16- respecting the learning process 17- trying to be innovative 18- Using strategies that improve internal motivation. 19- considering research in the class for problem solving	11-Emphasise on getting a correct question from students 12-Keep order in the class 13-Emphasise on students receiving the lessons 14-Activity in the form of a pre-planned lesson 15- working in the form of a pre-planned program 16-Emphasising the content of the lessons 17- Emphasize on the proved things 18- Using external rewards for easy learning 19- Using professional knowledge for problem solving 20- Re-explanation of the lesson by teacher
20- Asking the lessons from students	21- Exclusive attention to the lessons according to the pre-planned lesson 22- Teacher-centered behavior and decision making by teacher about the affairs
21- Considering the needs and interest of learners and changing the curriculum	23- Immediate response to teachers questions
22- Student –centered behavior (collaborative decision making of students)	24- Giving examples and illustrations for the subject of the lesson
23- Acceptance and encouraging question	25-Making students to be just dependent upon the book
24- Trying to use students experiences 25- The introduction and encouraging to use different resources. 26- Searching additional information from different resources 27- Trying to teach the structure of the lessons 28- Encouraging curious students to curiosity 29- Trying to tell the students that you don't know all the answers for questions 30- Dedicating a part of questions to the things students don't have any information 31- Accepting uncommon questions 32- Emphasize on new processes 33- Asking such questions that force students to use new learning things 34- Data gathering to direct student for better learning 35- Emphasize on student activities 36- Emphasize on renovating lesson in assessment and education process 37- Giving importance to reasons students provide 38- Determining duties that give revision opportunity for student 39- Considering the thinking method, reasoning and reply content	26-Using the defined lessons in the text book 27- Trying to say the structure of the lesson 28- Trying to control the curious students 29- Trying to give convincing answer to questions. 30- asking the things students should know 31- Accepting the common questions 32- Having some standards for students answers 33- Ask question of the lessons 34- Data gathering to assess the students performance 35- Emphasize on the results of the activities 36- Emphasize on remembering the lessons in assessment and teaching 37- Giving importance to references students provide 38- Determination of duties that obliged students to obey the orders 39- Just expecting correct answers and avoiding wrong answers

Table 9- Variance of 5 main components

Specific value	Sum	Variance (%)	Compression (%)
General parameters			
Preparation	15.418	49.736	49.736
Education running	3.557	11.473	61.209
Education discussion	2.292	7.395	68.603
Evaluation	1.724	5.561	74.164
Correction act	1.410	4.548	78.712

As the studied teaching methods are content-based, teacher-centered and student-centered are analyzed from communication method, communication continuity, effective communication and the end of communication, in some of the teachers is acting as principle and in some others the teacher is counselor. Here spiral model is used based on evolutionary development and it shows based on a cyclic approach, the teacher-centered teaching methods, content-based and student –centered developing methods.

Table 10- Loading factors of minor components

Major factors	Minor factors	Factor loading
First factor Preparation	Examination of time, place and content limitations	0.676
	Explaining unknowns	0.756
	Selection of content and correct work method	0.835
	Considering good solutions	0.817
	Proposing good teaching methods	0.742
	Budget, determination of teacher, student duties, education technology	0.705
	Pilot teaching g	0.776
	Structure, preparation and coordination	0.799
	Leadership, motivation, capability, supervision, guidance	0.935
	Pre-test	0.897
	Analysis	0.651
Second factor Teaching	Planning	0.689
	Plan lessons and presentation	0.853
	The change trend and the communication way of teaching methods	0.901
	Education technology (considering the science global growth)	0.869
	Communication with effective learning factors	0.795
	Science –based teaching methods	0.754
	Content –based teaching methods	0.614
Third factor Teaching analysis	Condition analysis	0.792
	Design	0.913
	Analysis of environmental factors including internal and external	0.716
	Determining goals and values	0.780
	Fourth factor Assessment	The investigation of the created limitations
	Formative assessment	0.816
	Need assessment	0.841
	Additional assessment	0.785
	Using student-centered teaching methods	0.760
	Fifth factor Corrective action	Assessment
	Determination of strong points and weak points	0.860
	Determination of opportunities and threats	0.836
	Determination of resources and time limit	0.727

Table 11- Factor Analysis

	Initial	Extraction
Q1_1	1.000	0.792
Q1_2	1.000	0.689
Q1_3	1.000	0.727
Q1_4	1.000	0.913
Q1_5	1.000	0.853
Q1_6	1.000	0.734
Q1_7	1.000	0.901
Q2_1	1.000	0.766
Q2_2	1.000	0.869
Q2_3	1.000	0.795
Q3_1	1.000	0.780
Q3_2	1.000	0.860
Q3_3	1.000	0.836
Q3_4	1.000	0.727
Q4_1	1.000	0.676
Q4_2	1.000	0.756
Q5_1	1.000	0.835
Q5_2	1.000	0.817
Q5_3	1.000	0.742
Q5_4	1.000	0.705
Q6_1	1.000	0.776
Q6_2	1.000	0.799
Q6_3	1.000	0.935
Q7_1	1.000	0.897
Q7_2	1.000	0.816
Q7_3	1.000	0.841
Q7_4	1.000	0.785
Q7_5	1.000	0.651
Q8_1	1.000	0.754
Q8_2	1.000	0.614
Q8_3	1.000	0.760

The spiral model is divided from activity aspects called working area. This model is including 6 main stages of important point, starting (analysis of condition), planning, the investigation of limitations of design, curriculum.

This model also shows the way to change teaching methods and the relationship between these methods and each of the components has some minor components.

Considering the results of the data analysis 6 main factors of human science model are named as main components. The extracted variance of each 5 main components is shown in table 9.

Corrective action, assessment, teaching analysis, preparation, density percent

In order to give more information, we can refer to the minor components of each main component. The minor components with the order of factor loading are shown in table 10.

As it is shown in table 12, each of 31 components are classified as one of 5 factors and again for Q component, in each row, the highest number is selected and that variable is considered as that factor.

Third question: How is the Proportionality degree of the model is approved by human science experts?

To design this model, at first the experience of experts was studied and the theoretical basics about the different teaching methods were analyzed and finally the major and minor components were obtained regarding the research background and theoretical basics in the world. The designed model was prepared to receive comments from experts to measure the proportionality degree.

The proportionality degree of the model in the main components showed that the proposed model is 89.30% approved by human science experts and teachers.

Table 12- Rotated component Matrix

Factors Components	F1	F2	F3	F4	F5
From	Q4-1	Q1-2	Q1-1	Q1-3	Q1-6
Q1-1	Q4-2	Q1-5Q	Q1-4	Q7-2	Q3-2
to	Q5-1	Q1-7	Q2-1	Q7-3	Q3-3
Q8-3	Q5-2	Q2-2	Q3-1	Q7-4	Q3-4
	Q5-3	Q2-3		Q8-3	
	Q5-4	Q8-1			
	Q6-1	Q8-2			
	Q6-2				
	Q6-3				
	Q7-1				
	Q7-5				

Table 13- Rotated Component Matrix

	Component				
	1	2	3	4	5
Q1_1	.123	.321	.763	.201	.226
Q1_2	.369	.425	.411	.339	.298
Q1_3	-.004	.396	.277	.612	.345
Q1_4	.018	.385	.823	.228	.186
Q1_5	.234	.805	.027	.272	.275
Q1_6	-.028	.469	.417	.265	.519
Q1_7	.354	.786	.361	.166	-.016
Q2_1	.504	.333	.592	-.022	.224
Q2_2	.372	.570	.370	-.121	.504
Q2_3	.443	.608	.234	-.072	.411
Q3_1	.049	.050	.733	.311	.376
Q3_2	.299	.239	.393	.290	.689
Q3_3	.225	.223	.225	.137	.817
Q3_4	.478	.186	.291	.290	.544
Q4_1	.725	.185	.293	-.147	.095
Q4_2	.697	.390	.303	.117	-.113
Q5_1	.819	.039	-.007	.372	.154
Q5_2	.733	.279	-.041	.241	.378
Q5_3	.577	.058	.135	.538	.312
Q5_4	.604	.015	.572	.099	.052
Q6_1	.796	.231	-.210	.183	.113
Q6_2	.768	.277	.261	-.200	.156
Q6_3	.713	-.105	.220	.327	.511
Q7_1	.892	-.008	.000	.314	.051
Q7_2	.404	.154	.246	.741	-.141
Q7_3	.446	.219	.228	.645	.354
Q7_4	.400	.116	.264	.733	.061
Q7_5	.684	.150	.240	.239	.213
Q8_1	.359	.685	.270	.257	.128
Q8_2	-.065	.741	.120	.197	.090
Q8_3	-.082	.342	.014	.731	.318

Extraction Method: Principal Component Analysis.
 Rotation Method: Varimax with Kaiser Normalization.
 a. Rotation converged in 19 iterations.

Table 14- Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	15.418	49.736	49.736	15.418	49.736	49.736	7.866	25.374	25.374
2	3.557	11.473	61.209	3.557	11.473	61.209	4.675	15.079	40.454
3	2.292	7.395	68.603	2.292	7.395	68.603	4.192	13.523	53.976
4	1.724	5.561	74.164	1.724	5.561	74.164	4.067	13.119	67.095
5	1.410	4.548	78.712	1.410	4.548	78.712	3.601	11.616	78.712
6	1.275	4.112	82.824						
7	1.117	3.602	86.426						
8	.869	2.803	89.229						
9	.694	2.240	91.469						
10	.548	1.769	93.238						
11	.474	1.530	94.767						
12	.383	1.236	96.004						
13	.347	1.119	97.123						
14	.261	.840	97.963						
15	.237	.765	98.729						
16	.139	.448	99.177						
17	.076	.246	99.423						
18	.069	.223	99.646						
19	.041	.133	99.779						
20	.037	.118	99.897						
21	.018	.060	99.956						
22	.009	.030	99.986						
23	.004	.014	100.000						
24	1.084E-15	3.497E-15	100.000						
25	4.098E-16	1.322E-15	100.000						
26	1.530E-16	4.934E-16	100.000						
27	8.345E-17	2.692E-16	100.000						
28	-1.605E-16	-5.178E-16	100.000						
29	-4.235E-16	-1.366E-15	100.000						
30	-6.030E-16	-1.945E-15	100.000						
31	-7.351E-16	-2.371E-15	100.000						

Extraction Method: Principal Component Analysis.

Table 15- The proportionality degree of the main components in human science final model

General factor	Completely adequate	Adequate	Some adequate	Not adequate	Completely not adequate	%
Preparation	26	3	1	-	-	86.66
Education running	25	4	1	-	-	83.33
Education discussion	28	1	1	-	-	93.33
Evaluation	27	2	1	-	-	90.0
Correction act	28	2	-	-	-	93.33

DISCUSSION AND CONCLUSION

Preparation

In any program and to achieve the given goals, planning and preparation is necessary to provide required strategies. Indeed, preparation and planning are the most important elements or management stage approved by all the theories and models in management and teaching methods.

Preparation is one of main components of optimal model of education sciences including minor components, educational need assessment, the investigation of time, place, and content limitations, explaining the unknown, selection of content , the proper working method, good teaching method, budget, determination of teacher and student responsibility, coordination and leadership. Some of the theories and compatible researchers of minor components in preparation are including the theories of Robert Veglizer (1961), Hilda Taba (1966), Gordon (1961), and Harrison (1998).

Performing teaching

The second main component of optimal model of educational science is teaching performance. If during teaching ,after the selecting the teaching method, the teacher doesn't perform leaning and teaching process very well, even he did the best for preparation, in case of wrong performance of the teaching program, he will never achieve the final goal. Design, lesson preparation, Pilot teaching, delivery of documents and education, considering the change trend and the connection of teaching methods and communicating with effective learning factors are the minor factors of teaching being compatible with gauge (1963), Dubin (1968), Blum (1953), Gordon (1961), Cler (1983).

Teaching analysis

Learning –teaching process should be analyzed carefully. The teaching analysis is one of the other main components of educational science optimal model including minor components, condition analysis, the analysis of environmental factors including external and internal, the analysis of goals and values, the analysis of created limitations and analysis of education technology application and these factors are compatible with the theories of Gordon (1961), Shaftel (1982), Minsburg (1997), Ausubel (1963), Cler (1983)

Assessment

Assessment is a means to modify the performance of a program and 2 main goals are considered for assessment:

- 1- The investigation and modification of the content of education program and teaching method
- 2- The assurances of having access to goals were defined. The fourth main component of optimal model in educational science lessons is an assessment component that is necessary in the selection and using the best teaching methods and in teaching process. The assessment is the most important component to obtain feedback about the effect of the teaching method obtained by the teacher. This is including minor components, Pre-test, need assessment, formative assessment and additional assessment that is compatible with the theories of Brunerogunda (1967), Slavin (1991), Hey wood (1992) and Shaftel (1982)

Corrective action

One of the main components of educational science lessons optimal model is feedback that provides the required information about the amount of having access to goals and determined results and also re-starting the program. This is consisting of minor components, results assessment, determination of strong points and weak points, opportunities and threats, and determination of resources and time limit that are compatible with the theories of Meninzburg (1997), Slavin (1991), Blum (1968), Thelen (1960), Oliver and Shaver (1984).

As the purpose of this research is the investigation of the change in the teaching methods in the past 100 years and for designing a model in human science, by considering the existing condition in different teaching methods, it was defined that in the past the responsibility of education center was the delivery of a number of graduates who can just make a living with it. But it seems that in the third millennium, education systems have passed this stage, and preparing students just to make a living is not adequate any more. In fact, education systems should prepare students for an innovative and human life in order that their education meets the requirements, hops and interests of a person. If we know learning very well, it will be a miracle. We should try to provide good conditions, and the conditions are not met, otherwise, we use a good teaching method. In the second stage of the model design, we found that this model is consisting of 5 main components and 31 minor components and its proportionality degree in a separate questionnaire given to human science experts was approved as 89.30.

Suggestions

- 1- Teaching service courses about teaching methods and other related concepts for faculties and teachers.
- 2- Providing necessary facilities to apply new teaching methods and providing the necessary equipments and education technology
- 3- Providing the required books and journals for teachers and lecturers about the best teaching models
- 4- Emphasize on student-centered methods
- 5- The specialty of faculties, teachers and lecturers in the selection of the effective teaching methods
- 6- Research activities of faculties about the studied lessons to use teaching new methods.

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