

Surveying selection principles and method of organizing content of university curriculum based on public aspects of information and communication technology or (ICT)

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ABSTRACT: The present study aimed to study the principles of selecting and organizing the academic content of the curriculum based on general aspects of information and communication technology (in term of experts' viewpoints). Research methodology was applied regarding it's' purpose and descriptive-collective in terms of nature of work. The statistical population of current study consists of all faculty members of curriculum fields, educational technologist and e-learning specialists at the University of Tehran, which based on Cochran formula, 58 individuals were considered as a statistical samples and they were chosen based on combination of cluster, random and stratified methods. Collection tool of questionnaire's data is researcher-made that includes general information and closed section of 49 questions which based on Likert spectrum, that is designed in 5 answers choices that represent the level of application of information and communication technology in selection practices and organizing content based on experts' viewpoints. Validity of the questionnaire gained using Cronbach's alpha coefficient, equals to 0/769 percent. Findings of the research suggest that in each 12 components, the average of the participants' responses were too high and the third component with the average of **28/45** and the ninth component with average of 1.7 have the most and least application respectively and variance analysis test results showed that between the application of the selection principles and curriculum organizing content there is significant differences regarding information and communication technology (ICT) in 12 components of the test.

Keywords: curriculum, information technology, content selection, content organizing.

INTRODUCTION

In the age of information and communication technology or ICT that in a sense it is been remembered as a knowledge- based era, it is believed that modern ICTs that consist of virtual reality and artificial intelligence, has made fundamental changes in the world of education with strong industrial revolution, in a way that it can compete with industrial revolution of the nineteenth century. Today in the developed countries to fulfill the motto of education in every time and place, modern technologies are been used and in recent years there have been many changes in the ways and methods of teaching and instruction (Hamidi and Hadadi , 2007 , p 2). ICT's entry to education system is the information world's most important gift, a phenomenon that its entry into the world of teaching, has provided fundamental changes and it is the most distinctive aspect of training to be compare with the past (Toffler, translation aspects , 1993 , p 58) . By extending the growing technologies of information and communication on the one hand and the increasing demand for knowledge and to enhance skills in the selection, processing and transferring useful information on the other hand, organizations which they related to education especially ministry of education are directly forced to make rethinking in teaching ,learning and curriculum reconstruction. Ministry of education is been committed to enrich and using proper methods of organizing curriculum content to create balance between learning

and learning sources. Entering this phenomenon to education especially in the field of curriculum has made major changes in the area of curriculum development as well as organizing the content (Fathi and Ejargah, 2002, p 51).

To concern the needs and abilities of learners at different stages of growth and meet social needs to develop the goals and the selection of content is been considered suboptimal. In this case the curriculum doesn't have its' stance and its' real necessity. General principles for the selection of learning experiences and activities in the curriculum planning process can be raised in this way.

The first general principle in curriculum planning to choose learning activities is that students to reach specific objectives must have some activities and experiences. These activities and experiences give them opportunities to practice and perform desired activity. For example, if the goal is to oversee the development of problem-solving ability and skills, it is possible only when experiences and learning activities, give different opportunities to students to solve problems. Second overall principle for selecting learning activities and experiences in the process of curriculum development is that learning experiences should be chosen in a way that students has satisfaction of doing variety of behaviors that meet learning objectives and the desired attention and they should learn related experiences.

The third general principle of learning experiences in curriculum development, suggesting that the reactions of the intended learning experiences and activities must be in the areas of intellectual property and intellectual abilities of students. In other words, learning experiences and activities must be consistent with students' intellectual development, knowledge, intelligence, talent and ability. The fourth overall selection in the process of curriculum suggesting that to meet a goal of education system, various activities and experiences can be used. As far as learning experiences are consistent with the criteria and standards of learning, they can be used to achieve the goals and objectives effectively and in a proper way. The numbers of learning experiences and activities that can be used to achieve educational and cultural goals are a lot and they are unlimited.

The fifth and last general principle in the choice of experiences in curriculum development indicate that usually an experience and learning activity by fixing students' problem in a specific field, can improve their knowledge in the same case. For example students by solving their health-related problems, will be familiar with a series of information relating to health and other related points (Same source).

Today, schools based on analysis' needs should coordinate themselves with learners ' needs, interests and capabilities and growth developments and recognize the needs in general cases. Social developments have vast impact of the curriculum content. Nowadays some roles are taken from the families and devolve to the schools. Now schools will be asked to take more responsibilities in the training. Among the factors that influenced the content of the curriculum is the question of science explosion. The explosion of human knowledge impressed curriculum in various ways, for example there have been evolution and transformation in organizing the knowledge of teaching methods, curriculum approaches – learning and evaluation.

The purpose of organizing the content of the curriculum is that a point be organized in the form of logical and scientific concept in accordance with the scientific rules. With these concepts and the necessity of regarding selection and organizing the content of the curriculum and the impact that ICT has over curriculum, it can be said that the main objective of this study is to investigate the practices of using information and communication technology in selection and organizing the content of the curriculum, that is intended to examine ways of using selection and organization practices and decided to check whether these practices can be used in selecting or organizing contents in perspectives of professionals? In any case, it is necessary that before using information technology to modern practices, we must concern scientific and cultural field for that matter. Because the basis of the selection and organization of content is knowledge transfer and knowledge is nothing but known information. It is necessary to transmit the information, appropriate skills and background to be fit for that matter. So it can be said that the accuracy in the role of information and communication technology in teaching and training of thoughtful and capable students indicated the necessity of transformation regarding information and communication technology in national education through selection and organization of excellent curriculum content, especially for higher education more than before.

Research methodology

Generally the study emphasized public discovery and generalization. Research is regular, detailed and expertly study on phenomena. The definition of the research as a research process is a form of academic knowledge (Delawar, 1999, p. 48). Chosen research method depends on the nature of the subject, the research objectives and research questions that ethical considerations control research's subject, its extent and possibilities of its performance. (Naderi and SeifNaraghi, 2000).

Current study is descriptive- survey type. Descriptive researches have applied as well as basis aspects. From applied aspect, study's results are used in decision and policy making as well as planning; planning for social, economic, political and training phenomenon that involves prediction and estimating future status and future of

subjects which they are among planning. Knowing the status of past and present of that point and knowing behavior, variables and parameters, and to determine the coefficient of their variation and the index to estimate and predict them is necessary and has importance. To reach these indicators and defining current statue and predict future based on current condition requires descriptive researches to illustrate them for planning. (Hafeznia, 2002, p 63). Survey research is used to investigate distribution of property of a statistical community. This type of research can be used for answering questions like the nature of the research, the terms of the existing situation and the relationship between events. (Sarmad, 2003, p 82). Survey method requires expertise and combined planning with the initiative and the analysis, interpretation of data and preparing logic and skillful report about the findings (Pasha sharifi, 2002, p. 128). So in this study, selection and organizing the content of the curriculum in ICT-based system is been surveyed and studied from the perspective of e-learning professionals, curriculum planners and educational technologists in survey method and Delphi type.

Subjects

Study's subjects were 70 curriculum, educational technology and e-learning teachers from (Tehran, ShahidBeheshti, Tabatabai, TarbiatModares, TarbiatMoalem and Islamic Azad (science and research branch),) universities. For the sample, since study has three samples (Society Curriculum, Educational Technology Society, and the Society of electronic learning), at first, cluster sampling method is used and after indicating universities, stratified sampling method is used to specify experts. Volume of each sample is been determined proportionally to the extent that it formed population size and then members were selected in simple random method.

Tools for data collection

Data collection method in this study is based on using package questionnaire, questions are designed in two parts: general aspects and main questions (49 questions) which based on Likert scale, there are 5 answers for each question from 1 to 5 that are called (very low, low, medium, high and very high) and indicated applicability of each of selection methods and content organization in ICT-based system. Using Cronbach's alpha, gained correlation rate of questionnaire's objects is %769 that indicates acceptable durability.

Methods for data analysis

In this study, collected data were analyzed using Spss software and the results are presented in two parts as a descriptive and inferential statistics. In descriptive statistics section, main indicators such as frequency, percentage, mean, tables, charts and scattering parameters such as standard deviation and variance, are used. In inferential statistics section to answer questions, one to three studies of chi-square test and to answer the fourth research question, ANOVA (F Fisher) is used.

RESULTS AND DISCUSSION

Results

Demographic characteristics of the questionnaire includes the name of university as a teaching place, academic rank and profession that among 58 participants in this study, 52 objects equals 89/7 percent of the total sample, were male and 6 objects equals 10/3 percent were female. Beside, 3 participants equals 5/8 percent of total sample hold PhD degree, 17 participants equal to 29/3percent were PhD student and 7 participants equal to 12/1 percent hold master's degree . Field of 28 participants equal to 48/3 percent of total sample, was curriculum, 28 participants equals 48/3 percent had educational technology field and field of 2 participants equals 3/4 percent of total sample was e-learning. To investigate the research questions, chi-square test and to determine triple group idea, ANOVA (F Fisher) is been used.

Study's first question: How can ICT, be used in principle of importance of selecting curriculum content? Regarding the information contained in table 1 and based on questions of using ICT in principle of importance of selecting curriculum content, 4/44 percent has chosen very low option, 6/18 percent low option, 17/58 percent medium option, 43/46 percent high option and 28/28 percent selected very high option. In this case, information and communication technology has high usage to choose curriculum content from content importance aspect.

Regarding given significant level in table 2 above that equals 0/017 and to compare it with free error 0/05 ,with 95% certainty H_0 hypothesis is rejected, means there is difference between observed and expected distribution and it means that using ICT has high importance in necessity of curriculum content. In other side, since obtained Chi-square value (24/483) is higher than Chi-square table of (5/22), above result is confirmed.

Study's second question: How can ICT, be used in validity principle of selecting curriculum content?

Regarding the information contained in table 3 and based on questions of using ICT in validity principle of selecting curriculum content, 3/4 percent has selected very low choice, 3/4 percent low choice, 19/53 percent medium choice, 45/4 percent high option and 28/17 percent selected very high option. In this case, information and communication technology is useful to choose curriculum content from content validity aspect.

Regarding given significant level in table 4 above that equals 0/00 and to compare it with free error 0/05 , with 95% certainty H_0 hypothesis is rejected, means there is difference between observed and expected distribution and it means that using ICT in validity principle of curriculum content has high usage. In other side, since obtained Chi-square value (50/276) is higher than Chi-square table of (3/32), above result is confirmed.

Study's third question: How can ICT, be used in interest principle of selecting curriculum content?

Regarding the information contained in table 5 and in term of questions of using ICT in interest principle of selecting curriculum content, 3/85 percent has selected very low choice, 3/85 percent low choice, 18/975 percent medium option, 44/8 percent high option and 28/45 percent has selected very high option. In this case, information and communication technology to choose curriculum content from content interest aspect is useful in high rate.

Regarding given significant level in table 6 above that equals 0/00 and to compare it with free error 0/05, with 95% certainty H_0 hypothesis is rejected, means between observed and expected distribution, there is difference and it means that using ICT in interest principle of curriculum content has high usage. In other way, since obtained Chi-square value (45/448) is higher than Chi-square table of (3/32), above result is confirmed.

Study's fourth question: How can ICT, be used in usefulness principle of selecting curriculum content?

Based on the information contained in table 7 and regarding questions of using ICT in usefulness principle of selecting curriculum content, 6/58 percent has chosen very low choice, 5/86 percent low choice, 18/62 percent medium choice, 43/8 percent high option and 25/58 percent selected very high option. In this case, information and communication technology to choose curriculum content from content usefulness aspect is very useful.

In term of given meaningful level in table 8 above that equals 0/00 , and to compare it with free error 0/00, with 95% certainty H_0 hypothesis is rejected, means there is difference between observed and expected distribution and it means that using ICT in usefulness principle of curriculum content has high usage. In other way, since obtained Chi-square value (45/448) is higher than Chi-square table of (3/32), above result is confirmed.

Study's fifth question: How can ICT, be used in learning ability's principle of selecting curriculum content?

Regarding data contained in table 9 and based on questions of using ICT in learning ability's principle of selecting curriculum content, 5/54 percent has selected very low choice, 6/58 percent low choice, 16/56 percent medium choice, 46/22 percent high option and 25/18 percent selected very high items. In this case, information and communication technology to choose curriculum content from content's learning ability aspect has high usage.

Regarding given significant level in table 10 above that equals 0/000 and to compare it with free error 0/05, with 95% certainty H_0 hypothesis is rejected, means between observed and expected distribution, there is difference and it means that using ICT in learning ability's principle of curriculum content has high importance. In other side, since obtained Chi-square value (61/586) is higher than Chi-square table of (7/96) and above result is confirmed.

Study's sixth question: How can ICT, be used in flexibility principle of selecting curriculum content?

Regarding the information contained in table 11 and in term of questions of using ICT in flexibility principle of selecting curriculum content, 4/75 percent has chosen very low choice, 5/175 percent low choice, 15/525 percent medium option, 51/3 percent high option and 23/25 percent selected very high choice. In this case, information and communication technology is very useful to choose curriculum content from content's flexibility aspect.

Regarding given significant level in table 12 above that equals 0/00 and to compare it with free error 0/05, with 95% certainty H_0 hypothesis is rejected, means there is difference between observed and expected distribution and it means that using ICT in flexibility principle of curriculum content has high usage. In other side, since obtained Chi-square value (46/488) is higher than Chi-square table of (5/22), above result is confirmed.

Study's seventh question: How can ICT, be used in organizing sequence principle of selecting curriculum content?

Regarding the information contained in table 13 and based on questions of using ICT in organizing sequence principle of selecting curriculum content, 4/3 percent has selected very low choice, 6/475 percent low choice, 16/825 percent medium choice, 47/85 percent high option and 24/55 percent selected very high option. In this case, information and communication technology is very useful to choose curriculum content from content's organizing sequence aspect.

Regarding given significant level in table 14 above that equals 0/001 and to compare it with free error 0/05, with 95% certainty H_0 hypothesis is rejected, means there is difference between observed and expected distribution and it means that using ICT in organizing sequence principle of curriculum content has high usage. In other side, since obtained Chi-square value (46/448) is higher than Chi-square table of (5/22), above result is confirmed.

Study's eighth question: How can ICT, be used in organizing continuity principle of selecting curriculum content?

Based on contained data in table 15 and regarding questions of using ICT in organizing continuity principle of selecting curriculum content, 52/9 percent has chosen very low choice, 2/83 percent low choice, 5/17 percent medium choice, 16/67 percent high option and 22/4 percent selected very high option. In this case, information and communication technology is useful to choose curriculum content from content's organizing continuity aspect.

Regarding given significant level in table 16 above that equals 0/00 and to compare it with free error 0/05, with 95% certainty H_0 hypothesis is rejected, means there is difference between observed and expected distribution and it means that using ICT in organizing continuity principle of curriculum content is very useful. In other side, since obtained Chi-square value (41/931) is higher than Chi-square table of (2/73), above result is confirmed.

Study's ninth question: How can ICT, be used in organizing extent principle of selecting curriculum content?

Regarding the information contained in table 17 and in term of questions of using ICT in extent principle of selecting curriculum content, 1/7 percent has selected very low choice, 1/7 percent low choice, 18/62 percent medium choice, 55/18 percent high option and 22/74 percent selected very high items. In this case, information and communication technology is very useful to choose curriculum content from content's organizing extent aspect.

Regarding given significant level in table 18 above that equals 0/00 and to compare it with free error 0/05, with 95% certainty H_0 hypothesis is rejected, means there is difference between observed and expected distribution and it means that using ICT in organizing extent principle of curriculum content has high usage. In other side, since obtained Chi-square value (33/414) is higher than Chi-square table of (3/32), above result is confirmed.

Study's tenth question: How can ICT, be used in organizing balance principle of selecting curriculum content?

Based on data contained in table 19, 4-1-13-1 and regarding questions of using ICT in balance organizing principle of selecting curriculum content, 4/57 percent has selected very low choice, 2/83 percent low option, 13/8 percent medium option, 54 percent high option and 24/7 percent selected very high option. In this case, information and communication technology is useful to choose curriculum content from content's organizing balance aspect.

Regarding given significant level in table 20 above that equals 0/00 and to compare it with free error 0/05, with 95% certainty H_0 hypothesis is rejected, means there is difference between observed and expected distribution and it means that using ICT in organizing balance principle of curriculum content has high usage. In other side, since obtained Chi-square value (29/207) is higher than Chi-square table of (2/73), above result is confirmed.

Study's 11th question: How can ICT, be used in organizing vertical relation principle of selecting curriculum content?

Regarding data contained in table 21 and based on questions of using ICT in vertical relation organizing principle of selecting curriculum content, 3/85 percent has selected very low choice, 3/4 percent low choice, 14/65 percent medium choice, 51/275 percent high choice and 26/75 percent selected very high choice. In this case, information and communication technology is very useful to choose curriculum content from content's organizing vertical relation aspect.

Regarding given significant level in table 22 above that equals 0/00 and to compare it with free error 0/05, with 95% certainty H_0 hypothesis is rejected, means there is difference between observed and expected distribution and it means that using ICT in organizing vertical relation principle of curriculum content has high usage. In other side, since obtained Chi-square value (47/103) is higher than Chi-square table of (4/57), above result is confirmed.

Study's 12th question: How can ICT, be used in organizing horizontal relation principle of selecting curriculum content?

Regarding the information contained in table 23 and based on questions of using ICT in horizontal relation organizing principle of selecting curriculum content, 6/9 percent has selected very low choice, 6/475 percent low choice, 14/225 percent medium choice, 49/15 percent high choice and 23/25 percent selected very high choice. In this case, information and communication technology is useful to choose curriculum content from content's organizing horizontal relation aspect.

Regarding given significant level in table 24 above that equals 0/007 and to compare it with free error 0/05, with 95% certainty H_0 hypothesis is rejected, means there is difference between observed and expected distribution and it means that using ICT in organizing horizontal relation principle of curriculum content has high usage. In other side, since obtained Chi-square value (28/897) is higher than Chi-square table of (5/89), above result is confirmed.

Conclusion table 25: Regarding value $F = 2/186$ and significance level 0/122 and to compare it with error rate 0/05, it concluded that there is no significant difference in selection of academic curriculum content among triple groups.

Conclusion table 26: Regarding value $F = 4/705$ and significance level 0/004 and to compare it with error rate 0/05, it concluded that there is significant difference in organizing academic curriculum content among triple groups.

Discussion

In the age of information and communication technology or ICT that in a sense it is been remembered as a knowledge- based era, it is believed that modern ICTs that consist of virtual reality and artificial intelligence, has made fundamental changes in the world of education and it makes powerful industrial revolution in a way that it can compete with industrial revolution of the nineteenth century. Modern information and communication technologies as an innovation stimulant point, beside changes in different aspects of human civilization, provides possibilities that has changed education view into learning. By extending growing technologies of information and communication on one hand and the increasing demand for knowledge and increasing skills in the selection, processing and transferring useful information on the other hand , organizations which they related to education especially ministry of education are directly forced to make rethinking in teaching ,learning and reconstruction curriculum . Ministry of education is been committed to enrich and using proper methods of organizing curriculum content to create balance between learning and learning sources. This study investigated ways to select and organize curriculum content based on public aspects of information and communication from specialists' perspective. The findings showed that the first component of the 5 items that related to the principle of importance of curriculum content, the item of << in-service trainings (e-learning practices) for teachers>>, has highest usage in this item, findings of this item is consistent with Azadmanesh' research(findings ,2001) which he investigated possibility of using information and communication technology in higher education curricula in terms of Shahid-Beheshti University faculty, experts in information and communication technology in education curricula in 2001. From three items of second component that related to validity principle of the curriculum content, the item "providing material using multimedia CD" contains the most useful points in this case; findings of this item are consistent with previous results of John Goodban. From 4 items of third component that related to interest principle of selecting curriculum content, the item ' presenting style based on group research " has the most useful points in this item. From 5 items of fourth component that was related to the usefulness of the selection of curriculum content, the item ' finding data by the search engines ' is the most useful point in this item and findings in this case are consistent with the findings of John Goodban.From5 items of fifth component that related to learning ability principle of curriculum content, the items " use of digital libraries "" teachers participation in training courses of Information Technology "and" computer- aided materials design " have highest usage in this item. From four items of the sixth component that was related to flexibility principle of selecting curriculum content, the item " to form online groups and forums " has highest usefulness in this component .

From four items of seventh component that was related to sequence organization of the curriculum content , the items ' presenting material in simulated environment " has highest usefulness in this item, these findings are consistent with (Imam Joma and MullaiNejhad ,2002) as well as John Goodban's results. , From three items of eighth component related to continuation of organization in curriculum content , the item ' online exams via internet or university network " has the highest usage in this component, findings of this section are consistent with Imam Joma and Mullai's results (200), they found that by accessing technologies, variety of activities like: practice, research, discussion on the line (online) can be used in the curriculum to provide students with deeper learning activities. From five items of ninth component that corresponds to the extent of organizing the content of the curriculum, the item "conducting pre-test for students to make them ready through web site," and "offer and receive the course assignments through teachers or masters' sites or email» has highest usage in this component, findings of this component are consistent with results of(Imam Joma, MulaiNejhad ,2007), (NahidAzadmsh ,2006) and Zhuman Shan. From three items of 10th component that corresponds to the principle of organizing balance in curriculum content, the item "use of electronic library resources by teachers" has highest usefulness in this component. From four items of the eleventh component that corresponds to the principle of organizing vertical relation of the curriculum content, the item "presenting material as a training plan" has the most application in this component, the findings of this component are consistent with research results of (Zulghadri ,2006) that evaluated new methods of organizing content based on experts' curriculum planning and beside, findings of the research by (Ghafari et al .,2011) was supported. From four items of twelfth component that corresponds to the principle of organizing horizontal relation of curriculum content, the item, "providing appropriate site to present curriculum materials" has highest application in this component, the findings of this component were consistent with Zulqadri's research (results ,2006) that evaluated new methods of organizing content based on experts' viewpoints about curriculum and findings of (Ghafari et al .,2011) were supported as well. Therefore, according to the above results, it is necessary that general aspects of information and communication technology be concerned, beside if universities are going to be successful in dealing with their issues and challenges, their management should emphasis these technologies and by discovering current obstacles, they must do main actions. Therefore in this case, it is necessary that universities' teaching strategies be reformed to be consistent with needs and expectations of students and society, and in the educational curricula and planning, new technology must be concerned and instead of more emphasis over quantity aspects, such as the

number of students, knowledge of qualitative aspects such as improving participation of professors and students in the use of technology in curriculum activities must be emphasized. Professors as well universities shouldn't be satisfied with their existing knowledge and skills and they always have to update their knowledge and materials. Beside, by using appropriate teaching practices that emphasizes exploring and reflecting students' attitudes toward educational points; students' learning can be improved. To strengthen the partnership-based relations, it is necessary that departments and faculties have more relations and communications with organizations inside and outside the country and in this way, the needs of different parties can be provisioned. Also according to the results obtained from this study, it is recommended following objects be investigated and reviewed in separate researches and studies.

- Methods of taking advantage of ICT in selecting the content of the curriculum to be evaluated.
- Application methods of ICT in organizing curriculum content to be examined.
- The process of distance learning to select and organize the content of the curriculum to be used and applied.
- The role of educational television in the retraining of experts and authors as well as curriculum specialists to be reviewed.
- Methods of selecting and organizing the content in the form of simulated environments to be investigated.
- Methods of taking advantage from digital library in the system of ICT-based training, to be trained to individuals.
- Methods of online group training and educational training to be included in the academic curriculum.

Table 1. Frequency distribution table and selection choices percent in using ICT in principle of importance of selecting curriculum content component

Non-response	Very high		high		medium		low		Very low		questions
	percent	frequency	percent	frequency	percent	frequency	percent	frequency	percent	frequency	
0	24/1	14	34/5	20	17/2	10	15/5	9	8/6	5	1
0	32/8	19	32/8	19	25/9	15	5/2	3	3/4	2	2
0	29/3	17	50/0	29	13/8	8	3/4	2	3/4	2	3
0	27/6	16	50/0	29	15/5	9	3/4	2	3/4	2	4
0	27/6	16	50/0	29	15/5	9	3/4	2	3/4	2	5
0	28/28		43/46		17/58		6/18		4/44		Total percent

Table 2. Statistical test table of using ICT in principle of importance of selecting curriculum content

Principle of importance of selecting curriculum content	
24/483	Chi-square value
12	Freedom rate
0/017	Significance level

Table 3. Frequency distribution table and selection choices percent in using ICT in validity principle of selecting curriculum content component

Non-response	Very high		high		medium		low		Very low		questions
	percent	frequency	percent	frequency	percent	frequency	percent	frequency	percent	frequency	
0	27/6	16	43/1	25	22/4	13	3/4	2	3/4	2	6
0	29/3	17	43/1	25	20/7	12	3/4	2	3/4	2	7
0	27/6	16	50/0	29	15/5	9	3/4	2	3/4	2	8
0	28/17		45/4		19/53		3/4		3/4		Total percent

Table 4. Statistical test table of using ICT in validity principle of choosing curriculum content

Validity principle of selecting curriculum content	
50/276	Chi-square value
9	Freedom rate
0/00	Significance level

Table 5. Frequency distribution table and selection choices percent in using ICT in interest principle of selecting curriculum content component

Non-response	Very high		high		medium		low		Very low		questions
	percent	frequency	percent	frequency	percent	frequency	percent	frequency	percent	frequency	
0	31/0	18	46/6	27	15/5	9	15/5	9	8/6	2	9
0	27/6	16	46/4	27	19/0	11	5/2	3	3/4	2	10
0	25/9	15	41/4	24	25/9	15	3/4	2	3/4	2	11
0	29/3	17	44/8	26	15/5	9	5/2	3	5/2	3	12
0	28/45		44/8		18/975		3/85		3/85		Total percent

Table 6. Statistical test table of using ICT in interest principle of choosing curriculum content

Interest principle of selecting curriculum content	
45/488	Chi-square value
9	Freedom rate
0/00	Significance level

Table 7. Frequency distribution table and selection choices percent in using ICT in usefulness principle of selecting curriculum content component

Non-response	Very high		high		medium		low		Very low		questions
	percent	frequency	percent	frequency	percent	frequency	percent	frequency	percent	frequency	
0	27/6	16	36/2	21	20/7	12	10/3	6	5/2	3	13
0	25/9	15	46/6	27	17/2	10	5/2	3	5/2	3	14
0	29/3	17	44/8	26	15/5	9	5/2	3	5/2	3	15
0	24/4	13	43/1	25	19/0	11	3/4	2	12/1	7	16
0	20/7	12	48/3	28	20/7	12	5/2	3	5/2	3	17
0	25/58		43/8		18/62		5/86		6/58		Total percent

Table 8. Statistical test table of using ICT in usefulness principle of choosing curriculum content

Usefulness principle of selecting curriculum content	
42/828	Chi-square value
16	Freedom rate
000	Significance level

Table 9. Frequency distribution table and selection choices percent in using ICT in learning ability's principle of selecting curriculum content component

Non-response	Very high		high		medium		low		Very low		questions
	percent	frequency	percent	frequency	percent	frequency	percent	frequency	percent	frequency	
0	27/6	16	48/3	28	13/8	8	5/2	3	5/2	3	18
0	27/6	16	48/3	28	13/8	8	5/2	3	5/2	3	19
0	24/1	14	43/1	25	22/4	13	5/2	3	5/2	3	20
0	27/6	16	48/3	28	13/8	8	5/2	3	5/2	3	21
0	19/0	11	43/1	25	19/0	11	12/1	7	6/9	4	22
0	25/18		46/22		16/56		6/58		5/54		Total percent

Table 10. Statistical test table of using ICT in learning ability's principle of choosing curriculum content

Learning's ability principle of selecting curriculum content	
61/586	Chi-square value
16	Freedom rate
0/00	Significance level

Table 11. Frequency distribution table and selection choices percent in using ICT in flexibility principle of selecting curriculum content component

Non-response	Very high		high		medium		low		Very low		questions
	percent	frequency	percent	frequency	percent	frequency	percent	frequency	percent	frequency	
0	24/1	14	51/7	30	13/8	8	5/2	3	5/2	3	23
0	24/1	14	46/6	27	22/4	13	3/4	2	3/4	2	24
0	24/1	14	51/7	30	13/8	8	5/2	3	5/2	3	25
0	20/7	12	55/2	32	12/1	17	6/9	4	5/2	3	26
0	23/25		51/3		15/525		5/175		4/75		Total percent

Table 12. Statistical test table of using ICT in flexibility principle of choosing curriculum content

flexibility principle of selecting curriculum content	
46/448	Chi-square value
12	Freedom rate
0/00	Significance level

Table 13. Frequency distribution table and selection choices percent in using ICT in organizing sequence principle of selecting curriculum content component

Non-response	Very high percent	high percent	medium percent	low percent	Very low percent	questions
0	24/1	50/0	12/1	8/6	5/2	27
0	25/9	46/6	19/0	5/2	3/4	28
0	24/1	51/7	13/8	5/2	5/2	29
0	24/1	43/1	22/4	6/9	3/4	30
0	24/55	47/85	16/825	6/475	4/3	Total percent

Table 14. Statistical test table of using ICT in organizing sequence principle of choosing curriculum content organizing sequence principle of selecting curriculum content

34/345	Chi-square value
12	Freedom rate
0/001	Significance level

Table 15. Frequency distribution table and selection choices percent in using ICT in organizing continuity principle of selecting curriculum content component

Non-response	Very high percent	high percent	medium percent	low percent	Very low percent	questions
0	22/4	48/3	22/4	3/4	3/4	31
0	20/7	55/2	15/5	5/2	3/4	32
0	24/1	55/2	12/1	6/9	1/7	33
0	22/4	52/9	16/67	5/17	2/83	Total percent

Table 16. Statistical test table of using ICT in organizing continuity principle of choosing curriculum content organizing continuity principle of selecting curriculum content

41/931	Chi-square value
8	Freedom rate
0/00	Significance level

Table 17. Frequency distribution table and selection choices percent in using ICT in organizing extent principle of selecting curriculum content component

Non-response	Very high percent	high percent	medium percent	low percent	Very low percent	questions
0	20/7	46/6	29/3	1/7	1/7	34
0	22/4	56/9	17/2	1/7	1/7	35
0	24/1	58/6	13/8	1/7	1/7	36
0	24/1	58/6	13/8	1/7	1/7	37
0	22/4	55/2	19/0	1/7	1/7	38
0	22/74	55/18	18/62	1/7	1/7	Total percent

Table 18. Statistical test table of using ICT in organizing extent principle of choosing content curriculum organizing extent principle of selecting curriculum content

33/414	Chi-square value
10	Freedom rate
0/00	Significance level

Table 19. Frequency distribution table and selection choices percent in using ICT in organizing balance principle of selecting curriculum content component

Non-response	Very high percent	high percent	medium percent	low percent	Very low percent	questions
0	24/1	58/6	13/8	1/7	1/7	39
0	24/1	50/0	13/8	3/4	8/6	40
0	25/9	53/4	13/8	3/4	3/4	41
0	24/7	54	13/8	2/83	4/57	Total percent

Table 20. Statistical test table of using ICT in organizing balance principle of choosing content curriculum organizing balance principle of selecting curriculum content

29/207	Chi-square value
8	Freedom rate
0/00	Significance level

Table 21. Frequency distribution table and selection choices percent in using ICT in organizing vertical relation principle of selecting curriculum content component

Non-response	Very high percent	high frequency	high percent	frequency	medium percent	frequency	low percent	frequency	Very low percent	frequency	questions
0	25/9	15	53/4	31	13/8	8	3/4	2	3/4	2	42
0	27/6	16	50/0	29	15/5	9	3/4	2	3/4	2	43
0	27/6	16	51/7	30	12/1	7	3/4	2	5/2	3	44
0	25/9	15	50/0	29	17/2	10	3/4	2	3/4	2	45
0	26/75		51/275		14/65		3/4		3/85		Total percent

Table 22. Statistical test table of using ICT in organizing vertical relation principle of choosing content curriculum organizing vertical relation principle of selecting curriculum content

47/103	Chi-square value
11	Freedom rate
0/00	Significance level

Table 23. Frequency distribution table and selection choices percent in using ICT in organizing horizontal relation principle of selecting curriculum content component

Non-response	Very high percent	high frequency	high percent	frequency	medium percent	frequency	low percent	frequency	Very low percent	frequency	questions
0	24/1	14	50/0	29	13/8	8	6/9	4	5/2	3	46
0	24/1	14	50/0	29	12/1	7	6/9	4	6/9	4	47
0	22/4	13	55/2	32	13/8	8	5/2	3	3/4	2	48
0	22/4	13	41/4	24	17/2	10	6/9	4	12/1	7	49
0	23/25		49/15		14/225		49/15		23/25		Total percent

Table 24. Statistical test table of using ICT in organizing horizontal relation principle of choosing content curriculum organizing horizontal relation principle of selecting curriculum content

28/897	Chi-square value
13	Freedom rate
0/007	Significance level

Table 25. Variance analysis table of course' triple groups in organizing academic curriculum content

	Sum of squares	Frequency rate	Average of squares	F value	Meaningful level
Among -group	2/108	2	1/054	4/705	0/004
Inter -group	12/329	55	0/224		
total	13/436	57			

Table 26. Variance analysis table of course' triple groups in selecting academic curriculum content

	Sum of squares	Frequency rate	Average of squares	F value	Meaningful level
Among -group	0/588	2	0/294	2/186	0/122
Inter -group	7/398	55	0/135		
total	7/986	57			

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