THE NECESSITY AND APPLICABILITY LEVELS OF THE COURSES THAT ARE OFFERED IN THE DEPARTMENTS OF COMPUTER EDUCATION AND INSTRUCTIONAL TECHNOLOGIES (CEIT)

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ABSTRACT
The main purpose of this study is to identify the levels of the necessity and applicability of the courses offered in the Departments of Computer Education and Instructional Technologies based on the views of the fourt grade and graduated students. In the study descriptive research model was used. The population of the study were final-year and graduated students in the departments of computer education and instructional technologies, which were established within the faculties of education. The sample were randomly selected from fourth grade and graduate students. As an assessment tool, a questionnaire was used in data collection. In analyzing data, arithmetic mean and standard deviation were calculated and t test was used to test if there was a significant difference among variables. According to the results of the study, pedagogical formation courses, informatics and informatics education application courses were found as the most necessary courses for the branch. The least necessary courses were science and mathematics courses.

INTRODUCTION

Education and technology play important roles in the development of human beings. Both education and technology mainly aims at contributing effectively to human development. Educational technology, in a broad sense, all design processes and methods that aim at supporting and facilitating teaching and learning and motivating the students and concerning the development and implementation of programs designed based on certain teaching and learning systems (Alkan,1984). Gagne uses systematic approach to explain educational technology. According to Gagne, educational technology is the summmation of techniques that aim at effective learning and employs media in the teaching and learning environments. In Gagne's model, knowledge is organized systematically in teaching and learning contexts (İşman, 2003).

Following the developments in science and technology and utilizing them is the precondition to become a civilized society and this affects the whole society (Uluğ, 1999). Education cannot afford to lag behind developments in science and technology. The developments make it imperative that technology be used in schools. As a result of these considerations, by the Board of Education and Discipline's (BED) Resolution 180 on 26.08.1998, Elective Courses Teaching Programs was developed, and computer classes became part of the Elementary Education curriculum as an elective course at fourth and above grade levels (Vural, 2002). This new development required expert teachers to teach these courses. To fulfill this requirement and to employ teachers at secondary schools Faculty of Educations were reorganized and Computer Teaching and Instructional Technologies Departments were founded in 1997.

Teacher training is a braod and multi-dimensional issue. The selection of teacher candidates, pre-service education, teacher practice and observation and evaluation of teacher practice, in-service courses are all inculuded within the teacher training. Teachers are the most important elements in the educational system because successful and quality education is carried out by quality teachers (Kavcar, 2003).

In Turkey, from the very beginning, teacher training has always been considered to involve three aspects. Varış (1996) explains these three aspects as pedagogical knowledge, subject area knowledge, and general knowledge. Teacher candidates should take pedagogy classes, have a common general knowledge and equipped with strong subject area knowledge.

XI. National Education Council adopted parallel design method in determining the content of teacher training programs. According to this model, all pedagogy, subject area, and general knowledge courses are taught at all class levels in a parallel manner. As the classes progress, subject area courses are maintained but general knowledge courses are diminished and the number of pedagogy classes increase. In this model, the weights of the each content category is emphasized along with the content itself. According to the views adopted at XI. National Education Council, subject area courses should comprise 62,5%, pedagogy courses 25%, and general knowledge courses 12,5% of the teacher trainning programs. When we examine the content categories of

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Computer Education and Instructional Technologies Teacher Training Programs in terms of credit/class hour weight, pedagogy courses make up 25%, general knowledge courses, when we consider elective courses under this category, 23%, and subject area courses, when we consider science and math classes under this category, 52% of the curriculum. When science and math courses are not considered under subject area category the ratio of these clases is 32% which is below the recommended ratio. Therefore, it might be a meaningfull to evaluate Computer Education and Instructional Technologies Teacher Training Programs based on classes.

One of the main conditions to increase the quality of the educational institutions and to train individuals who can adapt to changes is the quality of the educational programs. Educational programs determine human profile in a country. By evaluating an institution's educational programs, it is posible to make predictions about a country's educational output (Gözütok, 2003). Developing the programs, in other words, detecting and removing inconsistencies and correcting the mistakes not only increase the quality of the programs but also the quality of the education. Making decisions that will make the programs more effective is possible by investigating the basis underlying these decisions scientifically and by evaluating the implementations (Erden, 1995). By evaluating the programs, the effectiveness of the programs are revealed and the extent to which the objectives are realized is determined.

Evaluation has four main purposes. These are assessment of merit and worth, oversight and compliance, programme and organizational improvement, and knowledge development (Fitzpatrick et. al, 2004). Evaluations may serve different purposes depending on the purpose, views, and perceptions of the evaluators (Kelly, 1989). Program evaluation is the last cycle of the program development studies and a process in determining the realization degree of educational purposes.

Program evaluation criteria and the method of program evaluation vary depending on the kind of evaluation, the approach used, and the model of program evaluation. In the process of education evaluation is generally done for two purposes (Erden, 1995). The first is the evaluation of learner success and taking the necessary precautions. The second is to make judgement concerning the effectiveness of the education programs and identify the source of the inconsistencies and fix them. Evaluation that is done for both purposes can be both norm-referenced and objective-referenced (Ertürk, 1993).

Norm-referenced evaluation: This kind of evaluation can be used to compare and select individuals; however, in terms of program development it is not sufficient (Demirel, 2004).

Objective-referenced evaluation: Objective Referenced evaluation is generally done at the beginning, during, and at the end of the program. It is divided into three groups.

1. Evaluation at the beginning of the program: Diagnostic evaluation.
2. Evaluation during the program: Formative evaluation
3. Evaluation at the end of the program: Summative evaluation (Ertürk, 1993; Yaşar,1998; Gözütok, 2003; Demirel, 2004).

The Process of Program Evaluation: The beginning of program evaluation process starts with making a good plan. While preparing an evaluation plan, the purpose of the evaluation, the purpose to which the evaluation questions will serve, the model or models to be adopted in the evaluation, the methods to be used, the data collection tools and possible assessment problems to be encountered should be taken into consideration. Different approaches adopted in program evaluation have led to the emergence of different program evaluation models. The main different evaluation models are as follows:

Objectives-Oriented Program Evaluation (Behavioral Objective) Model: Pioneered by Tyler, this model is based on assessing behavior changes in learners as a result of the objectives determined at the beginning of the program. According to Erden (1995) objective-oriented evaluation is appropriate for experimental research methods.

Decision Making Model: (Stufflebeam's Context, Input, Process and Product Evaluation Model) According to this model, the purpose of evaluation is to inform decision makers about the inputs, processes, and outputs of the program under evaluation (Fitzpatrick et. al, 2004).

Goal Free Decision Making Model: In this model, developed by Scriven, the adequacy of the educational objectives to meet the needs is determined.

Proficiency Model: In this model a commission comprising the staff, administrators, professionals, citizens, parents and students identify the standards to evaluate the program (Gözütok, 2003).

Provus's Discrepancy Evaluation Model: The model, based on system management theory, divides evaluation into five phases and four components. The four components are identifying the program standards, identifying the performance of the program, comparing the performance to the standards, and determining if there is a difference between the performance and the standards. Information regarding the differences is constantly made available to the program evaluators.

Stake's Countenance Framework: Developed by Stake, in this model, which is also called "Responsive Evaluation Model", attempts to decribe the thing being evaluated and render judgment about the thing's value or worth.

Expert Opinion Model: Developed by Eisner in 1975, this model emphasizes qualitative evaluation. Expert opinion model is comprised of three phases of description, interpretation, and evaluation.

Saylor, Alexander, and Lewis Model: This model emphasizes five components of evaluation. These are goals, subgoals and objectives, program of education as a totality, specific segments of the education program, and instruction and evaluation programs(Oliva, 1988).

Each of the models discussed above have different characteristics and adopts different approaches. By the help of program evaluation models, the programs can be evaluated effectively and their shortcomings and weaknesses can be overcome. In order to achieve this it is important that the characteristics of the models be recognized and the appropriate model be chosen. Research about the evaluation of the educational programs is common in literature. This research, however, mostly focuses on primary and secondary education programs and evaluates learning and teaching processes (Turan, 2004; Güler, 2004; Baykul ve Tertemiz, 2004, Yaşar ve Selvi, 1997, Yaşar, 1998). According to Yaşar (1998), research on higher education program evaluation is mostly in the form of single course evaluations in pre- and post-test format. Recently Başboğaoğlu (2004), Aksu (2004) and Şahinkayası (2004) conducted evaluation research on the basis of courses. Since Computer Education and Instructional Technologies Department was founded after the restructuring in 1997, the number of studies evaluating the programs in these departments is rather limited. This study aims to fill this gap by evaluating these programs based on the views of fourth-year students and students who graduated from the department.

PROBLEM

The research question for the study is "What are the views of the teachers and students regarding the level of necessity of the courses for the major and the applicability level of the knowledge learned in these courses for profession? More specifically, the following questions were addressed in the study:

1. What are the teachers and students' views on the necessity level of the courses in the Computer Education and Instructional Technologies Department?
2. What are the teachers and students' views on the applicability level of knowledge learned in courses in the Computer Education and Instructional Technologies Department?
3. Is there a significant difference between the necessity level and the applicability level of knowledge learned in these courses in the Computer Education and Instructional Technologies Department?

METHOD

This study is a descriptive research. The population of the study is faculty of educations which have CEIT Departments in Turkey. The sample of the study are fourth-year students in the Computer Education and Instructional Technologies Departments and former students of these departments who graduated and working as teachers in Turkey. The sample was randomly selected for the study.

Measurement Tool

For data collection a questionnaire was prepared. The questionnaire included the courses offered in the Computer Education and Instructional Technologies Department, and to elicit the necessity level of the courses for major a continuum with four intervals ranging from "very essential" to "not essential at all" was devised. Also, a second continuum with four intervals, regarding the applicabilityof the learned information in the courses was developed.

Data Collection and Analysis

The scales prepared were applicibility to elicit student responses by the researchers at the faculty of educations at five different departments. The graduated students who were teaching were reached via e-mail and they replied back through e-mails as well. The data obtained were analyzed by statistics program package. For analysis, mean scores and standard deviations were computed, and meaningul differences between variables were tested by t-test.

RESULTS

Current and graduated students' views on the necessity of the courses for the major and the applicibility of the knowledge learned in the courses in the departments of Computer Education and Instructioanl Technologies (CEIT) were elicited and the means for each course were calculated. The courses were grouped into six categories and their total scores were computed. These findings were presented in Table 1. and interpreted.

The Necessity Level of the Courses for the Major

For each course, the mean scores of the students' views on the necessity of the courses were obtained. Based on the scores, the location of each course within the groups, the importance levels within the groups, the location of the each course across all courses, and based on the scores of all the courses, the importance level of the each course was determined.

Course Name	Necessity level for the major					Applicability level of knowledge							
	N	X	Sd	level within the group	Rank of in all courses	N	X	Sd	level within the group	Rank of in all courses	X Difference	t	Ser. Der. P
Classroom Management	130	3,65	0,75	1	3	130	3,09	0,93	4	7	0,55	8,56	129,000
Scholl Experience II	129	3,63	0,87	2	4	129	3,22	1,06	2	2	0,4	5,83	128,000
Introduction to Teaching Profession	130	3,59	0,61	3	5	129	2,98	0,83	7	14	0,61	8,99	128,000
Development and Learning	130	3,55	0,76	4	10	130	3,15	0,91	3	4	0,4	6,62	129,000
Scholl Experience I	130	3,51	0,84	5	13	129	3,01	0,99	6	11	0,5	6,74	128,000
Instructional Pln. and Evl.	130	3,47	0,83	6	15	130	2,98	0,95	8	15	0,49	7,59	129,000
Teaching Practise	127	3,47	1,14	7	16	127	3,23	1,2	1	1	0,24	4,01	126,000
Instruc. Tech. and Mater. Development	130	3,42	0,82	8	17	130	3,05	0,9	5	10	0,37	5,4	129,000
Computer Edu. Teaching Methods I	130	3,21	0,87	9	22	130	2,81	0,97	9	19	0,4	6,32	129,000
Guidance	128	3,17	1,16	10	25	127	2,76	1,22	10	23	0,43	5,97	126,000
Computer Edu. Teaching Methods II	129	3,08	1,12	11	26	129	2,74	1,13	11	25	0,33	5,33	128,000
Pedagogical Knowledge	**127**	**3,44**	**,49**			**126**	**3,00**	**,63**			**,44**	**9,86**	**125,000**
Computer Networks and Communic.	129	3,71	0,65	1	1	129	3,11	1,02	3	6	0,6	7,28	128,000
App. of Auth. Language in Internet Env.	128	3,66	0,66	2	2	128	3,16	0,99	1	3	0,49	6,69	127,000
Programming Languages II	129	3,58	0,69	3	6	128	2,78	1,07	11	20	0,8	8,56	127,000
Information Techno. in Education II	129	3,57	0,73	4	7	129	3,05	0,97	5	9	0,52	6,3	128,000
Programming Languages I	129	3,56	0,75	5	8	129	2,78	1,11	10	21	0,78	8,83	128,000
App. of Auth. Languages in PC Env.	129	3,56	0,76	6	9	129	3,00	1,01	6	12	0,56	7,33	128,000
Use of Operating Systems	129	3,54	0,82	7	11	129	2,98	1,05	7	13	0,56	2,75	128,000
Information Technologies in Education I	129	3,54	0,77	8	12	129	3,07	0,95	4	8	0,47	6,2	128,000
Internet Applications in Education	129	3,48	0,99	9	14	129	3,13	1,1	2	5	0,35	5,1	128,000
Material Usage in Education	129	3,31	0,75	10	18	129	2,96	0,9	8	16	0,35	5,38	128,000
Foundation of Computer Aided Inst.	129	3,24	0,94	11	21	129	2,74	1	12	24	0,5	6,4	128,007

Instructional Design	129	3,21	1,05	12	23	129	2,78	1,15	9	22	0,43	5,6	128,000
Design, Development and Evaluation of Educational Software	129	3,21	1,18	13	24	128	2,71	1,22	13	26	0,49	6,28	127,000
Foundations of Distance Education	129	2,96	1,03	14	27	129	2,50	1,1	14	29	0,47	6,37	128,000
Information systems and Information systems application	**128**	**3,44**	**,53**			**126**	**2,99**	**,70**			**,44**	**9,86**	**125,000**
Calculus I	129	2,43	1,09	1	35	129	2,18	1,09	1	35	,25	3,44	128,001
Calculus II	129	2,30	1,00	2	37	129	2,05	1,00	2	37	,26	3,62	128,000
Physics I	129	1,99	,97	3	39	129	1,78	,91	3	39	,22	3,95	128,000
Physics II	129	1,93	,93	4	40	129	1,72	,86	4	40	,21	3,99	128,000
General Biyology	129	1,88	,92	5	41	129	1,67	,86	6	42	,21	3,49	128,001
General Chemistry I	129	1,85	,87	6	42	129	1,69	,85	5	41	,16	3,17	128,002
General Chemistry II	128	1,83	,87	7	43	128	1,65	,82	7	43	,18	3,35	127,001
Science and Mathematics	128	2,03	,82			128	1,82	,78			,21	4,23	127,000
Foreign Languages II	129	3,27	0,92	1	19	129	2,87	1,04	1	17	0,4	5,55	128,000
Foreign Languages I	128	3,26	0,96	2	20	128	2,85	1,02	2	18	0,41	6,24	127,000
Turkish II (Oral Expression)	129	2,85	0,99	3	28	129	2,66	1,09	3	27	0,19	3,38	128,001
Turkish I (Written Expression)	129	2,71	0,99	4	30	129	2,51	1,07	4	28	0,2	3,38	128,001
The Principles of Ataturk and The History of Turkish Revolution I	128	2,59	1,1	5	32	129	2,29	1,13	5	33	0,29	5,2	127,000
The Principles of Ataturk and The History of Turkish Revolution II	129	2,6	1,11	6	31	129	2,26	1,11	6	34	0,34	5,81	128,000
General knowledge	**127**	**2,88**	**,68**			**128**	**2,58**	**,73**			**,30**	**6,80**	**126,000**
Elective I	127	2,75	1,30	1	29	127	2,43	1,30	1	30	,32	5,37	126,000
Elective II	127	2,59	1,39	2	33	127	2,38	1,36	3	32	,21	4,00	126,000
Elective III	127	2,47	1,44	3	34	127	2,25	1,43	2	31	,22	4,12	126,000
Elective IV	127	2,35	1,55	4	36	127	2,16	1,50	4	36	,20	3,67	126,000
Elective V	125	2,25	1,57	5	38	125	2,04	1,51	5	38	,21	3,88	124,000
Elective Courses	**125**	**2,48**	**1,33**			**125**	**2,28**	**1,34**			**,20**	**3,65**	**124,000**

Table 1. The views of the students concerning the necessity of the courses for the major and the applicability of the knowledge learned in the courses for profession and t values for the differences between necessity and applicability scores.

As Table 1. shows, the pedagogy courses, and information systems and information systems application courses are viewed as the most essential courses for the major. The mean score for information systems and information systems application courses is 3.44. This score indicates that this group of courses are viewed as highly essential. Similiarly, pedagogy courses have a mean score of 3.44, which also shows that students view pedagogy courses as highly essential. With 2.88 mean score, general knowledge courses rate third in the essentiality list. It can be said that general knowledge courses are rated as essential at medium level. Elective courses, on the other hand, are viewed as moderately essential with a mean score of 2.48. The group of courses that scored the lowest in terms of essentiality is science and math group courses. The mean score for science and math courses is 2.03 which can be interpreted as low in terms of their necessity as viewed by students.

With regard to the essentiality of each course two rankings were devised. One shows the importance level of each class within the goup, and the other shows the ranking of the courses across all courses. In terms of necessity, within the group of pedagogy courses, classroom management ($x = 3.65$) has the highest score. Classroom mangement also ranks fourth among all courses. Courses with mean scores higher than 3.50 and viewed as essential for the major are as follows: School Experience II ($x = 3.63$), Introduction to Teaching Profession ($x = 3.59$), Development and Learning ($x = 3.55$), School Experience I ($x = 3.51$), Instructional Planning and Evaluation– Teaching Practice ($x = 3.47$), Instructional Technologies and Material Development ($x = 3.42$). The lowest mean score within the group is for Special Teaching Methods II ($x = 3.08$). In this group, the courses viewed as the least essential for the major are Computer Education Teaching Methods II ($x = 3.08$) and

Guidance courses. However, these two courses still have mean scores higher than 3.00. It can be said that these two courses are evaluated as essential at medium level.

Within information systems and information systems application education group most courses are viewed as highly essential. Computer Networks and Communications (x = 3.71), Applications of Authoring Languages in Internet Environment (x = 3.66) are the two courses with the highest score in terms of essentiality for the major. Within this group, the courses with the lowest score are Foundations Of Distance Education (x = 2.96), Design, Development & Evaluation of Educational Software (x = 3.21), and Instructional Design (x =3.21). Although these courses did not score high on the list, their mean scores show that their essentiality mean score is in the middle. Foundations of Distance Education course, however, with a mean score of 2.96, can be said to rate low on the essentiality.

Science and Mathematics courses group, on the other hand, has the lowest mean scores with Calculus I (x = 2.43) ve Calculus II (x = 2.30) with the highest means. The courses with the lowest means within this group are General Chemistry I (x = 1.85), General Chemistry II (x = 1.83) ve General Biology (x = 1.88), and it should be noted that these courses were thought to be not essential for the major. These three courses ranked also the lowest across all courses.

The Applicability of the Knowledge Learned in the Courses for the Profession

As can be seen in Table 1. pedagogy courses along with information systems and information systems application education rank the highest in terms of the applicability of the knowledge learned in these courses for the profession. Pedagogy courses have a mean score of 3.00, and their applicability can be considered to be moderate whereas information systems and information systems application education courses with a mean score of 2.99 are slightly below moderate applicability. The applicability of the general knowledge group courses is low with a mean score of 2.58. Elective courses, on the other hand, have a mean score of 2.28 and the applicability of these courses is rather low. Finally, science and math group courses with a mean score of 1.82 have the least applicability.

In terms of their applicability, the courses were ranked in two categories. The first ranking concerns how each course rates within the groups and the second ranking concerns the ranking of each course across all courses. Within Pedagogy courses, which have the highest applicability value as a group, Teaching Practice course ranks the highest with a mean score of (x = 3.23). This course also ranks the highest acroos all courses. Teaching practice is followed by School Experience II (x = 3.22), Development and Learning (x = 3.15) courses. The courses with the lowest pfofession applicability scores within this group are Computer Education Teaching Methods I (x = 2.81), Guidance (x = 2.76), Computer Education Teaching Methods II (x = 2.74). The rest of the courses rank moderately useful.

The group that followed Pedagogy Courses group in terms of its applicability is information systems and information systems application education. Within this group Applications of Authoring Languages in Internet Environment (x = 3.16) was found to be most useful. The rest of the courses within this group ranked as follows: Internet Applications in Education (x = 3.13), Computer Networks and Communication (x = 3.11), Information Technology in Education (x = 3.05). The least useful courses for the job are Foundations Of Distance Education (x = 2.50), Design, Development & Evaluation of Education (x = 2.71), Foundations Of Computer Aided Instruction (x = 2.74). The rest of the courses, except for the three least useful courses, rank somewhere in the middle or near the middle in terms of the utility of the information learned in these courses.

General knowledge group courses ranked third in terms of profession applicability. Of these courses, Foreign Language I (x = 2.85) and II (x = 2.87) were found to be the most useful. Principles of Kemal Atatürk and History of Revolutions I (x = 2.29) and II (x = 2.26) were the least useful for the profession. In terms of Elective Courses, Elective I (x = 2.43) and II (x = 2.38) had higher profession applicability scores than the rest of the elective courses and Elective IV (x = 2.16) and V (x = 2.04) were the least useful.

Science and Mathematics group courses had the lowest profession applicability score. In this group Maths I (x = 2.18) and II (x = 2.05) had the highest profession applicability scores and General Biology (x = 1.67), General Chemistry I (x = 1.69) and II (x = 1.65) had the lowest profession applicability scores. These courses were also found to be the least useful across all courses.

The Evaluation of the Learning Process in Courses

The learning process in courses was evaluated by assessing the difference between the necessity of the course for the major and the applicability of the knowledge learned in these courses for profession. Therefore, the difference between the mean scores for necessity for the major and the applicability for the profession was found by using t-test. The results showed that the biggest difference between the scores of necessity for the major and the applicability of the knowledge learned in the courses was in information systems and information systems application education. The difference in pedagogy courses was also rather high. In the courses within these two groups that were thought to be highly necessary for the majors the difference was remarkably high. Since these two groups were thought to be the most necessary for the major, it can be assumed that the activities involved in these courses were far from satisfying the expectations. In general, the difference in courses within science and math and elective courses was less because in these courses both profession applicability and necessity for the major levels were relatively low. Therefore, it can be said that the relatively high differences observed are more due to the high necessity scores of these courses than the level of profession applicability of the knowledge learned in these courses.

Significant differences on the basis of courses, on the other hand, can be interpreted as the inadequacy of the learning activities to satisfy learner expectations and the level of necessity of the learned knowledge to be significantly less than applicability for the major. When the courses are examined , the difference is especially remarkable for Introduction to Teaching Profession, Classroom Management, and School Practice I courses. These courses are viewed highly essential for the major; however, there may be certain problems in the teaching and learning process. The courses within the pedagogy group with the least significant difference are Teaching Practice and Computer Education Teaching Methods. In Information Technology and and Information Technology Education Application group, Programming Languages I and II courses also display significant differences indicating that knowledge learned in these courses is far from satisfying the expectations. In these courses too there seems to be problems in terms of teaching and learning processes. Also, it can be seen that in Computer Networking and Communication, Applications of Authoring Languages in PC Environment, and Applications of Authoring Languages in Internet Environment courses there are differences between the expectations and what has been learned in the courses. In this group the difference was relatively low in Internet Applications in Education and Material Use in Education classes.

In science and mathematics, general culture, and elective courses the difference was low and thus the expectations were realized to a certain extent; however, it can be said that this result was more due to the low applicability level of knowledge learned in these courses. The courses in these groups should be re-evaluated more in terms of their necessity for the major than the teaching-learning processes involved in these courses..

RESULTS

1. Pedagogy courses and information systems and information systems application courses are viewed as the most necessary course groups. Science and mathematics courses group is viewed as the least applicable.
2. In pedagogy courses group, in terms of necessity, “Classroom Management” ranks first and “Computer Education Teaching Methods II” ranks the last in the list.
3. Information systems and information systems application courses are viewed as highly essential . In this group “Computer Networking and Communication”,”Applications of Authoring Languages in Internet Environment”are the most necessary courses according to the subjects. These two courses are also considered as the most necessary courses among all courses. In this goup “The Foundations of Distance Education” has the lowest mean.
4. In science and mathematics group courses, Calculus I and II are thought to be the most and General Chemistry I and II and General Biology as the least essential course.
5. Knowledge learned in pedagogy and information systems and information systems application courses were viewed to be the most useful and science and mathematics courses as the least useful.
6. Of pedagogy courses, information learned in “Teaching Practice” was found to be the most useful for the profession and “Computer Education Teaching Methods II” and “Guidance” was considered as the least useful for the profession.
7. In information systems and information systems application courses “Applications of Authoring Languages in Internet Environment” had the highest level of applicability in terms of knowledge learned in these courses whereas “Foundations of Distance Education”, “Design, Development & Evaluation of Educational Software”, and “Fundations of Computer Aided Education” had the lowest necessity scores for the job.
8. Science and mathematics group courses were considered the least applicability for the profession, and of these courses, “Calculus I and II” were the most and “General Biology”, “General Chemistry I and II” were the least useful for the profession.

9. The group of courses with the biggest difference between necessity for the major and applicability for the profession was the information systems and information systems application courses, and there was also considerable difference between these two variables in pedagogy courses. The explanation for this finding can be that these two groups of courses were viewed as the most necessary for the major and the course activities did not meet the expectations of the learners adequately.
10. In science and math courses the necessity-applicability difference was low as a result of low scores on both necessity and applicability levels. Therefore, the issue with these courses is more about the level of necessity of these courses for the major than what the students learn in these courses.
11. In terms of necessity and profession applicability, in pedagogy courses group, "Introduction to Teaching Profession" and "Classroom Management", in information systems and information systems application courses group, "Programming Languages I and II" courses were found to display the biggest difference. This finding indicates that these courses are considered highly necessary for the profession; however, there are some problems in terms of the teaching-learning activities students are exposed to in these courses.

SUGGESTIONS

1. Science and mathematics courses should be restructured and based on expert view some of these courses should be eliminated and the most necessary ones should be determined.
2. Elective courses should be determined by taking learners' interests, needs, and expectaitions into consideration.
3. For the courses that are considered most necessary for the major yet less applicable for profession, the teaching-learning processes and course content should be re-evaluated and the course activities should be geared more towards developing the competencies of computer teaching skills.
4. In order to restructure Computer Education and Instructional Technology Programmes; school administrators, instructors, learners, academic staff, field experts, and private institutions should be involved in a needs assessment process.

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