Uzaktan Eğitim Sisteminde Sınav Hizmetleri ve Kitapların Dağıtımında Sağlanan Lojistik Destek ve Anadolu Üniversitesi Örneği*

Logistics Support Provided For Examination Services and Distribution of the Books in Distance Education Systems: The Case Of Anadolu University

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ÖZET

Bu araştırmanın amacı, uzaktan eğitim sisteminin sürdürülebilirliğinde, lojistik faaliyetlerin sağladığı desteğin önemini ortaya koymak ve bu lojistik destek kapsamında, öğrencilerin sınav hizmetleri ve kitap dağıtım hizmetlerine ilişkin tutumlarını değerlendirmek amacıyla yapılmıştır. Konuya örnek oluşturması için, sadece Türkiye'de değil dünyada mega üniversiteler arasına girmiş olan Anadolu Üniversitesi Uzaktan Eğitim Sistemi örnek olarak alınmıştır. Çalışmanın ilk kısmında, üniversitenin 1.084.000 öğrencisi ile yılda üç kez dört oturum olarak gerçekleştirdiği sınav organizasyonundaki dağıtım faaliyetleri ile aynı şekilde kitapların öğrencilere ulaştırılmasında sağlanan lojistik destek anlatılmaktadır. İkinci kısım ise anket çalışması ve elde edilen bulgulardan oluşmaktadır. Anket çalışmasında, öğrencilere ilişkin demografik bilgiler sunulduktan sonra sınav ve kitap dağıtım hizmetlerine ilişkin tutumlarının istatistiksel analizleri bulunmaktadır. Son kısım, mevcut duruma ilişkin değerlendirme ve anket sonucu elde edilen bulgulara dayanılarak oluşturulmuş sonuç kısmından oluşmaktadır.

Anahtar Kelimeler: Lojistik Destek, Dağıtım, Uzaktan Eğitim, Anket

Çalışmanın Türü: Araştırma

ABSTRACT

Although logistics is known to play an important role in many sectors, its place in educational systems has not been examined in detail yet. It is true that education and learning activities require large scale and effective organizations, and logistics play an important role in this organization. As for distance education programs, such a logistic support is crucial for the sustainability of the system due to the lack of face to face education and interaction.

When the system is evaluated in terms of logistics, multiple choice tests administered across the country are known to require a well-designed and effective logistic support. The exams in the system are administered three times a year in four sessions in 81 cities, 7213 buildings, 118.610 classrooms by 315.325 people officially assigned for this organization.

As for the distribution of exam documents across the country, 29 distribution routes are determined, twenty seven of which use land transportation and the other two a combination of land and air transportation. Some of the cities located on these routes are determined as "transfer centers". The exams for the students living in Western Europe are administered through the collaboration with educational consultancies and attachés located in six countries and twelve centers.

The course books are a significant component of the system and they are distributed via a well-organized system. In 2009-2010 academic year, a total of 5.5 million copies of 382 different course books were published. To ensure an effective distribution of these course books, a distribution plan are prepared in which outsourcing is used for shipping, and the shipping company follow the distribution route according to a predetermined time schedule.

The attitudes of students towards distribution services for exam documents and course books are one of the best criteria to assess the success of the system. Considering this situation, the researcher prepared a survey and administered it to 1359 students and the data obtained were analyzed statistically.

The survey is composed of two parts. The first part involves questions to obtain demographic data from the subjects and the second part the items to determine logistic service satisfaction level of the subjects.

Through the analyses of the findings from the survey, the relationship between demographic variables and exam documents and the points showing students' attitudes towards course books distribution services were searched.

The results of the survey show that the students enrolled in open and distance education system are generally satisfied with logistic support services and the system is ready for some possible changes and improvements.

Method: This section presents information about the survey administered to obtain data about attitudes of the students enrolled in distance education system towards logistic activities as well as the results of the survey. In other words, this questionnaire aims at gathering data about the students' attitudes towards the physical distribution of course books and logistic support provided during exam organization. The population of the study is the students enrolled in Anadolu University Open Education, Business Management and Economy Faculties. The survey developed were sent via e-mail to 2500 students, who were

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chosen through random sampling method and live in different parts of Turkey and are enrolled in Anadolu University distance education system in 2010-2011 academic year. Of these survey, 1493 were replied and sent back and 1359 survey were found suitable for the analysis and the purposes of the study. The first four questions in the scale obtain demographic data about the students and the next thirteen items were 5- point Likert type items.

The scale developed was piloted with 550 distance education system students during 2009 – 2010 academic year. Factor analysis was applied in order to determine factor loads of the items in the scale and to calculate the construct validity of the scale, which was developed so as to evaluate the logistic support service provided during exams and other printed materials in general. In order to test the reliability of the scale, Cronbach Alpha Coefficient was used and calculated as 0.91. The items with low factor loads and "item – total correlation" coefficient were excluded from the scale and a total of 13 items were determined. SPSS 16.0 package software was used for the analyses of the data obtained from the questionnaire.

Results: According to the data obtained, positive opinions about the system predominantly outweigh the negative ones. As for the positive ones, the students agree that they do not face any problems in accessing course books and the information about course books, and that the nylon pack covering the books is a good idea to keep all the course books packed together. No negative opinion is stated regarding exam services. The students agreed that exam calendar is strictly followed, exam documents are complete and exam information was always available on demand. Contended with exam services, the students stated that the people assigned for exams provided adequate information regarding exam procedures and regulations and the exams are administered in appropriate and safe conditions and exam papers are graded accurately and on time. Finally, the students are of the opinion that logistic support provided was adequate.

Two issues considered problematic are the physical conditions of bureaus located in the cities and the course book distribution process followed in these bureaus.

Conclusion: This survey study aims at exploring whether there is a relationship between demographic variables and attitude points regarding exam procedures and course book distribution services. The results showed that there is a significant relationship between attitude points regarding exam procedures and course book distribution services and demographic variables such as age, years of education, gender and the locations where students live in.

When age variable is examined, it is observed that the older the students, the higher the attitude points regarding exam and course book distribution services. Similarly, as for the years of education, attitude points regarding exam and course book distribution services increase as the years of education received increase. When gender variable and attitude points towards exam and course book distribution services are examined, it was found that female students had higher attitude points than males.

The relationship between the places the students live in and their attitude points towards exam and course book distribution services reveals that these points are lower in the cities where a large number of subject students live. The reason for this decrease is believed to be due to the problems faced during the times of registration and course book distributions in the bureaus that have to deal with greater number of students.

The type of the programs the students are enrolled was not found to have a significant effect on attitude points regarding exam and course book distribution services. In other words, whether the students are enrolled in undergraduate or graduate programs do not affect their attitudes towards exam and course book distribution services. The overall conclusion that might be obtained from this study is that the students attending Anadolu University distance education programs are generally satisfied with logistic support services and the system is ready for any possible changes and improvements.

The results of this study are expected to be a useful guide for the institutions operating in education and other fields. When the attempts by other Turkish universities to initiate distance education programs are considered, this current study is quite likely to provide useful information for these institutions.

Keywords: Logistics Support, Distribution, Distance Education, Survey

Type of Study: Research

1. INTRODUCTION

This study aims at highlighting the importance of logistic support for the sustainability of distance education systems as well as determining the attitudes of the students towards distribution process of exam documents and course books. For this purpose, Distance Education System of Anadolu University, one of the mega universities, was chosen as the population of the study. The first part of the study provides information about logistic support offered for the distribution of course books and the exam organization, which is carried out by Anadolu University three times a year in four sessions for a total of 1,084.000 students. The second part deals with questionnaire study and the findings obtained. This part presents demographic data about the students and the statistical analyses regarding the students' attitudes towards the distribution of the materials. Finally, the findings obtained from the questionnaires and the evaluations of the present situations are given

II. LITERATURE REVIEW

Distance education system has been the subject of many studies in the related literature and numerous articles, books and journals have been published accordingly. Despite the presence of many scientific publications about the different parameters of the systems (education, learning and technology), the

number of studies dealing with logistics, which plays an important role in the sustainability of the system, is quite low. The following are some of the studies available in the related literature

Petrosyan and Mkrttchian (2005), in their study focusing on the control problems in online distance education, conclude that logistic support has considerable positive effects on the process.

The working report published by World Bank (2005) on open and distance education program design for teacher training in Africa emphasizes the importance of logistic support in course material distribution and during traditionally administered exams.

In their study, Tenebe and Mundi (2008) develops a special strategy for open and distance learning for farmers and interagents. One of the important parameters of their study is the need to have logistic support for educational materials to be used in labor force training such as library, books, laboratories and tractor etc.

Rena (2007), in her study, introduces distance education programs in Eritrea and states that logistic support is a significant factor in effective distance education.

The questionnaire study carried out by Patrick and Hawkins (2001) reveals that logistic support is essential for all types of organizations in distance education programs.

Similarly, Frieden (1999), in her article, highlights the importance of "logistics" in support services in distance education.

In his book about the student support activities in open and distance education, Simpson (2002) focuses on logistic support provided for the students through various channels such as media, communication via telephone and other similar ways.

Valeta and Therriault (2001) examine the attitudes of students towards distance education and learning styles. They state that students have provided negative opinions regarding logistic support and therefore the access to course materials from administrative and technical point of view.

Finally, Rekkedal, Dye and Fagerberg (2005) emphasize the importance of logistic support in solution finding and mobile learning in the context of distance education.

III. THE BENEFITS OF LOGISTICS EDUCATIONAL PROCESSES

History of the logistics is as old as humanity. While the logistics support activities performed by primitive people have changed in terms of formal aspects through the opportunities provided by technology, it is possible to observe successful logistics application examples, which are even difficult to perform today, in the periods with a much lower level of technological advancement than today.

Today, the most acceptable definition of the logistics is made by Council of Supply Chain Management Professionals (CSCMP). According to this definition, logistics *is the process of planning, implementing, and controlling procedures for the efficient and effective transportation and storage of goods including services and related information from the point of origin to the point of consumption for the purpose of conforming to consumer requirements*. A well-managed logistics system aims to *provide correct product for the correct consumer in correct quantity, under correct conditions, in correct place, in correct time and at correct price*. (http://www.cscmp.org/Downloads/Resources/glossary03.pdf)

Although logistics is known to play an important role in many sectors, its place in educational systems has not been examined in detail yet. It is true that education and learning activities require large scale and effective organizations, and logistics play an important role in this organization. As for distance education programs, such a logistic support is crucial for the sustainability of the system due to the lack of face to face education and interaction.

As in many other fields, the people involved in the field of education have been making use of technology more often and more intensely. However, effective and efficient use of technology requires an optimum level for software and network infrastructure, economic conditions and the number of users. Therefore, although most of the services are provided through technology in distance education system, all the exam services and technology use for supplementing educational materials might be insufficient due to the presence of millions of students enrolled in the system. Unfortunately, the high number of students in Anadolu University Distance Education System and the provision of broad range of services restrict the use of technology in the system, and therefore the testing services and printed material supplementation

are carried out through physical shipping services until necessary technological equipment and network infrastructure are established.

When the system is evaluated in terms of logistics, multiple choice tests administered across the country are known to require a well-designed and effective logistic support. The exams in the system are administered three times a year in four sessions in 81 cities, 7213 buildings, 118.610 classrooms by 315.325 people officially assigned for this organization.

The main reason for the success of testing service in the system for long years is the invaluable support received from other universities and a careful and well-planned exam organization. In order to administer the exams all across the country with the help of ten thousands of invigilators in hundred thousands of classrooms, the correct boxes containing the exam materials should be delivered to and recollected from correct buildings. Logistic support plays an important role in carrying out this service perfectly.

When the role of logistics in the field of education is considered, the most important function is the provision of a wide variety of services and information flow in correct places and time and under suitable conditions and by paying a reasonable price.

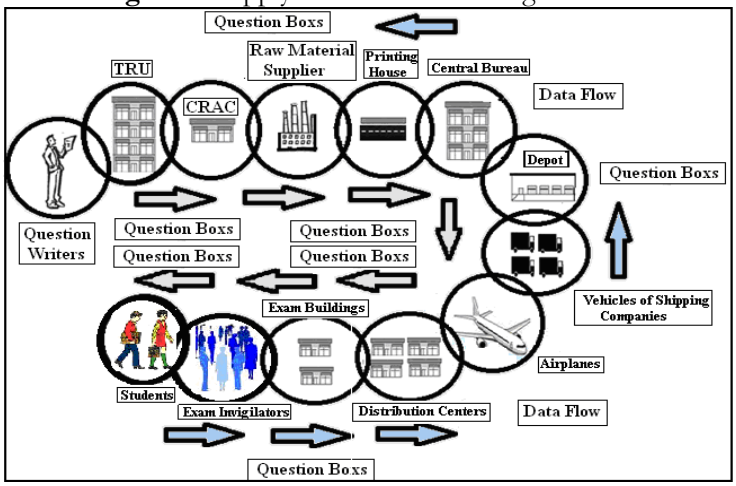
IV. LOGISTICS SUPPORT PROVIDED FOR EXAM ORGANIZATION

One of the most influential factors ensuring the sustainability of distance education systems is the increase in the quality of the services provided for students and the consistency in this quality. Anadolu University is continuously increasing its service quality and the number of students enrolled in distance education system in three main faculties: Open Education Faculty, Faculty of Business Administration and the Faculty of Economics. Having a significant role in the sustainability of the system, exams are administered on time according to the syllabi through a well-designed organization. These exams are held three times a year in four sessions at the weekends in 81 cities, 7213 buildings, 118 610 classrooms across Turkey in collaboration with 315.325 people having different duties in the organization.

A total of 280 different question booklets used for distance education system pass through a supply chain until they are delivered to the students.

The elements of this supply chain are as follows**:** Question writers, raw material supplier, Anadolu University Printing House, Open Education Faculty Central Bureau, CRAS store, Vehicles of shipping companies, Airplanes, Distribution Centers, Buildings where exams are administered and the people assigned as the responsible bodies in these buildings, classrooms, invigilators and students. (Figure 1)

Figure 1. Supply Chain for Exam Organization



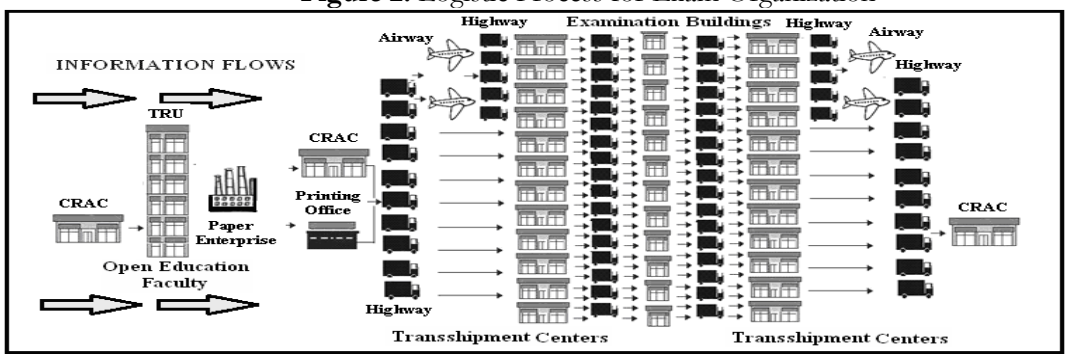
Delivery system deals with the dispatch of question booklets to predetermined points and the recollection of these documents from these points. The main aim of this system is to find the best route for the vehicle to follow as the shortest way by spending the least possible time (Ballou, 1999: 19-23).

The integration of semester-based credit system as of 2012-2013 academic year is likely to increase these distribution practices. Such a change in the system will require a revision in course book distribution process. The current study aims at evaluating how logistics practices have been carried out for years until now, in other words, it examines the current situation before the implementation of the new revisions.

Since exams are important components of the system, a large scale organization is required to ensure reliability and order. There is a long process until the students are given exam booklet in exam halls. Logistic support plays an important role for the success of this process.

The contribution of logistic support to the system is shown in Figure 2. Displaying the roles of logistic support visually in steps in Figure 2 will make it easy to understand these roles.

Figure 2. Logistic Process for Exam Organization



Anadolu University Computer Research and Application Center (CRAC) determines the scope of the question booklets in terms of courses, and the sequence of the questions according to courses, and then sends them to the Test Research Unit (TRU) as a booklet.

TRU asks the subject area specialists who are working there to write questions or take questions from subject area experts working in other faculties. Then the questions are processed in magnetic environment and they become ready for checking. (http://www.anadolu.edu.tr/aos/aos_tanitim/sinav_hiz.aspx)

After these processes, various statistical transcriptions of the program are prepared. These statistics show information such as the number of booklets to be printed for each booklet type, the number of booklets each package will include, the number of books per class, and it also shows how to organize the exam papers. This statistical and organizational data includes information about labels, lists, official reports, and test papers for the exam and ensures proper functioning of the process. (http://www.anadolu.edu.tr/en/aos/aos_tanitim/sinav_hiz.aspx)

Inventories also help the authorities to determine the amount of paper to be used for publishing purposes. Then, required amount of paper is purchased from paper companies accordingly.

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Some of documents are prepared for delivering to the coordinators in each city and others for students and other people assigned for various duties in the organization. Outsourcing is one of the methods used during distribution organization and bids are issued to determine the most appropriate shipping company. This company is required to assume responsibility to realize dispatching organization in the best way according to predetermined specifications. The dispatch route plan is prepared by CRAC and the company entitled for dispatch has the responsibility to apply the dispatch plan accordingly.

As for the distribution of exam documents across the country, 29 distribution routes are determined, twenty seven of which use land transportation and the other two a combination of land and air transportation. Some of the cities located on these routes are determined as "transfer centers".

In addition, the vehicles to be used for shipping are required to have the following features: a steel safe and a vehicle body appropriate for locking and sealing as well being a model produced after 2007

Exam documents and optical answer forms prepared in Computer Research and Application Center and exam booklets printed in printing house are packed together in locked boxes in CRAC. The boxes are later piled according to dispatch plan so they will be shipped in different times and days depending on the distance to be traveled. Time table includes the following information:

- the dates when vehicles should be ready in Eskişehir for loading
- departure times
- returning times

When above mentioned procedures are completed, the documents to be used in the exam to be held in 81 different cities and 7213 buildings across Turkey are ready for dispatch with vehicles in different days. According to the protocol signed with Ministry of Internal Affairs, police forces support the process to ensure a problem-free organization during all the phases of the exam administration.

The starting point is the same for all vehicles. Later, they follow 29 dispatch routes and 11 related subroutes. For the 28th and 29th routes, the vehicles go to Ankara Esenboğa Airport and then the materials are delivered to 7 transfer centers via airplanes and finally the materials are transferred to 10 dispatch subcenters by land vehicles. (Figure 3: 27 Dispatch Routes for Land Shipping) (Figure 4. Land-Air-Land Combination Shipping – 28th and 29th Dispatch Routes)

Figure 3. 27 Dispatch Routes for Land Shipping during Exam Organization

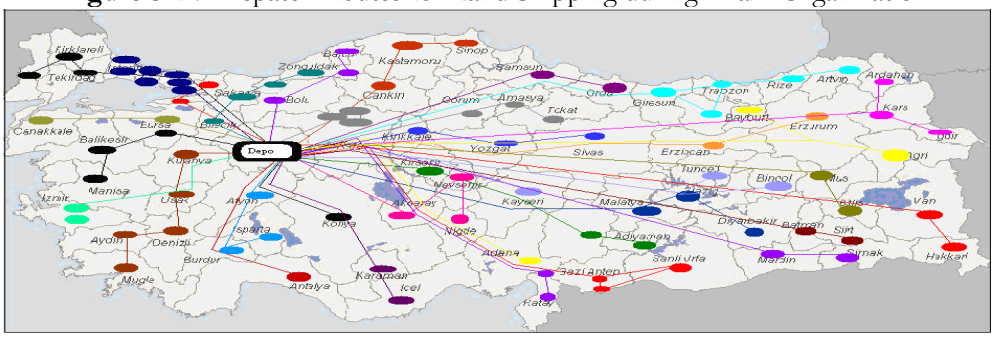
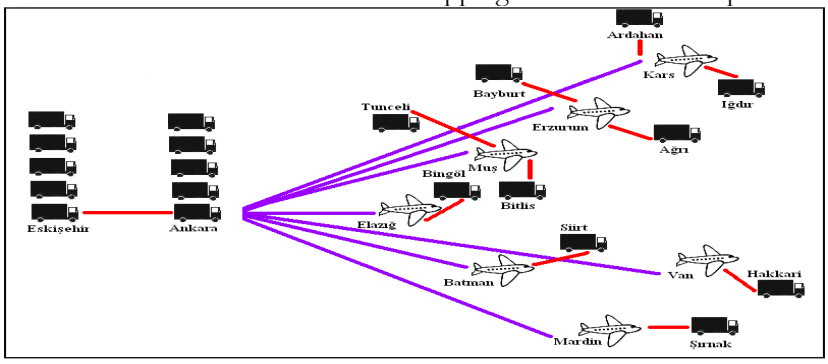


Figure 4. Land-Air-Land Combination Shipping – 28th and 29th Dispatch Routes



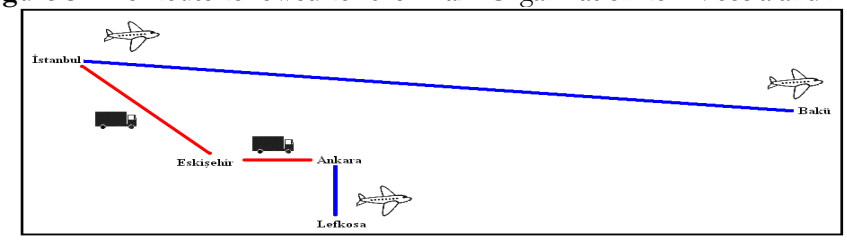
The boxes are kept in the transfer centers located in certain cities and distributed to the buildings on exam days and later returned to these centers after the exam.

The boxes are returned to transfer centers after the exams, and later they are dispatched to CRAC following the predetermined routes. The boxes submitted to CRAC are kept in the repository until they are graded by computers.

The dispatch organization to Turkish Republic of Northern Cyprus is very similar to 28th and 29th dispatch routes. In other words, the trucks go to Ankara Esenboğa Airport and then the materials are sent to TRNC via air transportation and finally the materials are transferred to Nicosia by trucks or similar vehicles.

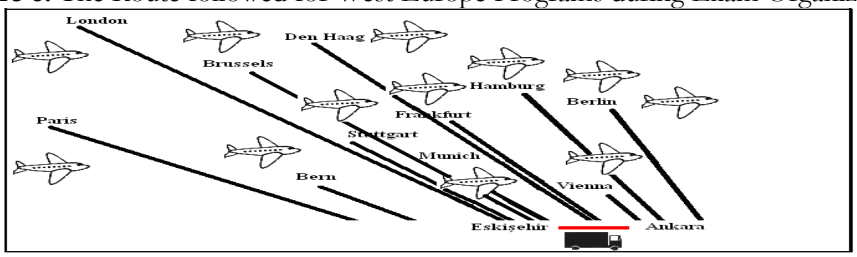
Academic staff assigned for exam organization in Azerbaijan takes the boxes together with them to Baku. Firstly, they go to Istanbul by buses or similar vehicles and then fly to Baku. Finally, the boxes are taken to exam buildings in Baku by the academic staff from Anadolu University (Figure 5)

Figure 5. The Route followed for the Exam Organization for Nicosia and Baku



The exams for Turkish people living in Western European Countries are administered in 12 exam centers located in 6 countries across Europe in collaboration with corresponding educational consultancy departments and attachés located in these countries. The locations of these centers are as follows: Köln, Stuttgart, Hamburg, Munich, and Berlin in Germany, Paris in France, Vienna in Austria, Bern in Switzerland, Brussels in Belgium Lahey (Den Haag) in Netherlands and London in United Kingdom. According to dispatch plan for these exams, the boxes are taken to the Ministry of Transportation in Ankara and later are dispatched to educational attachés in these countries via air mail as special diplomatic cargo. The exams are administered in education attaches (Figure 6)

Figure 6. The Route followed for West Europe Programs during Exam Organization



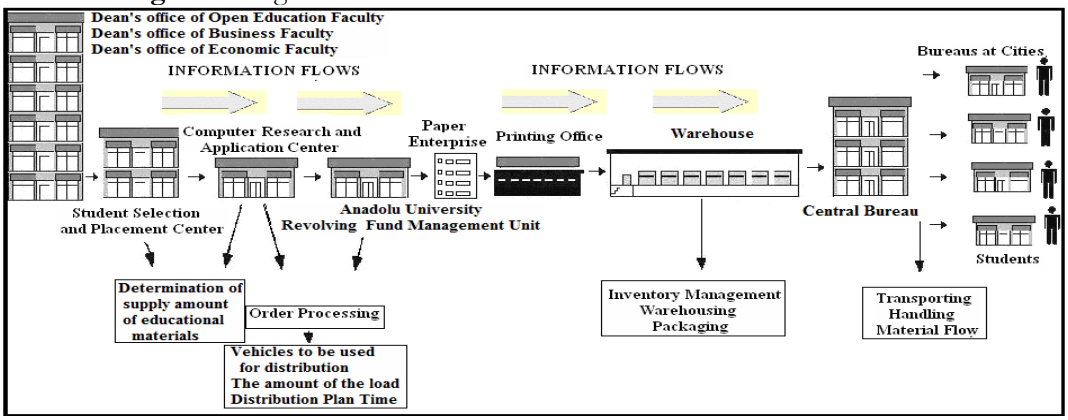
Following the administration of the exams, the boxes are returned to the transfer centers, and later these boxes are submitted to Computer Research and Application Center

V. LOGISTICS SUPPORT DURING THE PROVISION OF EDUCATIONAL MATERIALS TO THE STUDENTS

Logistic support plays an important role during the whole process of printing and delivering course books – the most important educational materials supplementing Anadolu University Distance Education System. To illustrate with, a total of 5.5 million course books copies of 382 different course books were printed during 2009 – 2010 academic year.

The organization of such a large scale printing and delivery process that involves information flow, supply, transporting and storage is carried out successfully for years thanks to a well-organized strategic management both within the institution and throughout the distribution channels. This process is displayed step by step in Figure 7.

Figure 7. Logistic Process for the Distribution of Educational Materials



The data about the number of students obtaining the right to be enrolled in university departments for the academic year is obtained from Student Selection and Placement Center

In order to prepare the "distribution plan", detailed data about students including the cities they live in, departments, classes and Open Education Faculty bureaus they applied across Turkey are obtained from Anadolu University CRAC. The collection of such information helps authorities to determine the supply amount of educational materials to be delivered for logistics purposes.

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The final version of distribution plan regarding the provision of educational materials for students through Open Education Faculty bureaus located across Turkey is submitted to Anadolu University Revolving Fund Management Unit. The information flow in the steps, which is necessary for the realization of logistic operations, is realized with the help of information technologies. The information regarding the materials, the vehicles to be used for distribution, the amount of the load, the routes to be used for distribution and timing is determined by CRAC. The above mentioned operations can be matched with "order processing" in terms of logistics.

Course books are printed in the printing house according to the data obtained from this information flow. The materials printed are taken to the warehouse As for logistic operations, storage is considered a fundamental process, so there are some necessary specifications determined for warehouse. "Anadolu University Book Warehouse" has shelves designed to avoid confusion by taking into consideration certain risk factors such as heat, humidity and light. The warehouse also enables a quick removal of the materials in case of fire and natural disasters. The function of the warehouse is to classify educational materials orderly and to store them until they are needed.

Prior to storage, course books should be packed and labeled according to the departments and courses. As for packaging purposes, plastic materials, that are transparent nylon bags, are used. The reason for preferring plastic materials is that they can be recycled, light, durable, easy to shape and resistant to gases. Labels provide information about the courses and the programs for each package of books.

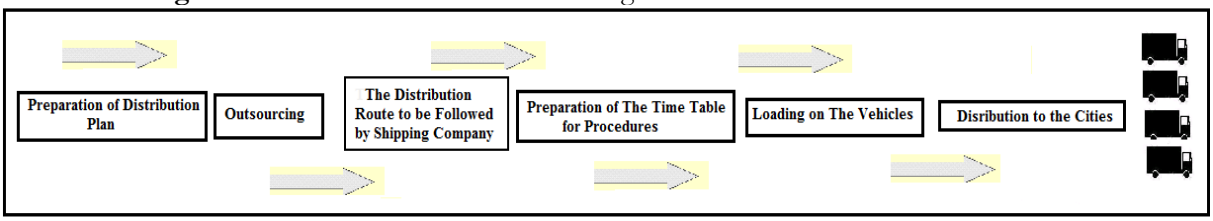
Warehousing method, which is one of the important parts of supply chain, is now a separate area of expertise and an indispensable operation in logistics. The recording of materials in a computer database is realized through a barcode system as a part of warehousing management, which is an often used method during logistic operations. The aim of this recording is to access certain information such as the amount or the location of the materials whenever needed.

The course books recorded in the database are piled according to the classes and courses with the help of handling tools that are often used in logistic operations Among these handling tools are pallets (to carry many boxes and bundles in large amounts), conveyor belts (close-circuit continuous carriage mechanism for the loads) and forklifts (a tool used for storing).

All kinds of information students need are printed in a guide book prepared by Central Bureau and sent to the students via snail mail.

The following procedures are initiated in order to dispatch the course books packed in the warehouse to 91 DES bureaus located in 81 cities across Turkey,: (Figure 8)

Figure 8. The Procedures followed during Distribution of the Course Books



Procedure 1: Preparation of Distribution Plan: It is prepared by CRAC on the basis of previous years' statistics. This plan is supposed to be completed by February.

Procedure 2: Outsourcing: Outsourcing during logistic operations facilitates the operations. It is quite common to apply outsourcing for shipping during distribution process. Anadolu University issues a bid to determine the company to carry out the distribution.

The company entitled to do the shipping is given the information about the number of the course books to be distributed and is supply to make a plan for 20% more course books than the adequate amount in case of some problems that might occur during distribution to *students*.

Procedure 3. The Distribution Route to be followed by Shipping Company: The specifications prepared for the shipping company includes information about the number of DES bureaus in the cities, the cities located on the predetermined routes as well as the route map prepared according to the amount of the load to be distributed

Procedure 4. Preparation of the Time Table for Procedures: Within the framework of distribution plan prepared for shipping company, time table is necessary to enable data transfer to the related units whenever needed;

- the determination of shipping method
- distribution and operation management
- time planning
- determination of the load to be distributed

Procedure 5. Loading on the Vehicles: The basic component of educational material distribution organization is the flexibility of shipping method. Generally, land shipping is preferred by the company to ensure "door-to-door" distribution. (Çekerol, 2010).

Procedure 6. Distribution to the Cities: The course books loaded on vehicles are distributed to 91 Open Education Faculty bureaus located in 81 cities across Turkey

When books are delivered to bureaus, the available stocks are counted in April so that the data about the number of extra books, if there are, is obtained. In order to collect these extra books from Open Education Faculty bureaus a new bid is issued for outsourcing. The entitled company collects these extra books from the offices and returns them to the central warehouse located in Eskişehir.

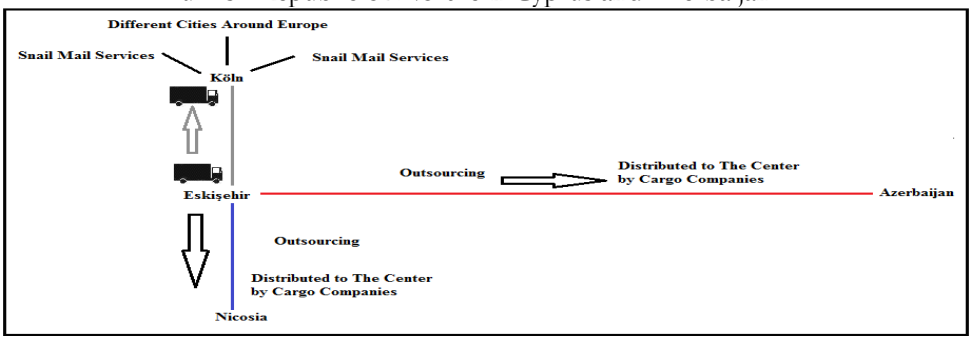
The course books returned to the central repository are stored here as new sets. Unusable ones are recycled, which is an operation of reverse logistic network

As for the distribution plan for the educational materials to be provided for the students enrolled in West Europe Programs of Anadolu University Open Education Faculty, such materials prepared according to the needs of these students are sent to the bureau located in Köln, Germany through land shipping vehicles. The bureau in Köln is the distribution center from which the materials are sent to the students living in different cities around Europe via snail mail services

The distribution center for Turkish Republic of Northern Cyprus is Nicosia. The educational materials are delivered to the center by cargo companies as an outcome of outsourcing process (Figure 9).

Baku is the distribution center for Azerbaijan. Just like the procedure followed for Turkish Republic of Nicosia Cyprus, the educational materials are distributed to the center by cargo companies as an outcome of outsourcing process (Figure 9).

Figure 9. Logistic Support provided for the Distribution of Educational Materials to West Europe, Turkish Republic of Northern Cyprus and Azerbaijan



VI. The Attitudes of Students towards Logistic Practices

This section presents the findings of a survey designed to obtain the attitudes of the students enrolled in Anadolu University Distance Education System towards the logistic support provided. This study examines the attitudes towards logistic support provided during exam organization and the physical distribution of course books.

VII. MATERIALS AND METHODS

This section presents information about the questionnaire administered to obtain data about attitudes of the students enrolled in distance education system towards logistic activities as well as the results of the questionnaire. In other words, this questionnaire aims at gathering data about the students' attitudes towards the physical distribution of course books and logistic support provided during exam organization. The population of the study is the students enrolled in Anadolu University Open Education, Business Management and Economy Faculties.

The questionnaire developed were sent via e-mail to 2500 students, who were chosen through random sampling method and live in different parts of Turkey and are enrolled in Anadolu University distance education system in 2010-2011 academic year. Of these questionnaires, 1493 were replied and sent back and 1359 questionnaire were found suitable for the analysis and the purposes of the study. The first four questions in the scale obtain demographic data about the students and the next thirteen items were 5-point Likert type items.

The survey designed for the study consists of 20 items. Five-point Likert scale was used for analysis purposes, in which 1 refers to "I don't agree at all", 2 "I don't agree", 3 "Undecided", 4 "I agree" and 5 "I totally agree".

The scale developed was piloted with 550 distance education system students during 2009 – 2010 academic year. Factor analysis was applied in order to determine factor loads of the items in the scale and to calculate the construct validity of the scale, which was developed so as to evaluate the logistic support service provided during exams and other printed materials in general. In order to test the reliability of the scale, Cronbach Alpha Coefficient was used and calculated as 0.91. The items with low factor loads and "item – total correlation" coefficient were excluded from the scale and a total of 13 items were determined. SPSS 16.0 package software was used for the analyses of the data obtained from the questionnaire.

5.2 Frequency Distribution of the Students Who Replied the Survey and the Findings

The study examines the numerical distribution of demographic information of the participants (Table 1). According to the data regarding the "age" variable, the following results were obtained: 862 (63.42 %) between 18 and 25; 321 (23.62 %) between 26 and 35; 125 (9.19 %) between 36; and 50, 51 (3.75 %) over 50 (Table 1). Similarly, 212 students (%15,6) attend 1st year; 305 (%22,44) 2nd year; 311 (%22,88) 3rd year,

531 (% 39,07) 4th year (Table 1). In addition, 825 (60.7%) out of 1359 students are female and 534 (39.29 %) male. Finally, 112 students are enrolled in (8.24) Two-year programs and 1247 (91.75 %) in undergraduate programs (Table 1).

The data about the regions where the participants live reveals the following distribution: 121 students (8.9 %) from Middle Anatolia Region, 451 (33.2 %) Marmara Region, 182 (13,4%) Aegean Region, 119 (8,7%) Black Sea Region, 92 (6,8%) Mediterranean Region, 302 (22,2%) East Anatolia Region and 92 (6,8%) South East Anatolia. These students receive services from the bureaus in the cities they live (Table 1)

Table 1. General Demographic Information of the Subjects

Age	**Frequency**	**%**
18-25	862	% 63,4
26-35	321	% 23,6
36-50	125	% 9,3
50 +	51	% 3,7
Class Level		
1. class	212	% 15,6
2. class	305	% 22,4
3. class	311	% 22,9
4. class	531	% 39,1
Gender		
Female	825	% 60,7
Male	534	% 39,3
Program Types		
Two-year degree	112	% 8,2
Undergraduate	1247	% 91,8
Regions		
Middle Anatolia Region	121	% 8,9
Marmara Region	451	% 33,2
Aegean Region	182	% 13,4
Black Sea Region	119	% 8,7
Mediterranean Region	92	% 6,8
East Anatolia Region	302	% 22,2
South East Anatolia.	92	% 6,8

In the study, "questionnaire" was used as the data collection instrument since it is the most appropriate tool to ensure objective and statistical analysis of the data, and the research method is descriptive and relative. The following results were obtained according to the data analysis: (Table 2)

Table 2. The Items in the Survey and the Results Obtained

Attitudes	**Strongly disagree**	**Disagree**	**Neither agree nor disagree**	**Agree**	**Strongly agree**	$\overline{X}$
	n **%**	**n** **%**	**n** **%**	**n** **%**	**n** **%**	
The course books are easily available in the Open Education Local Bureaus	3 %0,2	10 %0,7	108 %7	205 %15	1033 %76	4,66
Information provision regarding course book distribution and other services is sufficient.	89 %6	13 %1	113 %8	741 %55	403 %30	4,05
Open Education Faculty local bureaus have sufficient physical conditions to ensure course book distribution and the provision of other student services.	101 %7	209 %15	392 %29	452 %33	205 %15	2,67
Preparing the set of course books by using nylon makes it easier to carry them and prevents them from possible damage.	17 %1	54 %4	203 %15	780 %57	305 %22	3,96
Course book distribution process is carried out conveniently during registration days.	105 %8	478 %35	402 %29	296 %22	78 %6	2,83
Exams are administered on predetermined days and hours on time	3 %0,2	5 %0,3	9 %0,6	79 %6	1263 %93	4,91
Question booklets and answer sheets are always available without any problems during the exams.	4 %0,2	14 %1	17 %1	21 %2	1303 %96	4,92
It is always very easy to access information about exams	19 %1	29 %2	33 %2	216 %15	1062 %78	4,67
All the services related to exams are quite satisfactory.	27 %2	31 %2	45 %3	348 %26	908 %67	4,53
The people who are responsible in the exams provide sufficient information during the exam.	45 %3	48 %3	53 %4	578 %42	635 %47	4,26
As for the exam process, exam materials are dispatched to the places in time where they will be graded.	6 %0,4	21 %1	197 %15	295 %22	840 %62	4,43
Exams are administered in a secure environment.	12 %1	43 %3	65 %4	368 %27	871 % 65	4,02
In distance education system, the logistic support provided for course book distribution and exam services is sufficient.	14 %1	21 %1	79 %6	789 %58	456 %33	4,22

According to the replies given to Likert Type statements;

- Of the subjects replying the survey, 91 % state that they can access the course books in the bureaus whenever they wish to ($\overline{X}$=4.66). This result clearly shows that there is no problem with the physical distribution of the course books.
- 85 % of the participants agree with the statement that sufficient support is provided regarding the distribution of course books and other students services ($\overline{X}$=4.05). From this data, it can be concluded that no problem is observed in the information flow.
- Only 48 % of the students believe that the bureaus have sufficient physical conditions in terms of course book distribution and other student services ($\overline{X}$=2.67), which signifies a certain extent of problems during the process.
- Of the participants, 79 % agree that preparing the set of course books by using nylon makes it easier to carry them and prevent them from possible damage ($\overline{X}$=3.96). This result reveals that the correct materials are used for packaging purposes when logistic dimension is concerned.

- 28 % of the students think that course book distribution practice is carried out easily without any problems ($\overline{X}$=2.83). This result clearly shows that there is a problem regarding the services provided for the students during certain times because the number of students is quite high during these times.
- 99 % of the participants agree that exams are administered on the predetermined days and hours on time ($\overline{X}$ = 4.91). It is clear that exam organization is realized according to the time table.
- Similarly, 98 % of the subjects agree that question booklets and answer sheets are readily available in the exams without any problems ($\overline{X}$=4.92). This clearly shows that no problem is observed regarding the physical distribution of exam documents.
- 93 % of the participants state that they can easily access information regarding exams ($\overline{X}$ = 4.67), which signifies no problem about the information flow regarding exam organization.
- 93 % of the students who replied the survey find exam services quite satisfactory ($\overline{X}$=4.53), which shows no problem about the supply chain in exam organization.
- 89 % of the participants are of the opinion that those who are responsible in the exams provide sufficient information during the exams ($\overline{X}$ = 4.26). We can conclude that exam responsible have enough information regarding exams and provide satisfactory support to the students when needed.
- Of the participants of the study, 84 % think that exam documents will be recollected to the place where they will be graded in time ($\overline{X}$=4.43). In other words the process of recollection of exam materials by the exam center is free from problems.
- 92 % of the students participating in the study agree that exams are administered in a safe environment ($\overline{X}$ = 4.02), which shows that exams are carried out in a safe environment in terms of physical conditions and the exam responsible.

Finally, 91 of the participants are of the opinion that logistic support in distance education system is satisfactory ($\overline{X}$=4.22). This item and all the other items in the survey show that system work free of problems in terms of logistic support according to the participants. According to normality test, T-test and One-Way ANOVA parametric tests were used in independent groups for the data showing normal distribution and Kruskal Wallis H and Mann Whitney U nonparametric tests for the data not showing normal distribution. The signifinance level was taken as 0.05.

Table 3. The Multi Comparison Of The Attitudes Of The Participants Towards Exam Services And Course Book Distribution Services In Terms Of Age Groups.

(I) Age	(J) Age	Mean Difference (I-J)	Standard Error	P
18–25	26–35	0,31	0,15	0,092
	36–50	-0,11	0,09	0,078
	over age 50	-0,40	0,12	0,083
26–35	18–25	-0,31	0,15	0,092
	36–50	-0,42	0,24	0,121
	over age 50	-0,71	0,27	0,189
36–50	18–25	0,11	0,09	0,078
	26–35	0,42	0,24	0,121
	over age 50	-0,29	0,03	0,019*
over age 50	18–25	0,41	0,12	0,083
	26–35	0,71	0,27	0,189
	36–50	0,29	0,03	0,019*

Table 3 presents the multi comparison of the attitudes of the participants towards exam services and course book distribution services in terms of age groups. According to the results obtained, attitude points of the participants over 50 years of age towards exam services and course book distribution services were

found to be significantly higher than those of the participants between 36 and 50 years of age (P<0.05). No significant differences were found among other age groups (P<0.05).

Table 4. The Comparison of the Attitudes of the Participants towards Exam Services and Course Book Distribution Services in terms of Years of Education

	Class Levels	N	Means	Std. Deviation	t	P
Attitudes	1. sınıf	212	3,69	0,33	0,367	0,000
	2. sınıf	305	3,99	0,31		
	3. sınıf	311	4,28	0,27		
	4. sınıf	531	4,47	0,23		

*P<0,05

When Table 4 is examined, the results reveal a meaningful relationship among attitude points of participants regarding exam services and course book distribution services according to years of education (t=0,367; P=0,000; P<0,05). In other words, attitude points increase as the years of education increases.

Table 5. The Comparison of the Attitudes of the Participants towards Exam Services and Course Book Distribution Services in terms of "Gender" Variable

	Gender	N	Means	Std. Deviation	t	P
Attitudes	Bayan	825	4,45	0,38	0,421	0,02
	Erkek	534	3,75	0,46		

It has been found that there is a statistically meaningful relationship between attitude points regarding exam services and course book distribution and the gender variable (t=0,421; P=0,02; P<0,05). (Table 5)

Table 6. The Comparison of the Attitudes of the Participants towards Exam Services and Course Book Distribution Services in terms of Program Type

	Program Types	N	Means	Std. Deviation	t	P
Attitudes	Two-year degree	112	4,25	0,56	0,454	0,71
	Undergraduate	1247	4,36	0,51		

According to the analysis of the data, no meaningful relationship was found between attitude points regarding exam services and course book distribution and the program types they are enrolled (t=0,454; P=0,71; P>0,05). (Table 6)

Table 7. The Comparison of the Attitudes of the Participants towards Exam Services and Course Book Distribution Services according to the Places Where Participants Live

	The place where students live	N	Means	Std. Deviation	t	P
Attitudes	Middle Anatolia Region	121	4,01	0,47	0,351	0,003
	Marmara Region	451	2,86	0,59		
	Aegean Region	182	3,83	0,53		
	Black Sea Region	119	4,51	0,34		
	Mediterranean Region	92	4,08	0,46		
	East Anatolia Region	302	4,78	0,21		
	South East Anatolia.	92	4,65	0,29		

According to the analysis of the data, a meaningful relationship was found between attitude points regarding exam services and course book distribution and the place where students live (t=0,351; P=0,003; P>0,05). (Table 7) When this result is examined, it was found that there is a tendency for attitude points to decrease in the cities where the number of students is considerably high (Table 8).

Table 8. The Number of Students in the faculty of Distance Education, Faculty of Economics and Faculty of Business Administration and Attitude Points

Cities	Number of Students	Attitude Points
İstanbul	427.507	2,08
Ankara	159.334	2,87
İzmir	107.884	3,12
Bursa	61.334	3,21
Antalya	48.681	3,96
Adana	44.219	3,82
Eskişehir	41.244	4,48
Kocaeli	38.786	3,99
Konya	33.717	4,45
Kayseri	26.569	4,39

Conclusion

In today's world, the presentation of education differs according to countries depending on the use of information and communication technologies, differences in regulations, the demands and the number of the learners. Distance Education System at Anadolu University has been offering education opportunities to large masses in Turkey for 29 years. The most outstanding success of the system is the organization power which extends across Turkey and even some places abroad. It is true that logistic plays a significant role in the success of the system in all phases.

The system makes use of information technologies for the printing of books and exam booklets and also for their storage. The latest developments and innovations are searched and applied when necessary.

However, Anadolu University distance education system will implement semester-based credit system as of 2012-2013 academic year, which requires reorganization of many activities. To ensure a successful implementation, it is necessary to analyze the existing system and determine the activities and practices to be revised.

The high number of students in the system is a restricting variable for large scale changes in the organization. However, the necessity to adapt to new situations requires questioning the system to ensure sustainability. Although no serious problems are observed in organization, the distribution of exam documents and course books should be revised due to the implementation of semester-based credit system as of 2012 – 2013 academic year.

All the logistic practices are indispensible part of the whole to ensure system sustainability, therefore any breakdown in the activities are highly likely to give harm to the system. The great attempts to ensure problem – free logistic practices are the result of carefully planned work. The most outstanding outcome of the system will be the encouraging positive opinions of the students regarding the quality of logistic services.

In order to achieve this purpose, a questionnaire was designed to obtain the opinions of the students regarding the logistic services

According to the data obtained, positive opinions about the system predominantly outweigh the negative ones. As for the positive ones, the students agree that they do not face any problems in accessing course books and the information about course books, and that the nylon pack covering the books is a good idea to keep all the course books packed together. No negative opinion is stated regarding exam services. The students agreed that exam calendar is strictly followed, exam documents are complete and exam information was always available on demand. Contended with exam services, the students stated that the people assigned for exams provided adequate information regarding exam procedures and regulations and the exams are administered in appropriate and safe conditions and exam papers are graded accurately and on time. Finally, the students are of the opinion that logistic support provided was adequate.

Two issues considered problematic are the physical conditions of bureaus located in the cities and the course book distribution process followed in these bureaus.

When this finding is examined, it is found that the cities where decrease in attitude points is observed (namely, İstanbul, Ankara, İzmir, Bursa, Adana and Kocaeli) are among top ten of the cities having the

highest number of students enrolled. Due to the high number of students and the frequency of regular enrollment days, and the insufficient number of staff for such a large number of students, the bureaus face problems while distributing course books and offering other services. However, the result obtained from this study clearly shows that the bureaus and course book distribution process should be revised and necessary improvements must be made accordingly.

This questionnaire study aims at exploring whether there is a relationship between demographic variables and attitude points regarding exam procedures and course book distribution services. The results showed that there is a significant relationship between attitude points regarding exam procedures and course book distribution services and demographic variables such as age, years of education, gender and the locations where students live in.

When age variable is examined, it is observed that the older the students, the higher the attitude points regarding exam and course book distribution services. Similarly, as for the years of education, attitude points regarding exam and course book distribution services increase as the years of education received increase. When gender variable and attitude points towards exam and course book distribution services are examined, it was found that female students had higher attitude points than males.

The relationship between the places the students live in and their attitude points towards exam and course book distribution services reveals that these points are lower in the cities where a large number of subject students live. The reason for this decrease is believed to be due to the problems faced during the times of registration and course book distributions in the bureaus that have to deal with greater number of students.

The type of the programs the students are enrolled was not found to have a significant effect on attitude points regarding exam and course book distribution services. In other words, whether the students are enrolled in undergraduate or graduate programs do not affect their attitudes towards exam and course book distribution services. The overall conclusion that might be obtained from this study is that the students attending Anadolu University distance education programs are generally satisfied with logistic support services and the system is ready for any possible changes and improvements.

The results of this study are expected to be a useful guide for the institutions operating in education and other fields. When the attempts by other Turkish universities to initiate distance education programs are considered, this current study is quite likely to provide useful information for these institutions.

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