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Clustering Analysis of Students' Attitudes Regarding Distance Education: Case of Karadeniz Technical University

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This study aims to determine the clustering tendency of computer programming students' attitude variables regarding distance education who are educated by this method. This study was carried out in fall semester of 2012-2013 academic year. Sample of the study consists of 92 students studying in the department of distance education computer programming in Karadeniz Technical University. "Distance Education Attitude Survey" consisting of 35 items is used as a data collecting tool. The obtained data is analyzed with Ward method which is one of the hierarchical clustering methods. According to the cluster analysis, it is seen that attitudes of the students regarding distance education are collected in three main groups as A, B and C. Among these clusters, cluster A has sub clusters as A1 and A2 and, cluster C has also sub clusters as C1 and C2. These clusters are named in accordance with the variables they consist as follows: "A1: Positive effects of distance education on learning", "A2: Content and materials of distance education", "B: Place and importance of distance education", "C1: Deficiency and unreliability of distance education", "C2: Inferiority of distance education and its negative effects on socialization". When it is evaluated generally, it is seen that clusters A and B reflect the positive attitude variables, C on the other hand reflects the negative attitude variables.

Introduction

Developments in information communication technologies have brought lots of innovation to education as any other field. In recent years, Internet has become an indispensable part of the daily life and education/teaching activities have been began to be performed in this environment. This situation provides significant opportunities to educational institutions in different level, especially to universities for creating environment being available for every one (Aggarwal, 2000). In terms of this the influence of Internet on education may be in high level (Horzum & Balta, 2008). Increasing number of students and work conditions have resulted in the rise of distance education as an alternative education model for traditional education (Akça, 2006). At the present time, lots of tools like asynchrony, synchrony, virtual classes, bilateral interactive voice and video components are included into distance education environment (Beldarrain, 2006; Kesim & Ağaoğlu, 2007). This situation increases the quality of education performed in distance education environment.

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There are a lot of studies comparing distance education with face to face education. Results of these studies have shown that when some requirements are performed in distance education, the education made in this environment is as successful as the one performed in face to face education (Uzunboylu & Ozdamli, 2009).

Several researches related to education have shown that there is a positive and significant relation between the affective characteristics and academic success of the students (Islim, 2006; Şimsek, 2012). It is known that one of the most important signifiers of affective characteristics of the students about the course is their attitudes toward the course. (Erden & Akman, 1995). In current literature, it is generally focused on effectiveness of these environments such as technical support, learning outcome, methods, interactions, communication, adaptability and motivation (Abdous & Yoshimura, 2010; Guichon, 2010; Karaman, Aydemir, Küçük, & Yıldırım,2013; Kidd & Stamatakis, 2006; Ng, 2007; Yüksekdag, 2012). In the studies conducted for investigating attitudes regarding distance education in literature, the relation between the attitude and different variables (gender, level of computer using etc.) is generally researched. There is not any study related with the clustering tendency of the attitude variables relating distance education. The aim of this study is to determine the clustering tendency of the attitudes of distance education computer programming students regarding distance education. Attitudes of the students should be determined well in order to increase the efficiency of distance education. In this regard, clustering tendency of the students' attitude variables regarding distance education will enlighten the studies to be made in this field. In this regard research question of this study is as follows:

- What are the clustering tendency of students' attitude variables relating the distance education studying in distance education computer programming?

Related Works

In the literature, there are various studies on attitudes of students regarding distance education. Ateş and Altun (2008) analyse the attitudes of the 3rd and 4th class students from department of Computer and Teaching Technologies Education regarding distance education in terms of gender, class level, getting distance education, and experience for computer using, perceived computer skill and learning styles. The results of this study shows that the attitude regarding distance education does not necessarily differ relating to gender or class. On the other hand, whether they get distance education before or not, their experience for computer using and their perceived computer using skills have a significant effects on students' attitudes regarding distance education. Brinkerhoff and Koroghlanian (2005) analysed the computer skills of the university students and their attitudes regarding the Internet based education in two stages. They looked firstly for relation between their skill for computer using, experience for computer, whether they get Internet based class or not and their attitudes. The attitudes of students are generally seen as neutral in this stage but it is confirmed that the ones who take Internet based education before have more positive attitudes. They inspected whether there is a change within the time in attitudes of students toward the Internet based education in the second stage. According to this it is seen that even if there are some improvements in students' attitudes in four years period, they stay relatively stable. Dick, Case, and Burns (2001) inspected the attitudes of 270 graduate and undergraduate students regarding distance education in USA and Australia. According to the findings obtained from this study, it is shown that their attitudes regarding distance education is at a level near to indecisive and majority of the students see distance education as a

secondary choice. Drennan, Kennedy, and Pisarski (2005) evaluated the views of 248 students from different class and departments about a distance education class supported with face to face class environment. According to the results of this study, in this class for which distance education method is used, students' easy access to class materials, being able to use these materials, and autonomous, independent learning and having inner audit focus as learning style influence the learning. And another result is that the students who have computer using skill in advanced level can adapt these classes easily, solve the probable technical problems and have positive views about distance education. Şahin (2007) used Distance Education Learning Environment Interview (DELEI) and investigated the relation between the determinant variables stated below: support of educator, student interaction and cooperation, personal interest, specific learning, active learning and student autonomy. 917 students from Anadolu University participated in this study. Finding of this study shows that four of the 6 variables of DELEI which are named as personal interest, support of educator, active learning and specific learning have an important and positive relation with satisfaction of student.

Şahin and Shelley (2008) produced a model in order to determine the satisfaction of university students about distance learning named distance education student satisfaction model. The sample of investigation consists of 195 students. Researchers have tried to determine the student satisfactions by using four factors (computer knowledge, flexibility of distance education, efficiency of distance education and the satisfaction of distance education). According to the findings it will be beneficial to take into consideration the students' computer knowledge and flexibility of distance education, and perceives such as the perceived efficiency of distance education for determining their satisfaction with class technology and their success in online learning environment. Results of the study put forwards that these factors are necessary for supporting the student satisfaction. Çalli at al. (2013) researched the effects of some variables on the learning process of 930 distance education students. Findings of this study shows that among these variable perceived entertainment, easy to use, effectiveness of multimedia content have an important influence on perceived usefulness. It is also observed that perceived usefulness and entertainment, and multimedia content effectiveness influence the satisfaction. Yüksekdağ (2012) in his study used a survey to investigate the attitudes of psychiatry nurses according to their demographic features and their status for using computer/Internet besides their attitudes regarding distance nursery education. This research shows both that the survey is valid and reliable, and the sub dimensions of the nurses' attitudes regarding interactions in distance nursery education. Karaman et al. (2013) carried out a research to reveal the key components for making an effective virtual class section in terms of environment and method. Researchers used faculty of theology, degree of undergraduate completion distance education virtual class environment in their studies. In this program semi structured interview has been regularly applied to 20 participants consisting of 8 educators, 10 students and 2 technical officers. This study revealed that virtual class environment can be arranged better and it should include interactive activities besides a better technical support. The important educational technics for virtual classes should be thought as active participation of student, summary of the materials, capturing the attention of the student and a partnership with real life in high level.

Method

Descriptive approach and relational screening design from general screening methods are used in this study. It is aimed to determine the existence and degree of covariance between two or more variables in relational screening method. (Karasar, 2006).

Study Group

This study is conducted with 92 students studying in Karadeniz Technical University, distance education computer programming in the 2012-2013 academic year.

Data Collection Instrument

Distance Education Attitude Survey (Kışla, 2005) consisting of 35 items is used in this study in order to determine the attitudes of student regarding distance education.

Data Analysis

Ward method, one of the Hierarchical Clustering methods is used in order to determine the clustering tendency of the attitude variables of distance education computer programming students toward distance education. Quadric Euclidean distance is chosen as similarity/difference measure in calculation of the distance between the variables. Similarities between the variables of attitudes are presented in dendrograms. SPSS 16.0 statistical pocket program is used for the analysis of data.

Findings

On the purpose of answering the research question, the data obtained from survey consisting of 35 items used for determining the attitudes of distance education computer programming students regarding distance education are subjected to the hierarchical clustering analysis. Ward method is used for determining the clustering tendency of data. Quadric Euclidean distance is chosen as distance measure. The obtained data is presented in Figure 1. It is seen that views of the students are collected in three main cluster as A, B and C according to the dendrogram in Figure 1. These clusters are named as; cluster A "Positive Effects of distance education on learning, and content", cluster B "Adapting the necessity and importance of distance education", cluster C "Negative effects of distance education on application, education and socialization relating to the variables they include". Furthermore it is observed that Cluster A has sub clusters as A1 and A2, and cluster C has sub clusters as C1 and C2.

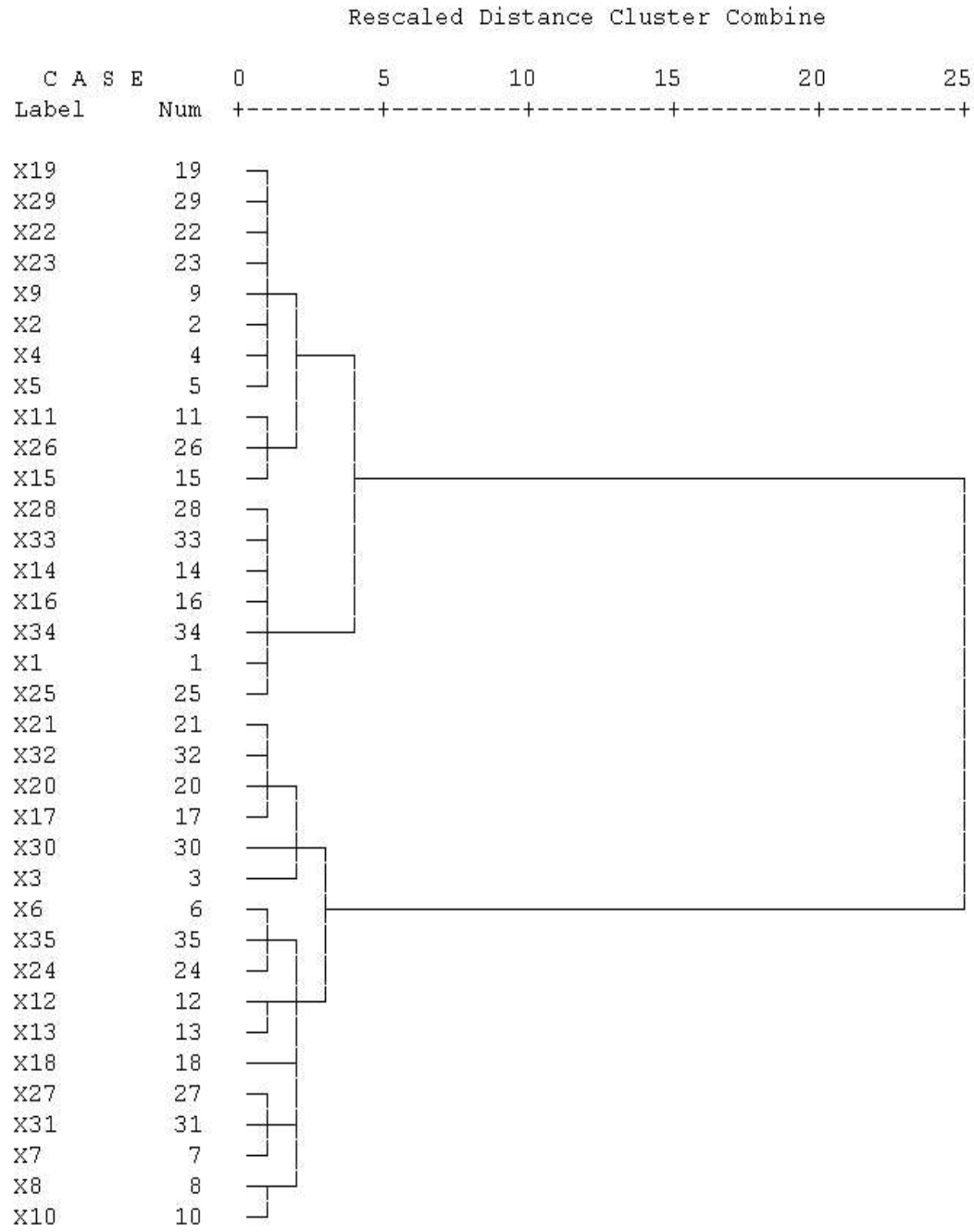


Figure 1. Dendrogram for the Attitude Variables of distance education computer Programming Students

Clusters and sub clusters in which there are attitude variables of distance education computer programming students are showed in Table 1.

Table 1. Clusters And Sub clusters Which Includes Attitude Variables of distance education Computer Programming Students regarding Distance Education

Clusters	***Sub clusters***	***Variables***	***Cluster Manes***
A	A1	X19, X29, X22, X23, X9, X2, X4, X5	Positive effects of distance education on learning
	A2	X11, X26, X15	Content and materials of distance education

B		X16, X34, X33, X1, X14, X25, X28	Place and importance of distance education
C	C1	X21, X32, X20, X17, X30, X3	Inefficiency and unreliability of distance education
	C2	X6, X35, X24, X12, X13, X18, X27, X31, X7, X8, X10	Inferiority and negative effects of distance education on socialization

Cluster A

A1:
(X19) I get motivated better to the class that I take with distance education.
(X29) I learn better with distance education
(X22) Distance Education has positive influence on my creativity.
(X23) Distance education increase the efficiency through its structure.
(X9) Distance education increases the quality of education.
(X2) Distance education improves the learning capacity of the individual.
(X4) Distance education easies the learning.
(X5) Distance education arouses my curiosity.

A2:
(X11) I think the written materials used in distance education are qualified in terms of their content.
(X26) Variety of the materials used in distance education takes my attention.
(X15) I think tools and equipment used in distance education are sufficient.

Cluster B

(X16) I am interested in distance education.
(X34) Distance education attracts my attention.
(X33) Importance of distance education increases day by day.
(X1) I want to take distance education.
(X14) Distance education is at least as prestigious as classical education.
(X25) I think distance education will be the future form of education.
(X28) I am in favour of some classes' being given with distance education in universities.

Cluster C

C1:
(X21) I think that the ones participated in distance education is sufficient in terms of knowledge and skill.
(X32) the certificate taken through distance education does not meet the tuition paid for it.
(X20) I do not thrust distance education programs in Turkey.
(X17) Evaluation methods of institutions giving distance education is not convenient.
(X30) There is a communication gap between the lecturers and students in distance education.
(X3) Most of the classes cannot be made through distance education

C2:
(X6) I think, I can have a good friendship relations while taking distance education.
(X35)I believe distance education will limit socialization.
(X24) It discomforts me that there is not continuous face to face interaction in distance education.
(X12) I believe the certificate that I will take at the end of distance education will be valid.

(X13) Employment possibilities of the ones graduated from distance education are low.
(X18) I think open learning in our country is sufficient.
(X27) The education given through distance education is not useful.
(X31) Distance education declines the success of student.
(X7) Distance education makes people lazy.
(X8) I think distance education is luxurious for our country.
(X10) I do not think distance education will be appropriate for me.

Discussion and Conclusion

According to the results of the clustering analysis, it is observed that the attitudes of students regarding distance education are collected under three main cluster as A, B and C. Among this clusters Cluster A has sub clusters as A1 and A2 and cluster C has sub clusters as C1 and C2. These clusters are named as below:

Sub cluster A1: "Positive Effects of distance education on learning"

Sub cluster A2: "Content and materials of distance education"

Cluster B: "Place and importance of distance education"

Sub cluster C1: "Inefficiency and unreliability of distance education"

Sub cluster C2: "Inferiority and negative effects of distance education on socialization".

When the clusters are examined together with the variables they include, it is observed that Clusters A and B reflect the positive attitude variables and cluster C reflects the negative attitude variables.

Aydın (2012) has stated that students participated in video conference based distance education conducted with 56 students from Anadolu University Faculty of Open Learning have positive attitudes regarding the educators, content and applied strategy. Findings obtained from this study support this study in one hand but it shows a contrary situation on the other hand. While sub cluster A2 includes attitude variables parallel to this study, sub cluster C1 is seen as contrary to this study with the variable (X21) I think that the ones participated in distance education is sufficient in terms of knowledge and skill. In literature, importance of face to face interaction in education is frequently stated (Guichon, 2010; Karaman et al., 2013; Tipton et al., 2011; Yüksekdağ, 2012). Birisçi (2013) has found out that according to students some problems arising from the lack of face to face interaction between the students and the educator decrease the interest for the class. The variable (X24) it discomforts me that there is not continuous face to face interaction in distance education included in sub cluster C2 displays a parallel connection with this result of Birisçi's (2013) study. Ayyıldız, Günlük, and Erbey (2006) state that the biggest disadvantageous of distance education is that distance education is not able to provide the cultural interaction and socialization opportunity as in formal education. There is a consistency between the variables (X6) I think, I can have a good friendship relations while taking distance education and (X35) I believe distance education will limit socialization in sub cluster C2 with this finding of Ayyıldız et al. (2013). Besides, the variable (X24) It discomforts me that there is not continuous face to face interaction in distance education in sub cluster C2 is the problem which is mentioned by Elcil and Şahiner (2013) in their studies on communicational problems in education.

Clusters obtained from the clustering analysis of the students' attitude variables can be analyzed in detail in the following studies. Furthermore influence of the factors such as gender, class, computer skill on these clusters can be inspected. And distribution of these clusters can be examined with qualitative data.

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