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THE EFFECTS OF SMART CLASSROOMS ON THE HIGH EDUCATION STUDENTS' ATTITUDES

ABSTRACT

Smart classrooms are the concept that shows great progress in the recent 10 years of education technology world. This concept evaluated among the distance education systems has its problems about conceptual misunderstandings and what kind of hardware content it should have. In this research, the opinions about attitudes of the students that continues their education in smart classrooms are evamined. In the research, a attitude survey with 51 items devoted to determining aspects related to smart classrooms by researcher as a means of collecting data are preapered. Percentage-frequency and t-test (dependent-independent) for data analysis and also "SPSS12 for Windows" software are used. At the end of the study, smart classrooms that as a new dimension of learning which increase productivity and would be considered as an alternative to traditional education systems added a new dimension to distance education system.

Keywords: High Education, Smart Clacsrooms, Education, Education Technologies, Distance Education

AKILLI SINIFLARIN YÜKSEK ÖĞRETİM ÖĞRENCİLERİNİN TUTUMLARI ÜZERİNDEKİ ETKİSİ

ÖZET

Akıllı sınıflar, eğitim teknolojisi dünyasında son on yıl içerisinde büyük gelişme gösteren yeni bir kavramdır. Uzaktan eğitim sistemleri içerisinde değerlendirilen bu kavrama ilişkin kavram yanılgıları, içeriğinde ne tür donanımsal bir yapının barındırılması gerekliliği konularında büyük sıkıntılar yaşanmaktadır. Bu araştırmada akıllı sınıflarda eğitime devam eden öğrencilerin tutumlarına ilişin görüşler incelenmiştir. Araştırmada, veri toplama aracı olarak, araştırmacı tarafından geliştirilen 33 maddelik akademik başarı testi ve 51 maddelik akıllı sınıflara ilişkin görüşleri belirlemeye yönelik tutum anketi hazırlanmıştır. Verilerin analizi için, yüzde-frekans ve t-testi (bağımlı-bağımsız) kullanılmıştır. Ayrıca "SPSS12 for Windows" yazılımı kullanılmıştır. Çalışmanın sonucunda geleneksel eğitim sistemlerine alternatif olarak düşünülen ve öğrenmede verimliliği arttıracak yeni bir boyut olarak ortaya çıkan akıllı sınıflar, uzaktan eğitime yeni bir boyut kazandıracaktır.

Anahtar Kelimeler: Yüksek Öğretim, Akıllı Sınıflar, Eğitim, Eğitim Teknolojileri, Uzaktan Eğitim

1. INTRODUCTION (GİRİŞ)

In our today's educational systems, traditional classroom environments are used generally. More and more, instructional methods and techniques that are developed in these classrooms are considered to be as the best approaches representing these classroom environments. However, that the number of the students rises and the problems encountered while training enough qualified teachers has made the educational world to search for an educational model that is parallel with the traditional education. The concept of distance education was developed as an alternative approach in order to handle these problems in 17^{th} and 18^{th} centuries. Firstly, training applications started by means of newspaper, and letter, later in 19^{th} century by means of radio and in the 20^{th} century by means of television. The greatest deficiency in these educations is that the attitudes and the behaviors of the individuals cannot be followed, that feedback cannot be provided adequately.

These approaches are examined through certain supervision and control mechanism in the countries which are developing on the study of distance education. In this way, accreditation standards are raised to the certain standards determined by local accreditation agents. The supervision mechanisms, which is a new concept in our country, will be in function in parallel with the improvements of distance education. Thus, distance education will be the most similar approach model to the traditional educational understanding.

Constructive approaches developed towards distance education have constituted certain disadvantages besides many advantages. We can raise the number of such disadvantages as the instructor's need of technical support member, that it takes the student's resting and entertainment times, isolation and dissonance that emerges as a result of its not being able to constitute social environments that provides group synergy, its not being effective on skill attitudes' occurring etc. In order to remove such disadvantages and to benefit from the classroom environment at a high level, the need of developing smart classrooms, which facilitates an education that provides one to one education opportunity between the students and the instructor away as in face to face education and which can integrate more than one education environment simultaneously, has occurred.

In smart classrooms, every student participates to the lesson with the computer which is offered for oneself. This participation will send the information related to the participation of the student to the instructor immediately through the prepared software and these people at distant areas will be able to get more detailed and qualified feedback than the ones in the normal classroom.

In the frame of all these realities, the application of smart classrooms, which are related to distance education in educational technology, has been carried on crawling since 2001-2002. Yet, in recent years, this reality has shown everyone that it is unavoidable. When examined in this aspect, it appears that not only smart classrooms are hardware or software but also it is necessary to examine it in respect of education and instruction. For this purpose "The Effects of Smart Classrooms on the High Education Students' Attitudes" will be examined in this study.

The main purpose of this study is to determine the degree of the effectiveness of smart classrooms on the students' attitudes and to form the characteristics of the educational course software in the smart classroom.

Depending on this main purpose, the answers to the questions below will be searched.

- Is there a difference between the views towards attitudes of the students who receive training in smart classrooms?
- What should be the characteristics of the types of the educational course software that will be used in the smart classrooms?

2. RESEARCH SIGNIFICANCE (ÇALIŞMANIN ÖNEMİ)

One of the important reasons to make this research is that the concept of smart classroom in Turkey and in the world cannot be explained precisely. So, it is that the effects of them on students cannot be expressed clearly. In this context, the research made will carry the value of important data in order to form the environments of smart classrooms. In this frame, we will be able to observe smart classrooms in our country and near geography in the last five years.

First of all, smart classroom applications, which emerged in the frame of the distance education, finds application fields from agriculture to industry, from education to defense and health areas every day. So, platforms of smart classrooms become inevitable with the developing technology.

Another part of the study that is important is to reduce the instructor's anxieties to use such a well found classroom.

The study was held depending on the articles below.

- To form experimental and control groups, equalization of the experimental and the control groups, which are formed by taking into consideration the grade point average of the first four semester and the average grades of the course called "Basic Computer Sciences" in the second semester, is enough from the view of objectiveness.
- Using personal computer skills of the students, their information level about internet are considered to be enough to form the study group.
- The students answered the questions related to academic achievement scale sincerely.

3. WHAT IS SMART CLASSROOM? (AKILLI SINIF NEDİR?)

The concept of smart classroom (areas) or intelligent environments are areas that are equipped with computers, in which data can be exchanged, in which many dotted sensors let the individuals work individually or as a group in an effective way, in which matchless help from computers are taken [1].

Smart classroom is a structure that is equipped with video conference and live broadcast technology that integrate the participants and the instructor who are at different locations physically in an interactive environment [2].

When looked at the emergence points of the smart classrooms;

- Education that is independent from a location.
- Opportunity of education that can be shared in a cheapest way.
- Give the students and university lecturer an opportunity to work together.
- In research development studies in the instructional institutions, advantage of speed time-cost.
- Online and offline studies of important meeting, distance courses, operations, diagnosis from engineering training to language education, from medical training to military areas are main factors that constitute smart classrooms.

When smart classrooms are described as intelligent classrooms, it is seen that conception confusion will occur in expansion and

providing its continuous up to dateness. At all these points such as features of updatableness and continuousness, many descriptions are put forth towards smart classrooms. If these descriptions are looked at;

By means of the integration of network assisted and internet based education with the multimedia applications in the classrooms, classrooms that can use every type of technology has emerged. These locations are called smart classrooms.

Also in other resources, smart classrooms, which are called electronic classrooms in which it forms new exchanges on the concepts of learning-teaching and artificial intelligence applications constitutes the basic of these exchanges, close the technological gaps in schools [3].

Students in the smart classrooms can reach all types of data on earth over the monitor of the computer in an easier way; and can share all types of data inside or outside the classroom. This example shows us that internet makes the world a small village. We can also accept smart classrooms as the workroom of a student who continues her/his education by means of distance education or a classroom environment in an instructional institution. The main reason for the emergence of smart classrooms, as in the concept of distance education, is derived from a search for a solution to the problems in educational area. The entrance of this concept into the educational literature coincides with 1995 year and end of it [4]. In Winer's study, forming smart classrooms inside the instructional institutions and artificial intelligence applications that affects the decision making process inside the smart classrooms were discussed.

The greatest difference of the smart classrooms from the traditional ones is that all the things happen in the classroom environment can be recorded and examined later. This process has been identified with the term smart. However, in the later researches, the smart classrooms, which is used in the distance education system, is described as the system which will raise the human computer interaction to the top level at many points for the instructors [5].

Starting from the other descriptions, as the most general meaning, smart classroom is; a new constitution which integrates electronic areas and human interface and which integrates technology and traditional teaching methods to form an innovative, advanced, flexible and sharing learning environment in the information age in which basic learning skills becomes much more important than the former training systems. Furthermore, it is the best configuration which makes distance points near and makes learning wide. In this configuration, it is seen that human computer interaction occurs at a high level [6].

3.1. Smart Classrooms and Distance Education (Akıllı Sınıflar ve Uzaktan Eğitim)

Smart classroom is a distance education application. In the results of the researches made, it is seen that distance education applications developed depending on the smart classrooms gives successful results when compared to the traditional educational systems.

There should be a communication way in order that distance education can occur. Satellites, telephone lines, lines of fiber optic and groups of protocols and software which is defined on these physical structures constitute the basics of the communication. Internet is the most frequently used and the most widespread mean of communication in the world. It has a very flexible structure since it supports different means of communication and software.

Distance education with internet is preferred because it saves all the advantages of distance education and reduces the disadvantages. Moreover, internet provides software and hardware infrastructure which will support both synchronous and asynchronous distance education [7].

From the view of elements in distance education, the instructors' roles and the roles of those in face to face education are different [8]. Despite these differences, this has been reduced to a minimum level in today's smart classrooms.

Although smart classrooms take place inside distance education applications, it is seen that they differ in difficulties and problems encountered during the application.

3.2. How a Lesson is Given in a Smart Classroom (Akıllı Sınıflarda Nasıl Ders İşlenmektedir?)

On the foundation of distance education, there are channels which enable the individual to learn by oneself. These channels are such devices as printed materials, television, radio, video and computer [9]. The process of this system has differed in environments belonging to smart classrooms. The most important change here is that it can have co operational learning along with personal learning belonging to the individual. In this context, smart classrooms have formed education environments in which lessons are given in a different way.

In a smart classroom, a lesson is given in direct proportion with the need of appropriate hardware and software's being met. In this context, the instructor uses an electronic board in a smart classroom of which all the need is met. All the notes which the instructor write on this board is reflected to the students' computers and the students save these notes to their computers or flash discs which they carry with them by means of word processing package programs. The students can revise the topic anywhere outside the classroom by saving audio visual frames besides text contented data to these discs. The instructor can see the applications of the students in his/her own computer while distributing the notes to the students' computers and the instructor will provide information interaction among the students at the moment the applications let the students interact with each other. In such training, no matter what high technology is used between the instructor and the students, the environment of classroom in face to face education will be supported in a way. We call such classroom applications smart classrooms with the instructor. Another class application is a class application that attends to smart classrooms on internet. We see an example of this in our country in between Middle East Technical University (METU) and Suleyman Demirel University. According to the protocol which was made between these two universities, the students of Suleyman Demirel University who take the same course attend to a smart classroom application with the instructor at METU simultaneously thorough video conference over internet by means of an assistant. In this type of training, an instructor away is accessed. The greatest advantage of a smart classroom application under the roof of distance education which occurs in this way is that all the things concerning body language belonging to the instructor and the students are in view and that the instructor can follow the movements of the students which s/he wants to see inside the classroom while providing feedback. Moreover, in smart classrooms, smart classroom applications and smart assessment systems are used extensively and every student prepares a digital portfolio individually during the process of evaluation. At this point, on which walls the instructor will reflect the image of the

students at different points becomes important. So an effective classroom management will be provided.

Furthermore, at McGill University, in Canada, in the smart classroom, digital notes written on the board can be presented online on internet synchronized with the audio-visual recordings of the instructor by means of cameras.

Designs and developments of smart classrooms at McGill University started in 1999 fall semester in this university and this application amazed everyone. First of all, a room in McConnell engineering building was equipped with audio-visual electronic board which can be recorded by a computer, VCR, digital pencils. The system was fixed perfectly in every lecturer's rooms and the lecturers could make presentations in their rooms by means of computers. Two things were arranged in this way [4].

- Transparent interface emerged for multi-class environments, which the lecturers want.
- Students save all types of presentations, slides and lecture notes on internet automatically.

However, the statements mentioned above concerning how to teach is valid for a smart classroom which has enough software and hardware substructure. So, equipment features belonging to a good smart classroom should be taken into consideration.

3.3. Software in Smart Classrooms (Akıllı Sınıflarda Yazılım)

The softwares used in smart classrooms are those prepared by the institutions who prepare educational software as package programme. The factors to pay attention in the production of this prepared software; there is teamwork, infrastructure, training specialists, computer specialists, and area specialists. The most frequently used software language today in producing smart classroom software is JAVA. The greatest feature of the programmes written in this software is that the prepared package programme can be re-arranged to its own features by the educational institution [10]. A platform of software development which is applied in this way is seen as free source coded. The benefit of using free source coded software is that it can be updated by the educational institution continuously. Another important feature is that educational institutions can modify the software towards their goals.

The software that will be used in the smart classrooms will be effective on providing the integration of electronic area and human interface and arranging the students' behaviors inside the classroom. As an example for the developments concerning the software, the programme that Franklin called Gargoyle and that was written on the platform of java, and the software for smart classrooms that was named Perseus on the platform of C++ were developed. In the results of performance test between these softwares, superiority of the software written on the platform of java was revealed clearly [11].

3.3. The Advantages of Smart Classrooms (Akıllı Sınıfların Avantajları)

- Data can be saved on the instructor's and every student's computer reciprocally.
- The student and the instructor can use the data and images obtained from the cameras during the video conference whenever s/he wants.
- It is used as a control mechanism from the view of achieving the goals in education in an easy way.
- The student does not take down notes excessively.

- Learning occurs at a high level,
- Assessment related to the course is more objective.
- Learning occurs at the student's own speed.
- It constitutes the most suitable environment for the cooperative learning.
- It is the most effective bridge between the school and the house
- It can include the students from different geographies to the classroom environment virtually.
- It is a simultaneous application, but the recordings of the data obtained give a handle to asynchronous applications.

3.4. The Disadvantages of Smart classrooms (Akıllı Sınıfların Dezavantajları)

- It is an expensive application,
- Need for professional instructors who can use the technology well is too much,
- Architectural structures of traditional classrooms are not appropriate for smart classroom applications.
- That those individuals who use smart classroom are exposed to radiation.

4. RELATED RESEARCHES (İLGILI ARAŞTIRMALAR)

Gürol, in his study named "Usage of Television at Fırat University and the Students' Attitudes", has constituted reference concerning the smart classrooms in today's changing educational models with the new technological and need determination, which is revealed in the table 1.

Table 1. Changing educational models and technological need
(Tablo 1. Değişen eğitim modelleri ve teknolojik ihtiyaç)

Former Model	New Model	Technological Need
Lectures done in the classroom	Individual research	PCs that have access to data in the network environment
Passive assimilation	Apprenticeship	Development of skills and simulation need
To work alone	To learn with the team	Benefiting from collective work devices and email
The instructor who knows everything	The instructor who is a guide	Depending on accessing to the specialists in network environment
Unchanged content	Quickly changing content	Need of network and broadcast devices
Homogeneity	Variety	Need of variable access devices and methods

Reference: (Gürol, 1997)

According to the table seen above, changing educational models are important points of reference that form the basic requirements of today's smart classrooms. The most important feature of new educational models is that they remove the walls of the classroom. Gürol, in his study, talked about such double way communication technologies as audio conference, graphical conference and others [12]. However, the most important element in this study was desktop video conference, which is the smart classroom's point of reference today.

In their study named "Smart classrooms' Guidance by means of the instructors who use the technology", Chisholm and Wetzel (2001) have taken 157 instructors who use the technology into the sampling. It was determined that the participation to the classroom activities rose thanks to this instructor's centralizing the students with the technology. Yet, today many instructors do not use technology deliberately due to the cultural differences and prejudice of inessentiality [13]. This situation is not a surprising one.

In his study "Developing an Electronic Classroom", Cavenagh (2002) describes smart classrooms as a fact that consists of DVD, CD player, Computer and Projection and he focuses on the cost of these classrooms. However, today's smart classrooms are out of this study [14].

In his study named "Educational Environments belonging to the Smart Slassrooms", Darrow (1998) states that smart classrooms have variable technological content and that development and distribution of the smart classrooms are examined in learning environments [15]. Smart classrooms include variable technological ways;

- Series of technological educational and instructional modules
- Variability of computer assisted multimedia sources
- Electronic network in expanding the access to the interaction of data and human source
- Computer assisted data management systems
- Usage of the programmes concerning the structuring of collective data [15].

In his study, Darrow (1998) states that studies relating to the smart classrooms had been held since the beginnings of 1990. For this reason, they put into practice the first laboratory that they called TechLab200, in which they wanted to constitute creative educational systems.

In their study named "Making Collaboration Wide by using Computer Technologies and Smart Classrooms", Yau and his friends (2003) searched for the basic characteristics of smart classrooms and as a background study, the effects of collaboration here were described as data sharing, authority sharing, collaboration between the classroom environment and heterogeneous group [16].

In his study named "Helper of the Instructors; Data sharing and Individualism in the Smart Classrooms" Ichnowski (2004) examined computerizing architecture in smart classrooms in which software of pre-loading, laptop and such portable devices make themselves known dynamically anywhere at San Francisco State University. In this study, software of the customers was installed dynamically by using java (JINI) technology [17].

In his study, Winer (2002) discussed educational reflections of smart classrooms in Computer Department, the Faculty of Engineering, at McGill University. When looked at the results of the inquiry that was obtained at the end of a lesson in 2000 fall semester;

The lectures given in the smart classrooms were transmitted both in the smart classroom environment and later in internet environment by means of the recordings. Firstly, while some students still expressed the validity of learning by writing and doing, the majority said that this learning type was mind blowing and it would be the teaching model of the future. These students said that "since we have difficulties both in writing and in listening and in comprehension simultaneously, smart classroom environments enable us to retake the lecture later in internet environment." So, it constitutes a hybrid classroom environment [4].

When looked at the answers obtained from the registered 198 students who took the course and the subjects;

- Did the lectures you took in the smart classroom environment make any change on your learning objectives?
  75 people reported a positive change, 8 people reported a negative one and 4 people stated that there were no change.
- Would you like to take another course in the smart classroom environment?
  54 people said yes, 8 people said no, 4 people said that they had no decision.

These results are drawing a satisfactory table of distance education in the faculty of engineering where applications are dense. The study held in 2000 shows the way to the limitations of internet bandwidth and that today's applications will give more satisfactory results.

The greatest problem encountered in smart classroom applications in schools is prejudices towards these classrooms and that the instructor cannot get used to the interaction in this environment immediately. This appears also as one of the greatest problems encountered abroad.

There is a difference between the understanding of classroom management and the one in the smart classrooms from the view of pedagogy. These differences are, at first stage, the instructor's appropriating the classroom that s/he is in, and disregard the other classrooms, sharing difficulties. However, after the second and the third lesson, this problem disappears.

5. THE MODEL OF THE STUDY (ARAŞTIRMANIN MODELI)

In the study, it was tried to determine whether or not smart classes, which is an independent variable, affects the attitudes, which is a dependent variable. So, the study was held on an experimental model.

An experimental and a control group were formed as the essential of experimental research model. While forming the experimental and control group, it was predicated on the student's having similar features and so on the experimental and control group's being formed. At the stage of determining the experimental and control groups, similar groups were formed by taking into consideration the grade point average of four semesters and the grade point average of the third year students in Faculty of Technical Education, Electronic and Computer Education in the course 'Basic Computer Sciences' (Analysis of Cluster). According to this, groups and features of them are like below;

5.1. System and Sampling (Evren ve Örneklem)

Students of 1st and 2nd education in Faculty of Technical Education, Electronic and Computer Education at Fırat University constitute the system of the research. Among the students of 1st and 2nd education in Faculty of Technical Education, Electronic and Computer Education, third year students of 1st and 2nd education who take the course named Instructional Technology and Material Development were chosen when determining the sampling of the research.

Table 2. Determining the system and sampling groups
(Tablo 2. Evren ve örneklem grubunun belirlenmesi)

System / Sampling	System	Sampling	Experimental
Computer Edu. 1nd Teac.	51	21	33
Computer Edu. 2nd Teac.	32	19	
Total	83	40	

5.2. Choosing the Sampling Group (Örneklem Grubunun Seçilmesi)

While forming the experimental and control group, the articles below were taken into consideration.

- Academic achievement grade points for the course BIL162 coded 'Basic Computer Sciences' of the students in the second semester of the fourth year.
- Excluding 2005-2006 academic year, academic achievement grade point's average that includes four semesters.

These two criteria were used for the purpose of providing objectiveness. 50 students were excluded from the study by examining the collected data relating to the students. Some students were considered not to be enough for forming the groups; some students had problems with attendance.

5.3. Data Collecting Tools (Veri Toplama Araçları)

In order to collect data in the study, attitude inquiry was applied toward the views of the students in the experimental group about the smart classrooms.

At the first stage, attitude inquiry consisted of 67 questions. From the view of appearance validity and structure validity, specialist view was consulted to. After consulting, totally 51 article was left in the inquiry.

Before starting the research, 72 items of pre and post test (academic achievement and attitude inquiry) that was distributed to the third year students of 1st and 2nd education in the Faculty of Technical Education, Electronic and Computer Education at Fırat University was distributed and collected. After the research, same inquiry and academic achievement scale was collected by the instructor in the semester.

5.4. Data Analysis (Verilerin Analizi)

In the data analysis chapter, the operations below were done. Data obtained from pre-applications and post-applications were processed with SPSS for Windows 12.0 package programme.

Percent and frequency statistics were done to determine the views concerning the attitudes.

For interpreting and the analysis of the data collected from the inquiry related to the attitudes of the subjects towards smart classrooms, fivefold scale breaks was determined at a level of 0.08 (5-1=4, 4/5= 0,80).

6. FINDINGS AND COMMENTS (BULGULAR VE YORUMLAR)

In this chapter of the study, sub-aims that are in the quality of problem situation and statistical findings that are done relating to these aims will be discussed. Moreover, in the light of these findings, comments will be expressed.

6.1. Findings and Comments Concerning the First Sub-Aim (Birinci Alt Amaca İlişkin Bulgular ve Yorumlar)

In the findings concerning the second sub-aim chapter, the relationship between the views relating to the attitudes of the

experimental group will be evaluated from the view of differences between the pre and post test of the experimental group and their Pre-Post Tests points. So, it was determined whether or not there were meaningful differences between the attitudes of the students who received lesson before the training and their views relating to their attitudes in the smart classrooms after training.

The results between the answers that the students who received training in the smart classroom gave to the questions of the inquiry before training and the answers that they gave in the post test are given in the table 3.

Table 3. Results of t-test to determine the experimental group's pre and post test attitudes about smart classrooms
(Tablo 3. Deney grubu ön test ve son test akıllı sınıflara ilişkin tutumları belirlemeye ilişkin görüş belirlemeye yönelik t-testi sonuçları)

	N	X	S	Sd	t	Signifance Level
Pre-Test	33	180,84	15,76	32	6,33	,00
Post- Test	33	190,96	18,06			

*P<0,05

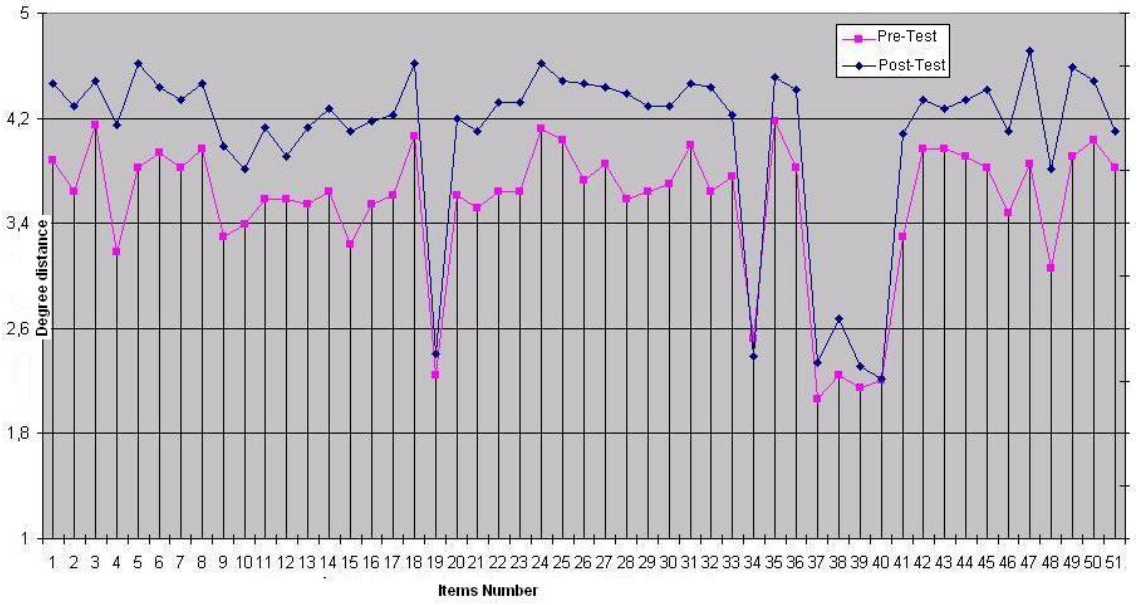
It is seen in the table 2 that there is a meaningful difference at a p<0, 05 of signifance level between the pre-attitudes and post-attitudes. From the view of arithmetic averages, there is seen an important difference (t=6, 33). In meaningful difference's emerging in the result of this test, that the smart classrooms have equipmental features to raise effectiveness in learning and that smart classrooms are based on visual applications lay the groundwork completely to form positive changes in the students' attitudes towards smart classrooms. All the details of these differences were given in the table 4 with arithmetic averages.

Table 4. Attitude inquiry towards determining views about the smart classrooms
(Tablo 4. Akıllı sınıflara ilişkin görüş belirlemeye yönelik tutum anketi)

Questions to determine the attitudes
1) It is interesting to learn the course in the smart classroom.
2) Data presented in the smart classroom environment is very clear.
3) I like receiving training in the smart classroom environment.
4) I find making lessons in the smart classrooms easy.
5) It was entertaining to learn the course in the smart classroom environment.
6) To study in the smart classroom was amusing.
7) I remember what I have learned in the smart classroom better.
8) I would like to study in the smart classroom
9) While studying in the smart classroom environment, I felt that learning process was under my own control
10) I would like to study the other courses in the smart classroom environment.
11) While studying in the smart classroom, I feel an intense appetite to learn.
12) While studying in the smart classroom, I think that I use my skills in a more effective way.
13) While studying in the smart classroom, I give my all attention to the topic I study.
14) While studying in the smart classroom, I make a great effort to learn.
15) While studying in the smart classroom, I feel myself secure.

16) While studying in the smart classroom, I feel myself comfort.
17) What I have learned for the course is interesting for me.
18) It was important for me to end the course successfully.
19) I do not want to learn more on the subjects we study.
20) The content was arranged in a way motivating to learn.
21) The data presented was at a level of meeting my expectations.
22) Integration of the topics in the course I studied was provided.
23) While studying this topic, I felt that I would be successful.
24) I think what I have learned will be useful in the future.
25) Examples contributed to my knowledge' being permanent.
26) At the beginning of the course, my interest to the topic rose.
27) There were a lot of things that would attract me in the material development topic.
28) The difficulty level of the course was appropriate. It was neither too hard nor too easy.
29) What I learned could be applied in daily life.
30) My curiosity towards the topic was stimulated often.
31) I have learned new things relating to the material development.
32) What I learned supported what I knew before.
33) Smart classroom environments are effective on my achievement.
34) The thought of attending to a course in a smart classroom disturbs me already.
35) I would like to receive training in the smart classrooms.
36) Smart classrooms are not boring classroom environments.
37) Since smart classroom environments are confusing ones, I do not want to receive training there.
38) I think that smart classrooms are not different from the other classroom environments.
39) Even though smart classrooms are boring, I have to continue my education in this classroom.
40) The concept of smart classrooms disturbs me environmentally.
41) Smart classrooms are those I dream.
42) Smart classroom environments are effective on forming a creative personality.
43) Smart classroom environments are effective on gaining problem solving skills.
44) Smart classroom environments affect motivation positively.
45) Smart classroom environments are those that are cheery.
46) Smart classroom environments are effective on gaining sense of excellence.
47) Smart classroom is the most important development that provides equality of opportunity in education.
48) Mistakes appearing in smart classrooms affect education negatively.
49) Everyone has the right to receive training in the smart classroom.
50) Smart classrooms are effective on gaining group sprit and collective learning.
51) Smart classroom environments are effective on doing original studies.

In the Graphics 1 above, pre and post test arithmetic average points concerning every article in the views towards the attitudes of the students are given.



Graphics 1. Item listing of the views towards the attitudes
(Grafik 1. Tutuma ilişkin görüşlere ait madde sıralaması)

It is seen from the graphic above; while the students were hesitant or anxious about smart classrooms before the training, after a training lasting four weeks, view towards the attitude changed positively. In this situation's emerging, that there is data sharing in the smart classrooms, a flexible distribution and a more visual structure has played an important role.

From the graphic above, these statements below towards the attitude can be indicated.

- It is interesting to take a lesson in the smart classroom,
- Data is more visual and clear,
- Taking a lesson is easier and more pleasurable,
- Every session occurs in an amazing application,
- Students want to take a course in smart classrooms in the other times also,
- The student can control the learning process easily,
- Smart classrooms are reliable environments,
- Every class can be terminated successfully,
- Smart classrooms are the best environments for the future,
- They are effective on data's being permanent,
- They are effective on motivation towards the course,
- They are important to balance the difficulty level in education,
- Uneasiness in entrance to the smart classroom give its place to an environment that is reliable,
- They are effective environments on material development
- They provide the equality of opportunity in education
- They are environments that are not boring but amazing.
- When looked at the Graphics 1, there happened positive changes in views towards the attitudes mentioned above.

6.2. Findings and Comments Concerning the Second Sub-Aim (İkinci Alt Amaca İlişkin Bulgular ve Yorumlar)

In order to reach this sub-aim, educational software features that will be used in smart classrooms will be determined. While

preparing educational software, it should be taken into consideration that it will be for smart classrooms. Courses that can be learned by oneself stand in the forefront. At this point, firstly, smart lessons should be explained. Smart lessons, firstly, were designed in order to reveal the structure and the control list of the concepts that emerged mistakenly or correctly in the military of America and Canada as a controlling element. The results that are obtained from the smart lessons were applied to the traditional lesson systems in accordance with the criteria accepted.

By means of smart lessons or new techniques, a lesson can be given successfully; by means of them we can escape the problems.

In this way;

- We can have an informal politics or procedure,
- If something is wanted to be repeated,
- If a problem is wanted to be handled or an act is wanted to be confirmed
- How to avoid making a mistake again
- If we ever do not want to do something again, we use smart classrooms.

Smart lessons (lessons that learn) are used today by space agency in America, Europe, and Japan currently. Systems of smart lessons that learn exist in order to support the organizational processes. Furthermore, they include both human and technological topics as an organizational process [18].

Educational course software is a software which aims that students participate to learning actively, which aims to encourage them, motivate them, attract them cognitively, which reveals interface designs between the instructor and the learner and between the learner and the computer [19].

In interface design, needs of the learner and the teacher stand in the forefront. These needs change depending on the learning situation. Needs of the learner becomes important in individual learning whereas, in the classroom environment, teacher-centered orientation becomes important from the view of control mechanism. One of the concepts that play important roles in today's educational course software is learning approach with games. Apart from this approach, educational course software (Computer assisted learning, Computer assisted consultancy, and electronic books) should be integrated with the traditional course books and applications so that an integrity can be provided. Educational course softwares differ with instructional steps in accordance with the features of developmental stages.

While in pre school stage or pre-operational stage, such topics as object permanence, conservation or language acquisition are prior, in concrete operational stage, studies towards analyzing abstract events with the concrete ones should stick out. Therefore, educational course softwares should be prepared in accordance with the features needed concerning the certain age phases.

Of course, while preparing softwares, they will be constituted at the end of a process. Educational course software that will be used in the smart classrooms are divided into two groups as internet based or computer based [20].

6.3. Characteristics That Are Wanted in Educational Course Software (Bir Eğitsel Ders Yazılımında Aranan Özellikler)

- Interface that can be understood easily.
- User centered flow algorithm design
- Concept of module that provide easy and quick access to data

- The topic should be supported with games content oriented.
- The software should be able to be supported with internet connection related to the topic
- They should have exercises concerning the topic, tests, comprehension studies, dictionary, and opportunity to record voice, vocalize the written scripts and visual video supported features.
- It should be able to improve the collaboration among the students.
- It should move as data source.
- It should be structured as an imaginary laboratory and here the students can share data and make experiments without using expensive equipment and encountering any difficulty.
- It should be used as a tool in order to teach the students who begin education yet more concepts and operations besides the traditional education understanding in a little time [22].

Characteristics of the interfaces belonging to the educational course software, which is expressed in the first article, are important to make the software interesting.

6.4. Characteristics of the Educational Course Software User Interface (Eğitsel Ders Yazılımları Kullanıcı Ara Yüz Özellikleri)

- Appropriateness for every type of environments should be provided (from traditional environments to internet environments)
- Dictionary of terms should be placed in the software
- Notes that will motivate the students should be placed in the software, design that will provide motivation and make the software amusing
- There should be a button that can print all types of scripts and graphics.
- Network connection explorer should be structured.
- A help menu should be placed [21].
- Those mentioned above are things that should be placed basically in the software. However, one of the points that should be paid attention in educational course software is that this software facilitates minimum configurations.

7. RESULTS AND DISCUSSION (TARIŞMA VE SONUÇ)

In the result of the study, it is seen that, as a result of the educations done in the smart classrooms, smart classrooms under distance education systems forms a new classroom model for the future. Smart classrooms have enabled the students to express views about positive behaviors relating to the attitudes. Smart classrooms increased the students' interest to the course, their motivation.

When looked at the characteristics of the educational course software types that will be used in the smart classrooms, the features that will be mentioned below have appeared.

- Interface that can be understood easily.
- User centered flow algorithm design.
- Concept of module that provide easy and quick access to data.
- The topic should be supported with games content oriented.
- The software should be able to be supported with internet connection related to the topic.

- They should have exercises concerning the topic, tests, comprehension studies, dictionary, and opportunity to record voice, vocalize the written scripts and visual video supported features.
- It should be able to improve the collaboration among the students.
- It should move as data source.
- It should be structured as an imaginary laboratory and here the students can share data and make experiments without using expensive equipment and encountering any difficulty.
- It should be used as a tool in order to teach the students who begin education more concepts and operations besides the traditional education understanding in a little time [22].

When comparing the results of the study to the other studies that were done before, smart classrooms were examined from the view of the usage of the system, installing the system and the development of the software belonging to the system up today.

The study revealed the first data about the attitudes in the smart classrooms in the world. Furthermore, lastly, descriptional data about the development of course software prepared for the smart classrooms and what type of course softwares should be used in the smart classrooms were revealed.

8. SUGGESTIONS (ÖNERILER)

- In turning into smart classroom environments from traditional classroom environments, in service training for the instructors should be prepared so that s/he can change the attitudes positively.
- Smart classroom should have a structure that can be updated any time.
- Smart classes should be equipped flexibly considering the training that will be given
- Research development unities that will produce educational softwares for smart classrooms should be established.
- Smart classrooms should not be confused with video conference classrooms conceptionally from the view of efficiency in the learning and teaching environments.
- Applications towards smart classrooms should be in the Material Development contented courses, which are for candidates of teachers.
- Individuals from different geographies should take place inside the smart classrooms in distance education.
- Smart classrooms should show parallelism with artificial intelligence applications.
- Smart classroom applications should be demoted to primary schools from high educational institutions considering the installation type.

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