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A BLENDED LEARNING APPROACH TO MOTIVATION OF MEDICAL STUDENTS TAKING ANATOMY CLASS

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ABSTRACT

The present study aims to put forward environment oriented views, levels of satisfaction and perceptions of the students taking the anatomy class in the Faculty of Medicine in a blended learning environment where they can ask questions to the tutor together with cadaver dissection shootings and related 3-D images that they can use during the hours of independent study so that they can further benefit from the cadaver training. The participants of the present study is comprised of a randomized group out of 213 students of Semester II, who were selected from the students registered for the 2012-2013 Academic Year in Faculty of Medicine, Kocaeli University and divided into four groups for the anatomy laboratory class. The research method used is a quasi-experimental design, in which control and experimental groups were involved and pretest-posttest measurements were performed. The results of the study, based on the instructional materials motivation scale, show that a statistically significant difference in favor of the blended learning group was found. The results of the study also indicate that there is no statistically significant difference between the motivation levels of the students involved in the traditional environment, while there is a significant difference between the pretest-posttest results of the motivation scale of those involved in the blended learning environment. As a result, the motivation of the students was increased by ensuring the student-material and student-student interactions through the videos and animations; student-student and student-tutor interactions through the case study discussions.

Key Words: Blended learning, anatomy education, motivation, medical students.

INTRODUCTION

A standard anatomy education aims to help students gain new qualifications at a certain level in terms of knowledge, skills and attitudes. The students are enabled to get only knowledge through the lectures in the -theatres, cadaver projections and the multiple-choice exam models which are today being applied. The studies on cadaver dissections and living human models that would help the students gain skills and partially positive attitude characteristics cannot be carried out sufficiently due to the reasons such as inadequate number of cadavers etc. but the high number of students, lack of technical equipment, infrastructure and tutors (Arman, Cankur, Celik, Ersoy, İçke, Kopuz, Özbek, & Pınar, 2002).

Sayek, Odabaşı and Kiper (2010) have stated that the methods that would support the anatomy education should be used more extensively so that the anatomy education which has an important role in basic medical education can be performed and the related problems can be solved. One of the methods that can be used to solve these problems is the blended learning environments. This method has the advantages of distance education as well as those of face-to-face.

Blended learning in Medicine

The computer-based technologies center plays an important role in the blended learning method (Graham, 2006). According to Ocak (2011), blended learning is used to explain the consistent balance between the web-based technologies and face-to-face education.

The blended learning supports a wide range of learning models such as situated, relational, systematic, simulative and constructivist learning that help to enhance the quality of medical education (Woltering, Herrler, Spitzer, & Spreckelsen, 2009).

The benefits of using the blended learning method while teaching human anatomy are as follows (Pereira, Pleguezuelos, Meri, Molina-Ros, Molina-Toma's, & Masdeu, 2007):

- It makes the subject more attractive.
- It modernizes the teaching methods used to teach traditional human anatomy.
- It improves cross competencies.
- It provides the students with reliable, always-accessible and updateable materials.
- It helps the students retain an appropriate level of information for their professions.
- It increases the academic performance.
- It enhances the communication processes between the tutor-student, student-student and tutor-tutor.
- It facilitates the compliance to the directives of the Bologna Declaration (within the European framework)

As well as the attraction brought by the environment's being new in learning environments that have changed by the technological improvements, the motivation of the learner is also an important factor for increasing success. An individual in e-learning environments may feel him/herself alone since he/she cannot have instant feedbacks, communicate with other students and the tutor and act individually in structuring the knowledge. This may decrease the motivation of the student. In this sense, motivation should be taken into consideration while designing the learning environments.

Benefits of blended learning

The studies show that the use of e-learning environments in medical education motivates the students and enhances the quality of education. The technology effectively integrated into the curriculum is considered to be important by educators for determining both the teaching strategies related to the learning styles and motivation of the students and open teaching goals in accordance with the students' depth and amount of knowledge level (Guo, Katz, & Maitland, 2002). Woltering et al. (2009) , in a similar study, used the problem-based learning method in a blended learning environment that was applied to the third grade students of faculty of medicine and found that the motivation levels of the students were increasing while there was no change in those of educators. Nicholson, Chalk, Funnell and Daniel (2006) determined that the 3D animations they created in the computer environment selecting one of the anatomy topics positively affected the learning of the students.

More realistic environments can help students be motivated and improve the learning process. On the other hand, it helps to reduce the impact of a tutor's existence, hence it increases flexibility and lessen costs (Woltering et al., 2009).

Motivation

In the present study, the motivational design model of Keller has been used to determine the motivation. According to Keller (2006), motivational design theory is one of the learning design models that can help to improve effective learning systems. Motivational design theory is the process of organizing resources and actions so that changes can be made in motivation. It is systematic and aims at repeatable principles and processes. Motivational design means actions that would make the motivation for learning, strategies, principles and teaching desirable. Its objective is to create an educational environment where time, materials and other resources can be used effectively and efficiently. The design model developed by Keller (2006)

includes four motivation variables: Attention, Relevance, Confidence, Satisfaction. The model is known as ARCS model.

The variables and the sub-concepts used to characterize the human motivation in ARCS model are described as follows:

1. **Attention:** In ARCS model of Keller's (1987), the first step of motivation and the prerequisite of learning is grabbing the attention and sustaining it. Attention can be gained in three ways:
- **Perceptual stimulus:** Novel, Surprising, incongruous and uncertain events are used to grab attention.
- **Inquiry-based stimulus:** To arouse curiosity by posing challenging questions or problems to be solved.
- **Variability:** Using different materials, trying various methods and using different presentation techniques during teaching enable to maintain the attention of students.
2. **Relevance:** If their question "How would I benefit from this?" is left unanswered, the students will have less interest in the subject. A concrete language style and examples that students are familiar with can be used to increase their motivation.
3. **Confidence:** The aim of the confidence step is to help students do their best by making them believe that they will be successful. If the students think that they will fail, their motivation will decrease. Providing challenge level would have a significant success.
4. **Satisfaction:** It is necessary to make the students feel that they will accomplish their research and applications in order to increase their motivation. According to the reinforcement theory, well-defined tasks and awards and timing them with an appropriate reinforcement make students more motivated. However, the extrinsic rewards under control of the tutor do not always have positive results. There are proper ways for using extrinsic rewards in learning case and stimulating intrinsic rewards.

Importance of motivation in medicine education

Motivation plays a key role in meaningful learning. Students' motivation should be taken into consideration so that they could become perfect doctors. According to Brissette and Howes (2010), an educational environment where student's autonomy is supported and the sense of efficacy and relativity needs are considered and the related assessment methods help to increase student's motivation. Motivating the student is one of the most important tasks of a tutor.

According to Kusurkar, Ten Cate, Van Asperen and Croiset (2011), motivation, as an independent variable, affects learning and studying behavior, academic performance, choice of a specialty in medical education and intention to continue medical studies. The current studies in medical education state that learning environments play an important role in motivation; however, the dependent variable on motivation is being researched less and more studies are required to be conducted in this field.

In the present study, the effect of the blended learning environment prepared for the anatomy class on the motivation levels of the students are tried to be determined.

Purpose

The anatomy course included in the medical education at undergraduate level is the basis of medical education and must be well-known in all classes and fields of specialization. One of the best methods to learn human anatomy is to perform cadaver dissection. According to the tutors of the anatomy class, 6-10 students per cadaver should be in the cadaver dissection classes so that they can be effective and efficient. This number could be increased to 20 depending on the operation. However, this number is 30 or even more in the Faculty of Medicine, Kocaeli University due to the insufficient number of cadavers and tutors. Therefore, the students cannot analyze the cadaver in detail and the tutor-student communication decreases. In addition, the students do not have the chance to repeat the cadaver laboratory class.

In solving the problems encountered in the anatomy education, the use of online media with face-to-face learning enables the students to have access to the materials at will, to plan and lead their own learning, to assess themselves, furthermore it helps the student-student and student-tutor communication to increase

owing to forums and the education gets better in quality and grabs more attraction thanks to the images used (Deveci, Ocak, & Çolak, 2012).

The present study aims to determine the level of motivation of students regarding the class prepared in a web environment in accordance with the blended learning environment. The sub-purposes developed to fulfill the aim of the study are as follows:

1. What is the general motivation level of the students in the blended learning environment in faculty of medicine?
2. What is the level of motivation of the students regarding sub-dimensions of attention, confidence, relevance and satisfaction in the blended learning environment?

For that purpose, a web environment has been created, which includes cadaver dissection shoots and related 3-D images that students taking the anatomy class in the Faculty of Medicine can use during the hours of independent study and where students can ask some questions to the tutor, so that they can further benefit from the cadaver training.

METHOD

Context

The anatomy class is compulsory in the first and second grade of the Faculty of Medicine, Kocaeli University and the number of students taking it is 240 and over. The students are divided into four groups to attend the cadaver laboratory class. Moreover, the number of cadaver used for the anatomy class is maximum 1 or 2 and it is quite insufficient when compared to the number of students. There are 4 tutors for this class and the number of students per tutor is above the average in Turkey. While the average number of students per tutor teaching the basic sciences in the faculties of medicine is 22.57, it is 4.45 for clinical sciences (Sayek, Odabaşı, & Kiper, 2010).

Besides, students can take the cadaver training for each subject only once. Those who are not able to understand the subject do not have another chance to repeat it in the laboratory. If the student does not attend the laboratory class, he/she must take making up class and get prepared for it in advance. The students who cannot answer the questions in the making up class are not allowed to attend the practical exam.

Participants

The target population of the present study is comprised of the students of the Faculty of Medicine, Kocaeli University, while the sample is a group randomly selected out of 213 students of Semester II registered for the 2012-2013 Academic Year, who were divided into four groups for the anatomy laboratory class by the management of the Faculty of Medicine. The students in this group were sorted into categories as with low scores (score interval of 22.1-36.3), medium scores (score interval of 37.8-44.8) and high scores (score interval of 45.4-59.1) based on the total scores they got from the previous two board exams of the anatomy class and two groups each with 24 students were created by assigning equal number of students from each score interval into the experimental and control group through random assignment method.

Research method

The classes are performed annually and in 40-day boards in the faculty of medicine. The subjects in the anatomy class are segmented as per anatomical systems in the body. The website prepared for this study according to teaching process involves the purpose of the class, the user entry and user guide, lecturing (with images and animations), two 3D animations, the movies of the cadaver dissections performed in the anatomy laboratory about the "Digestion System and Metabolism" on its main page, problems that the students can discuss with each other or with the tutor in case discussion part and the contact page. The class subjects were designed based on multi-media design principles of Mayer. The students can have access to the system both in and out of the university campus whenever they want. The class model prepared within the context of anatomy class is given in Figure 1.

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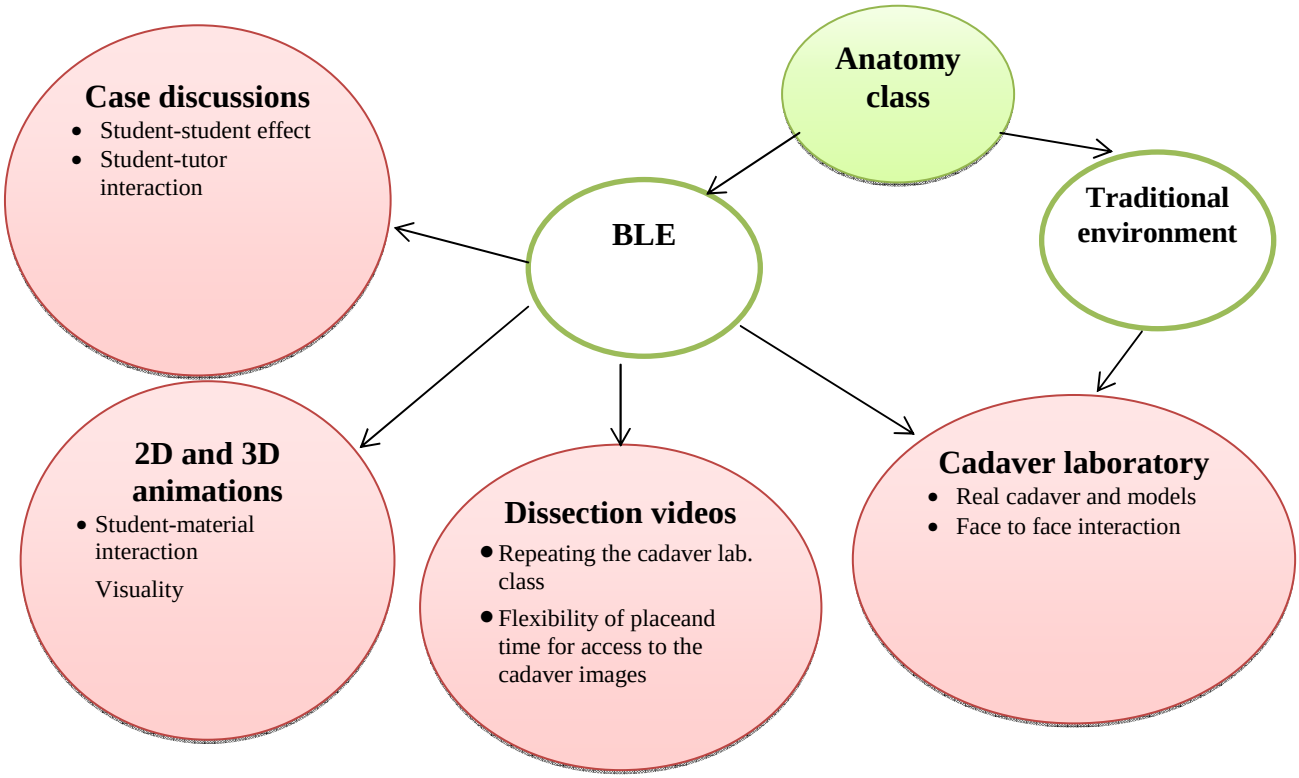

Figure 1: Research model

The study includes some subjects stated in the "digestion system and metabolism" board that lasts 4 weeks. 7 hours of 12-hour anatomy class is performed face to face and 5 hours is online. A great majority of the theoretical lessons are carried out online, while the practical ones are taught face-to-face in the anatomy laboratory. During design process, the learning attainments for each subject, the environment in which these attainments would be provided, the methods and techniques to be used and the reasons why these environments should be used were determined and the study was completed in 4 weeks.

The videos in which the tutor was lecturing in the blended learning environment were shot together with real cadavers, organs and models in the laboratory the students use for the cadaver dissection. The 2D images seen on the website and the 3D animations provided by outsourcing were obtained from the Primal Pictures platform. Figure 2 shows a model of subject with 2D animation which is on the website; Figure 3 shows a subject model that has the images of real cadaver parts (ps).

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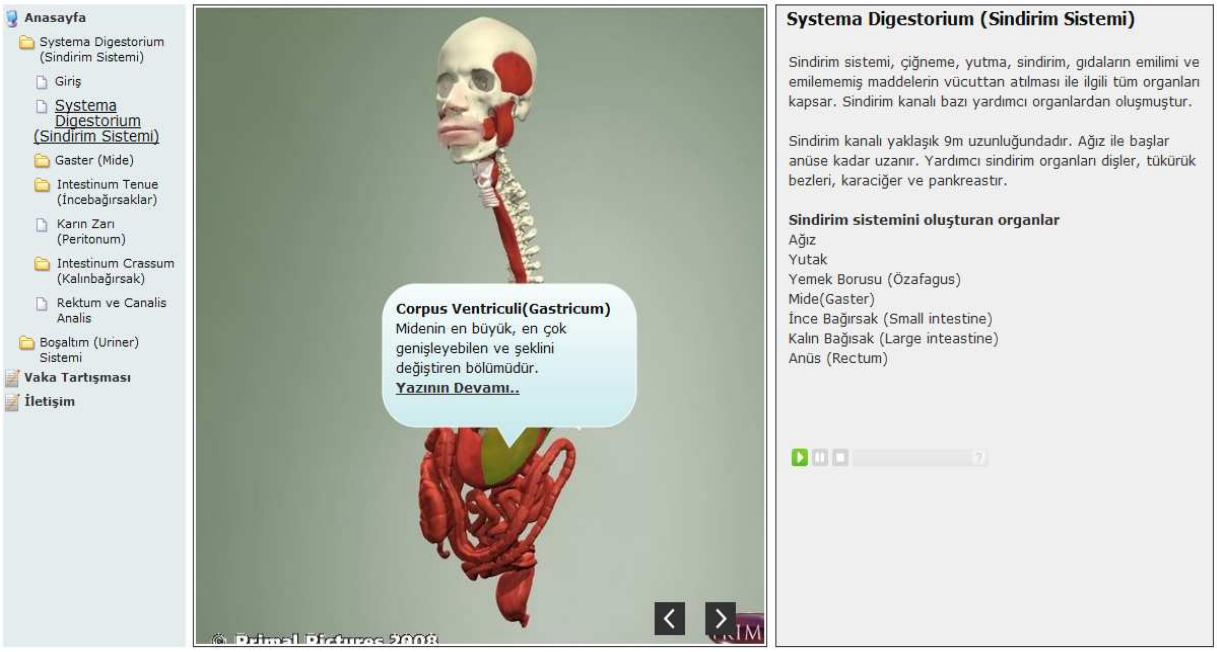

Figure 2: A subject model including a 2D animation on the website

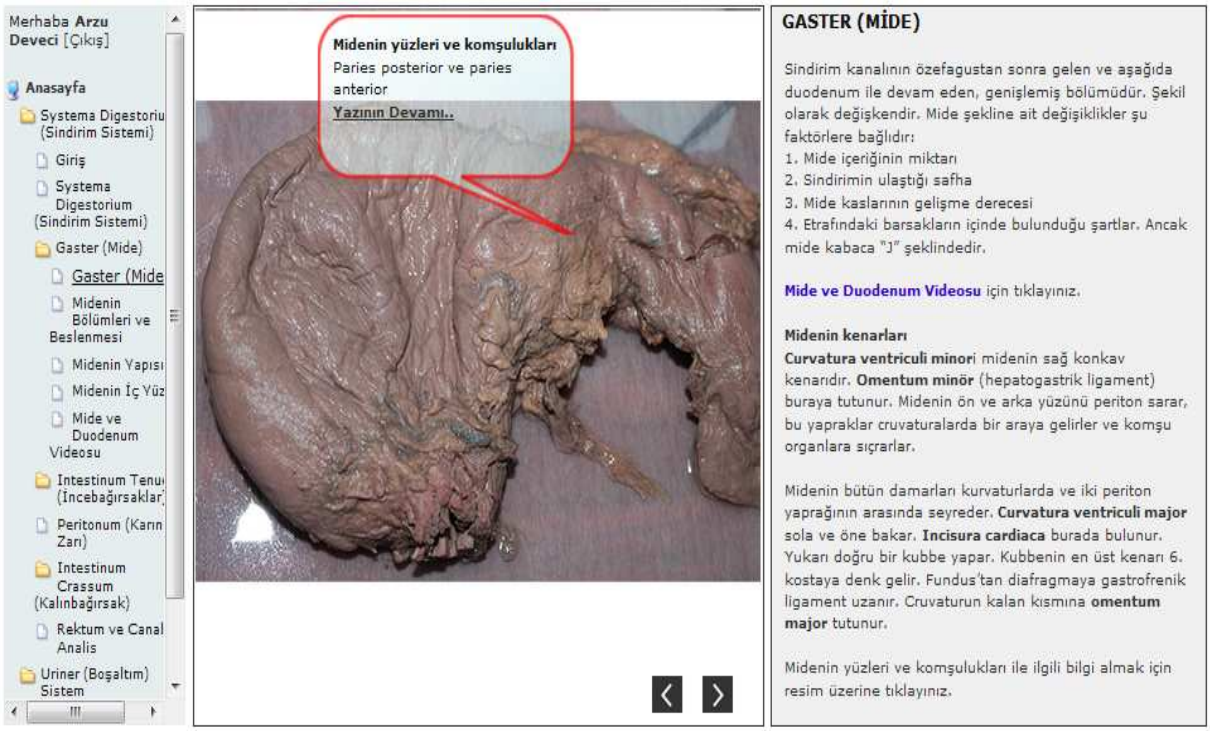

Figure 3. A subject model with images of the real cadaver parts (ps) on the website.

Data collection method

In the present study, a qualitative study was carried out and a quasi-experimental design with pretest, posttest and control groups was used in order to determine the motivation levels of the students. The reason of carrying out a quasi-experimental study was that the independent variables, the effects of which were analyzed, could not be manipulated and other variables could not be brought under control. Therefore, only situational relations have been introduced.

Data collection tools

"Instructional Material Motivational Scale" (IMMS) developed by M. Keller and adapted into Turkish by Jale Balaban was used to determine the motivation levels of the students at the beginning and end of the study. IMMS has a 5 point likert scale as (1) Incorrect, (2) Slightly correct, (3) Moderately correct, (4) Highly correct and (5) Very correct. A reliability study was carried out among 248 students in the faculty of medicine and it was found that Cronbach α=.759.

The Kaiser-Meyer-Olkin (KMO) test was applied in order to determine whether the data collected were appropriate for the factor analysis. The value obtained from the KMO test is regarded as perfect as it closes to 1 and unacceptable if below 0.50 (Tavşancıl, 2002). The KMO value was found to be 0.851 as a result of the analysis in the present study. This value indicates that the sample size is appropriate to perform a factor analysis. The structure validation of the scale was analyzed by the Exploratory Factor Analysis method. At the end of the analysis, having omitted 16 items from the questionnaire, a Turkish form was prepared to include 20 items under a four-factor structure. 13 of the questions have positive arguments, while 7 of them have negative arguments.

Data analysis

SPSS 20 package program was used in analyzing the data. The values of arithmetic average ($\overline{x}$) and standard deviation (ss) received from each test were calculated. According to the analysis results obtained, the students disordering the normal distribution were excluded, so the groups were equalized. The intragroup differences of the pretest and posttest were analyzed at the significance level of 0.05 using dependent t-test, while the differences between pretest and posttest groups were analyzed at the same level using independent t-test.

FINDINGS

The data obtained with IMMS were analyzed based on the sub-dimensions of relevance, satisfaction, attention and confidence in the questionnaire. The matched sample t-test was used to test the intra-group difference, while unrelated sample t-test was used for inter-groups difference. The answers of the students to negative questions during the analysis were recoded and changed into positive answers.

When The Table 1 analyzed, according to the matched group t-test results, the motivation level of the students having been educated in the blended learning environment appeared to increase significantly in general, t(23) =3.04 kg, p< .01. While the average motivation score of the students before blended learning method was $\overline{x}$=61.9, it came up to $\overline{x}$=68.9 after the blended learning practices. This finding shows that the blended learning environment has an important effect on increasing the motivation of students. When the sub-dimensions of the scale examined, a statistically significant increase was found in the attention factor t(23)=2.14, p<.05, confidence factor t(23)=3.9, p<.01 and relevance factor t(23)=2.7, p<.05. While the average attention point of the students before the study was $\overline{x}$=22.4, it increased to 25.8 after the practice, the confidence point increased from $\overline{x}$=7.2, to $\overline{x}$= 9.3 and the relevance point increased from $\overline{x}$=13.3 to 15.8. However, no significant difference was found in the satisfaction factor, t(23) =.23, p.>05. These findings indicate that the average attention and confidence levels of the students increased in the blended learning environment, and the practice is applicable for students.

Table 1:The t-test results of the IMMS pretest and posttest average scores of the students taking a class in the blended learning environment

	$\overline{X}$	N	S.D	T	Df	P
Pretest_attention	22.38	24	7.11	-2.13	23	.04
Posttest_attention	25.79	24	5.44			
Pretest_confidence	7.17	24	3.33	-3.92	23	.00
Posttest_confidence	9.25	24	3.28			
Pretest_relevance	13.92	24	3.75	-2.72	23	.01
Posttest_relevance	15.83	24	3.37			
Pretest_satisfaction	18.21	24	4.30	.22	23	.82
Posttest_satisfaction	18.04	24	3.68			
Pretest_total	61.88	24	12.64	-3.04	23	.00
Posttest_total	68.92	24	8.94			

In Table 2, according to the matched group t-test results, there was not any significant change in the motivation level of the students taking a class in the traditional environment, t(23) =.33, p.>05. While the average pretest score of the students was $\overline{X}$=63.3, the average posttest score was found to be $\overline{X}$=62.8. Given the sub-factors, a statistically significant difference in favor of the pretest was found in the attention dimension, t(23) =2.25, p.<05. While the average score of the attention factor was $\overline{X}$=24.9 in the pretest results, it decreased to $\overline{X}$=21.96 in posttest. This result shows that the materials used in the class are perceived as grabbing less attention in time. No significant difference was found between the average pretest and posttest scores in the confidence (t(23) =1.6, p.>05), relevance (t(23) =1.9, p.>05) and satisfaction (t(23) =.11, p.>05) sub-dimensions.

Table 2: The t-test results of the IMMS pretest and posttest average scores of the students taking a class in the traditional environment

	$\overline{X}$	N	S.D	t	df	P
Pretest_attention	24.88	24	8.06	2.24	23	.03
Posttest_attention	21.96	24	6.14			
Pretest_confidence	7.04	24	3.52	-1.64	23	.11
Posttest_confidence	8.42	24	3.41			
Pretest_relevance	15.67	24	3.07	1.91	23	.06
Posttest_relevance	14.38	24	3.25			
Pretest_satisfaction	18.13	24	4.28	.10	23	.91
Posttest_satisfaction	18.04	24	3.31			
Pretest_total	63.63	24	11.62	.33	23	.74
Posttest_total	62.79	24	10.68			

Given the IMMS results of the students, (Table 3), while no statistically significant difference was found between the motivation levels of the students taking classes in the traditional and blended learning environments at the beginning of the practice, (t(46) =.49, p.>05), there seemed to be a significant difference according to the scale results repeated at the end of the practice (t(46) =2.15, p.<05). While the average score of the students taking classes in the traditional environment was found to be $\overline{X}$=63.6 as per the pretest result, the average score of the students taking classes in the blended learning environment was found to be $\overline{X}$=61.9. The average score of the students taking classes in the traditional learning environment was found to be $\overline{X}$=62.8 as per the posttest result, the average score of the students taking classes in the blended learning environment was found to be x=68.9. This result proves that the teaching method applied has a significant effect on the motivation levels of the students in the anatomy class. In one of the studies supporting this finding in the literature, in which the traditional lecturing, video and computer-assisted teachings were compared using the IMMS scale of Keller with participation of a group of people who were just employed at the medical center then, Rodgers and Withrow-Thorton (2005) found a statistically significant result in favor of the computer-assisted teaching. Moreover, Chen and Chen (2012) used the IMMS scale in the interactive video-based education they implemented and found a statistically significant difference in favor of video-based education between two groups.

Table 3: The t-test results of the IMMS pretest and posttest average scores of the students according to the learning environment

	Method	N	$\overline{X}$	S.D	df	t	P
Pretest_total	Traditional	24	63.63	11.62	46	.49	.62
	BLE	24	61.88	12.65			
Posttest_total	Traditional	24	62.79	10.68	46	-2.15	.03
	BLE	24	68.92	8.94			

Given the pretest and posttest results of the attention sub-dimension of IMMS (Table 4), while no statistically significant difference was found between the attention levels of the students taking classes in the traditional and blended learning environments at the beginning of the practice, (t(46) =1.14, p.>05), a significant difference was found between the attention levels of the students in the scale results repeated at the end of the practice (t(46) =2.28, p.<05). While the average score of the students taking classes in the traditional environment was found to be $\overline{X}$=28.9 for the attention sub-dimension, the average score of the students taking classes in the blended learning environment was found to be $\overline{X}$=22.4. However as per the posttest result, the average score of the students taking classes in the traditional learning environment was found to be $\overline{X}$=21.96, the average score of the students taking classes in the blended learning environment was found to be $\overline{X}$=25.8. This result shows that the materials used in the teaching method applied have a significant effect on attention. In one of the studies supporting that finding, Çolakoğlu and Akdemir (2010) found a significant difference between the experimental and control groups in favor of the experimental group in the blended learning environment they prepared according to the ARCS model and in the attention sub-dimension of the study by Chen and Chen (2012). In another study, Baturay, Daloğlu and Yıldırım (2010) found that the attention levels of the students in the blended learning environment were above average for language teaching they implemented.

Table 4: T-test results of the pretest and posttest average scores for the attention sub-dimension of IMMS

	Method	N	$\overline{X}$	S.D	df	T	P
Pretest_attention	Traditional	24	24.88	8.06	46	1.13	.26
	BLE	24	22.38	7.11			
Posttest_attention	Traditional	24	21.96	6.14	46	-2.28	.02
	BLE	24	25.79	5.44			

Given the pretest and posttest results of the relevance sub-dimension of IMMS (Table 5), no statistically significant difference was found between the relevance levels of the students taking classes in the traditional and blended learning environment both at the beginning (t(46) =1.77, p.>05) and end t(46) =1.53, p.>05) of the practice. While the average score of the students taking classes in the traditional environment was found to be $\overline{X}$=15.7 for the relevance sub-dimension as per the pretest result, that of the students taking classes in the blended learning environment was found to be $\overline{X}$=13.9. However, as per the posttest result, the average score of the students taking classes in the traditional learning environment was found to be $\overline{X}$=14.4, whereas that of the students taking classes in the blended learning environment was found to be $\overline{X}$=15.8. This result shows that applied teaching method has a significant effect on the relevance. On the other hand, Çolakoğlu and Akdemir (2010) found a statistically significant difference between the experimental and control groups in favor of the experimental group in the blended learning environment they prepared according to the ARCS model and in the relevance sub-dimension of the study by Chen and Chen (2012).

Table 5: T-test results of the pretest and posttest average scores for the relevance sub-dimension of IMMS

	Method	N	$\overline{X}$	S.D	df	T	P
Pretest_relevance	Traditional	24	15.67	3.07	46	1.76	.08
	BLE	24	13.92	3.75			
Posttest_ relevance	Traditional	24	14.38	3.25	46	-1.52	.13
	BLE	24	15.83	3.37			

Given the pretest and posttest results of the confidence sub-dimension of IMMS(Table 6), no statistically significant difference was found between the confidence levels of the students taking classes in the traditional and blended learning environment both at the beginning (t(46) =.12, p.>05) and end t(46) =.862, p.>05) of the practice. While the average score of the students taking classes in the traditional environment was found to be $\overline{X}$=7.04 for the confidence sub-dimension as per the pretest result, the average score of the students taking classes in the blended learning environment was found to be $\overline{X}$=7.17.However, the average score of the students taking classes in the traditional learning environment was found to be $\overline{X}$=8.42 as per the result of the posttest, the average score of the students taking classes in the blended learning environment was found to be $\overline{X}$=9.25. This result shows that the materials used in the teaching method applied do not have a statistically significant effect on confidence. In one of the studies supporting this result and performed as an online learning Huett, Moller, Young, Bray and Huett (2008) found no statistically significant difference between the experimental and control groups in the confidence sub-dimension of the ARCS model. On the other hand, Çolakoğlu and Akdemir (2010) and Chen and Chen (2012) found a significant difference in favor of the experimental group between the experimental and control group in the sub-dimension of confidence.

Table 6: T-test results of the pretest and posttest average scores for the confidence sub-dimension of IMMS

	Method	N	$\bar{x}$	S.S	df	t	P
Pretest_confidence	Traditional	24	7.04	3.52	46	-.12	.90
	BLE	24	7.17	3.33			
Posttest_confidence	Traditional	24	8.42	3.41	46	-.86	.39
	BLE	24	9.25	3.28			

Given the pretest and posttest results of the satisfaction sub-dimension of IMMS (Table 7), no statistically significant difference was found between the satisfaction levels of the students taking classes in the traditional and blended learning environment both at the beginning (t(46) =.06, p.>05) and end t(46) =.0, p.>05) of the practice. While the average score of the students taking classes in the traditional environment was found to be $\bar{x}$=18.1 for the satisfaction sub-dimension as per the pretest result, the average score of the students taking classes in the blended learning environment was found to be $\bar{x}$=18.2. The average score of the students taking classes in the traditional learning environment was found to be $\bar{x}$=18 as a result of the posttest, whereas the average score of the students taking classes in the blended learning environment was found to be $\bar{x}$=18. This result shows that the materials used in the teaching method applied do not have a significant effect on satisfaction. On the other hand, while Çolakoğlu and Akdemir and (2010) and Chen and Chen (2012) found a statistically significant difference between the experimental and control group in favor of the experimental group in the sub-dimension of satisfaction, Baturay, Daloğlu and Yıldırım (2010) found that the satisfaction levels of the students in the blended learning environment were above average for language teaching they implemented.

Table 7: T-test results of the pretest and posttest average scores for the satisfaction sub-dimension of IMMS

	Method	N	$\bar{x}$	S.D	Df	T	P
Pretest_satisfaction	Traditional	24	18.13	4.28	46	-.06	.94
	BLE	24	18.21	4.30			
Endtest_satisfaction	Traditional	24	18.04	3.31	46	.00	1.00
	BLE	24	18.04	3.68			

DISCUSSION AND RESULTS

While the pretest results of the "instructional materials motivational scale" for both students in blended learning and traditional anatomy class in the faculty of medicine are the same, there is a statistically significant difference in favor of the blended learning group in the posttest result.

Given the sub-dimensions, while a significant difference was found for "attention" sub-dimension, there was not any difference for the sub-dimensions of "confidence", "satisfaction" and "relevance"; furthermore, the average score of the students in the BLE increased, but the average score of attention, relevance and satisfaction sub-dimensions of the students in the traditional environment decreased.

A statistically significant difference was found between the pretest and posttest results of the motivational scale of the students included in the blended learning environment, while no significant difference was found in the "satisfaction" sub-dimension. A statistically significant difference was found in the "attention", "confidence" and "relevance" sub-dimensions between the pretest and posttest of the motivational scales of the blended learning group.

Based on these results, it is possible to say that the materials in a web environment grabbed the attention of the students and created an appropriate place for their learning. This result is supported by the studies of

Baturay, Daloğlu and Yıldırım (2010), Chen and Chen (2012), Çolakoğlu and Akdemir (2010). The reasons of finding no significant difference in satisfaction may be that the medical students have not used the system before and have not had enough time to understand the system due to short time of practice, the lesson is challenging and the students are tired of the class in time. The increased motivation level in general corresponds with the results obtained from the online anatomy laboratory class created by Guo and et al. (2002) under the kinesiology class concept. Also, Boudinot and Bradley (2001) created an online learning environment in order to facilitate the anatomy teaching and stated that this environment enhanced the motivation of the students.

The designed environment in this study has increased the motivation of the medical students in the anatomy class in general. Motivation increase is an important component of the teaching environments in terms of promoting academic success. According to Woltering et al. (2009), the use of blended learning environments in medical education enhances the motivation, satisfaction and learning attainments of students.

Consequently, the blended learning environment prepared for the anatomy class provided Turkish web material assisstance to students. The chance to access and reuse the materials whenever and wherever the students wanted and to communicate with the tutor out of the class hours and analyze the human body in 3D with the animations used increased the students' motivation levels. Given these results, the reasons why there is no significant change in the satisfaction levels of the students based on the motivation questionnaire can be researched. Similar studies can be carried out, which includes a larger group of students in the basic classes in medical education, different subjects together with qualitative and quantitative data.

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