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Research Article

The Impact of the Contents of Educational Informatics Network on Classroom Participation of Students in Teaching the Subject of the Musculoskeletal System

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Abstract

The purpose of this research is to determine the impact of the contents of Educational Informatics Network on participation of students in teaching the subject of musculoskeletal system. In the study, the quasi-experimental design is preferred. Furthermore, the opinions of the students are given a place which added qualitative dimension to the study. The data set used in the study was gathered from the Classroom Participation Inventory. In the analysis of the data, descriptive statistical techniques, normality analyses and independent t-test were used. At the end of the study, a significant difference was found in favor of the experimental group. Considering mean scores the experimental group for affective participation, cognitive participation and non-participating were more than the ones of the control group. According to students' views, it was determined that the EIN contents are beneficial and helpful for learning terms better, and the classes are enjoyable.

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Introduction

Necessity and demand for individual skills increase exponentially due to the rapid rise of the network and information era of 21th century. Therefore, the roles and the skills that are expected from the new generation become different. Raising generations who could meet the need and skills of the century in order to keep up with the era in which we live is indispensable. Considering the fact that the most effective way of acquiring the skills of 21th century is education, a great number of developed and developing countries started racing in order to shape their educational policy in the direction of the era (Eurydice, 2011; MoNE, 2018; NCTM, 2004). The most great reason of this situation is the fact that education is the most important notion which all of the developed and developing countries dwell upon in order to reach their aims. Another reason is that, in our world which always changes and progresses, it is accepted as a goal that education and training need to be adequate for the

needs of the era (Ateş, Çerçi & Derman, 2015). Because with each passing day, technology becomes an indispensable part of the lives of individuals, especially in education (Bolat, 2016; Kaya, 2018). Especially the technological progresses, which occur on a global scale, make science and mathematics education the most important in all fields of education and indicate that science occupies a rather important position for development and progress of the societies (Rivard & Straw 2000; SCINTEX, 2015). Our country's science curriculum was revolutionized in this direction, technology was made a part of education. So much so that the statement "The scope of digital competence includes safe and critical use of the information and communication technologies for daily life and communication" became the fundamental philosophy of the curricula (MoNE, 2018). Especially the increase in the interest of the students in technological tools (computer, tablet, mobile phone etc.) due to the technological activities which improve continuously caused new approaches to occur in learning and teaching activities and made it compulsory to supply the e-learning opportunities (MoNE, 2019a). In this context, the Movement of Enhancing Opportunities and Improving Technology (FATIH) Project was planned to comprise middle school, elementary and preschool education throughout the country by The Ministry of National Education (MoNE) in 2010 in order to make content-rich education with the same quality available to every student equally.

The FATIH Project is thought to prominent with the aspect of being the largest project that combines technology and education in the world. This project consisted of five main sections; to modernize hardware and software infrastructures of schools, to provide and use e-content, make curricula suitable for the use of Information and Communication Technologies (ICT) actively, to improve and encourage teachers who are the practitioners of the project in the field with the in service trainings, to provide the use of ICT which is conscious, safe, utilizable, and evaluable (Kana & Aydın, 2007, MoNE, 2019b). One of the most important aspects of the project is that it was put into service for the use of all the members in the country without any restrictions in time or space. The ultimate goal of the project was planned in order to make every member benefit from the opportunities equally, make assessment and evaluation more reliable, and to increase the quality of education completely (Çakmak & Taşkıran, 2017; Eryılmaz & Uluyol, 2015; Kana & Aydın, 2017; MoNE, 2019b). In order to reach these goals, the FATIH Project adopted accessibility, productivity, equality, measurability, and quality as principles (MoNE, 2019b). With this

aspect, the FATIH Project is directly related to the skills of 21th century; knowledge, media, and technology (Eryılmaz & Uluyol, 2015).

One of the most important pillars of the FATIH Project is without a doubt that e-content materials are put into service via Educational Informatics Network (EIN). EIN which is an online, social education platform was created by the Directorate General for Innovation and Education Technologies within the scope of "providing and management of e-content" which is one of the basal components of FATIH Project (Çakmak & Taşkıran, 2017). EIN, which is the window of the students to the modern world is an internet based, modern education platform in which all members interact with one another (MoNE, 2019b). E-contents uploaded to EIN by MoNE are available for all of the members. Moreover, this learning platform to which numerous learning platforms contribute with their learning materials enables teachers to participate. All of these opportunities are transported to classes by means of interactive whiteboards. The basal goals of EIN are; to provide rich and educational content, to generalize informatics culture, to have it used in education, to meet the needs for content, to exchange information with social network topology, to contribute to lessons, to shape education, and to produce knowledge from knowledge (MoNE, 2019b). In the content of teaching science of EIN, there are a great number of rich education materials such as lecture videos, exercises, 3D animations, visual materials. In addition to these, educational contents of the major area courses which could be used by both students and teachers are given a place. There are written, vocal, and pictorial resources along with the video-based courses on EIN. Uploading files and providing a digital domain, organizing competitions, courses for various levels, debate platform, questionnaire forms, level diagrams for students, message box, vote section, activities page, announcement display, and the opportunity to share for the users are some of the powerful aspects of EIN system. EIN performs as a digital roof by electronically bringing elements together which could contribute to education (Çakmak & Taşkıran, 2017; Kaya, 2018). Moreover, EIN improves itself continuously in order to meet the need of electronic educational content in our education system, organizes the functions effectively to provide content (URL-1).

When the literature is analyzed, it compels attention that there is a limited number of studies about EIN education platform since it is a new education platform. It was indicated that the use of interactive whiteboard increases the success of the students in educating science and the science courses in which interactive whiteboards are used are more

enjoyable, the students learn better and it increases the participation (Özkan, 2012). It was concluded in the study that attempted to determine the efficiency of EIN according to the opinions of 73 middle school students by Kana and Aydin (2007) that there is a relevancy between the use of EIN and the academic achievement and the success of the students who use EIN is affected. It was concluded that the students in the experimental group were academically more successful than the ones in the control group after applying the EIN platform contents (Ünal & Hastürk, 2018). One of the purposes of the study is to develop an educational game which could be applied through EIN and to determine the impact of the developed activity "salt-ice game" on science academic success of the students and their attitude towards science. At the end of the study, it was conducted that the "salt-ice game" activity developed with the purpose of exercise improves the academic achievement of the students and their attitude towards science (Tolan-Sürbahanlı, 2018). Aydoğan (2016) reached a conclusion that education supported with EIN causes a significant difference on the attitude of the students after conducting an experimental study to determine the notion faults of fourth graders about fusion-dissolution and heat-temperature. At the end of the quasi-experimental study conducted by Kendirli (2017), it was determined that there is a significant difference for the benefit of the post-test scores in the science interest scale between the pre-test and post-test mean scores of the female and male students in the experimental group. In addition to these studies it was indicated that EIN contents are important means in order to improve students' success by studies of other fields. At the end of the study, it was determined that the scores of the experimental group supported with EIN were higher than the ones of the control group (Açıkgöz, 2018). On the other hand, when the other studies for EIN in the literature were researched, it was concluded that several of them consisted of opinions of students and teachers about the application (Alabay, 2015; Çakmak & Taşkıran, 2017; Kana & Aydın, 2017; Kaya, 2018; Tutar, 2015). In the studies conducted, it was indicated that both teachers and students maintain a positive attitude towards EIN contents and the contents are useful and provides convenience for the learning and teaching process (Çakmak & Taşkıran, 2017; Timur, Yılmaz & İşseven, 2017; Tutar, 2015).

In this day and age in which teaching science gains importance gradually in the whole world, studies and approaches regarding how to teach science more precisely are being performed and conducted. Despite these positive attempts the results of the studies

conducted indicate that the motivation, attitude, interest, self-sufficiency, metacognitive awareness, and success of students in science are lower compared to other courses (OECD, 2016; TIMSS, 2016). Along with the fact that there are numerous basal reasons for this situation, the abundance of the abstract concepts in science is demonstrated as one of the primary reasons (Aktas, 2015; Azar, 2001). Therefore, the educational activities which make students active in the process gain an important aspect in increasing the interest of students in science, making them participate in courses actively and providing effective and permanent learning (Tolan-Sürbahanlı, 2018). It is known that the reforms devoted to science teaching foresee the students' active participating in order to realize effective and permanent learning and increase the efficiency compared to conventional techniques (Demirci, 2003; Kartal, 2007; Kiras, 2013; Syh-Jong, 2007). Especially creating an EIN content supported learning environment that enables students to participate may have positive impact on students' success in science. In this direction, the purpose of this study is to determine the impact of the contents of Educational Informatics Network on participation of students in teaching the subject of musculoskeletal system.

Methodology

The Model of Study

In the study where the impact of the EIN contents on participation of students in teaching the subject of musculoskeletal system is examined, a quasi-experimental design which is one of the quantitative research methods is used. Quasi-experimental studies are used as an important design when there is no random assignment (Karasar, 2015). Within this framework, six classes in total were informed where science teachers lecture. The procedure started with the classes that opted to participate in the study. These students were informed about the EIN platform and the process of the study in detail. In consequence of the pre-informing work, one of the classes where there are students who have the equipment and physical substructure is chosen as the experimental group and one is chosen as the control group. There are 30 students in the experimental group and 30 in the control group. The students in the control group were instructed with the presentation-based approaches. The teacher gave the lecture about musculoskeletal system with the direct instruction method. In the meantime, students took notes, did the exercises in their textbooks, looked for the answers for the questions asked, and finished the classes with the summary of the subject

by the teacher. The courses for the experimental group are instructed through EIN platform. The students watched the videos about the musculoskeletal system, took notes, and completed the process with lecturing, screening test, animation, and study questions. In addition to these, opinions of the students were also given a place in the study which also added a qualitative dimension. In this direction, the students were posed questions about the EIN contents, whichever they liked and whichever they disliked, the impacts of the science lecture, and the parts which attract attention in the contents. A pre-test was conducted for these two groups and it was determined that there was no significant difference between these two groups.

Study Group

The study group of the research consists of 60 sixth graders (30 experimental, 30 control) who study in a state school in the winter semestre of 2019-2020 year. 46.7% (n=28) of the students are female and 53.3% (n=32) of them are male. There are 12 female and 18 male students in the experimental group and 16 female and 14 male students in the control group. Since there was no significant difference between the students' pre-test scores acquired from the participation inventory, the experimental and the control group acknowledged equal.

Data Collection Tool

In order to determine the levels of the participation in teaching musculoskeletal system Participation Inventory, developed by Wang, Bergin, and Bergin (2014) and adapted to Turkish people by Sever (2014) was used. Participation inventory consists of 23 Likerts items and 5 open-ended items. On the Affective Participation of the assessment instrument are 6 items, on the Behavioral Participation (obedience/submission) there are 4 items, on the Behavioral Participation (participation in courses) there are 3 items, on the Cognitive Participation there are 7 items, and on the Non-participation there are 3 items. The internal consistency measures of Cronbach's alpha coefficients were calculated as .87, .82, .74, .89, and .69 respectively. Within the scope of the study the internal consistency parameter was tested and it was determined that the reliability of measurements were .76, .73, .69, .79, and .65 respectively. In this context, it could be observed that the scores the students get from the test provide reliable results (Can, 2016). On the other hand, it was determined that compliance indices acquired as a result of confirmatory factor analysis for triple factorial structure of the scale corresponds to a perfect fit (x^2/sd=1.92, RMSEA=.06, AGFI=.81,

RMR=.06, NNFI=.97, CFI=.97, NFI=.95, IFI=.97, SRMR=.09). The example items of the scale which is like five point Likert scale are as follows: (1) I feel happy in this course. (2) I question how qualified my thoughts or activities are during class activities.

Analysis of the Data

While analyzing the data set used in the study, descriptive statistical techniques, normality analyses, independent sample t-test, Mann-Whitney U and Wilcoxon Signed Rank test were used. In order to increase the reliability of the data set it was suggested that variance equation and kurtosis and skewness rates should be analyzed as well (George & Mallery, 2003). Kurtosis and skewness rates which are near 0 within ±1.5 show that there is a normal distribution (Tabachnick & Fidell, 2013). In this direction, primarily the normality analysis of the data set was performed, the kurtosis and skewness rates of the data were examined. SPSS 22.0 program was used to test the data.

Data Collection Process

The study explains the structures that belong to the musculoskeletal system with examples regarding the subject field of creatures and life [the bone types are given as short, long and flat without mentioning their structures, muscle types are given according to their operation principles (voluntary-non-voluntary) and their fatigue conditions and detailed structure is not mentioned. Appropriate to its achievements, it is conducted for eight class hours. In the study EIN learning platform is used. EIN course content consists of many digital material such as lectures, class videos, virtual experiments, three dimensional visual narrators, interactive practices, interactive activities and subject practices. Additionally, "Vitamin learning software platform" contributes to the EIN course content. In the study conducted with the experimental group, especially EIN user information is controlled and the validity of all students' user information is tested. The most important reason for this process is to enable students to have access to course content from their home environment. In another process, educative course videos of musculoskeletal system were watched with the experimental group students. Questions were directed to students and parts where the students did not understand were watched again in the learning environment. Also, interactive practice questions were directed to students and they were asked to solve them. In the last process, screening tests and subtopic tests which are given to teachers privately are done in online environment.

Besides all these procedures, the digital materials presented in class to the students are also shared within the class group so that they could be watched in houses and the performance of the students were monitored by the supervisor. Feedback was provided to the students for their message, debate, voting, and activity statements and the time they spend on EIN was traced. In addition to these, the academic achievement, studies, shares, and the performance of the students in educational applications about musculoskeletal system could be monitored as well. The students in the experimental group shared and had educational conversations with the supervisor and their classmates. By means of EIN learning module the percentages of the doing the course materials (video, test, exercises) regarding the musculoskeletal system of the experimental group and which parts of the course they understand well or which parts they do not understand well could be monitored. Thus, the parts where the students have difficulty in understanding could be determined and the process could be traced healthily.

Findings

In this part of the study, descriptive rates related to the pre-test results experiment and control group received from the assessment instrument (mean, standard deviation, median, variance, range, skewness and kurtosis multiplier) and the relations between significance levels were mentioned.

Table 1. The descriptive rates of the pre-test acquired from the evaluation instrument of the experiment and the control group

Groups	Descriptive Rates	Affective Participation	Obedience-Submission	Class Participation	Cognitive Participation	Non-Participation
Experimental Group	Mean	3.50	3.42	3.50	3.49	3.71
	Ss	0.60	0.88	0.71	0.68	0.87
	Median	3.60	3.50	3.60	3.50	4.00
	Variance	0.37	0.78	0.51	0.47	0.77
	Range	2.40	3.00	3.00	3.29	3.33
	Skewness	-0.22	0.02	-0.36	-0.29	-0.28
	Kurtosis	-0.82	-0.98	-0.39	1.05	-0.54
Control Group	Mean	3.71	3.73	3.41	3.55	3.76
	Ss	0.75	0.65	0.60	0.49	0.87
	Median	3.80	3.66	3.40	3.50	4.00
	Variance	0.57	0.42	0.36	0.25	0.76
	Range	2.80	2.67	2.40	2.00	3.33
	Skewness	-0.18	0.14	-0.24	0.53	-0.37
	Kurtosis	-1.07	-0.19	-0.31	-0.33	-0.35
Total Number of Students		30	30	30	30	30

When Table 1 is analyzed, it is observed that the rates of skewness and kurtosis acquired from every aspect of the participation inventory of the experimental and the control group vary between -1.07 to 1.05. It could be stated that the factors have a normal distribution since the skewness and kurtosis rates of the data set are in between ±1.5 (Tabachnick & Fidell, 2013). The highest score of the pre-test in the experimental and the control group for the participation inventory was acquired from the non-participation aspect. The lowest mean score in the experimental group was acquired from the obedience-submission aspect and in the control group from the class participation aspect.

When Table 2 is analyzed, every one of the affective, submission/obedience, class participation, cognitive, and non-participation aspects of the participation inventory were observed higher than the significance level ($p>0.05$). Therefore, the rates students of the experimental and the control group acquired from the measurement instruments have the equality of variances. In this direction, the independent samples t-test was performed in order to determine whether there is a significant difference between the scores of the participation inventory of the experimental and the control group. According to the results of the test, there is no significant difference between the pre-test scores of the experimental and the control group ($p>0.05$).

Table 2. Results of the variances equality and t-Test pre-test of the experiment and the control group

		Levene Test		**t-Test**				
Dimension	**Hypotheses**	***F***	***p***	***t***	***df***	***p***	**Mean Difference**	**S. E.**
Affective	Variances are homogeneous	2.39	0.12	-1.16	58	0.24	-0.20	0.17
Participation	Variances are not homogeneous				55.53			
Obedience-	Variances are homogeneous	5.20	0.06	-1.54	58	0.12	-0.31	0.21
Submission	Variances are not homogeneous				53.20			
Class	Variances are homogeneous	1.24	0.27	0.54	58	0.58	0.09	0.17
Participation	Variances are not homogeneous				56.46			
Cognitive	Variances are homogeneous	1.59	0.21	-0.40	58	0.69	-0.06	0.15
Participation	Variances are not homogeneous				53.03			
Non-	Variances are homogeneous	0.01	0.90	-0.24	58	0.80	-0.05	0.22
Participation	Variances are not homogeneous				57.99			

$p<0.05$

The participation inventory was applied for the students of the experimental group and the control group and the results obtained are represented in Table 3.

Table 3. The descriptive rates of the post-test the experimental and the control group acquired from the measurement instrument

Groups	Descriptive Rates	Affective Participation	Obedience-Submission	Class Participation	Cognitive Participation	Non-Participation
Experimental Group	Mean	4.26	4.30	4.36	4.21	2.35
	SS	0.50	0.62	0.53	0.56	0.78
	Median	4.20	4.33	4.30	4.21	2.33
	Variance	0.25	0.39	0.28	0.32	0.62
	Range	1.80	2.33	1.60	2.00	2.67
	Skewness	-0.08	-0.77	-0.28	-0.40	-0.38
	Kurtosis	-0.71	0.29	-1.09	-0.32	-0.98
Control Group	Mean	3.64	3.92	3.72	3.75	3.84
	SS	1.04	0.87	0.83	0.87	0.77
	Median	3.90	4.00	3.80	3.85	3.83
	Variance	1.09	0.76	0.69	0.76	0.60
	Range	3.80	3.33	3.60	3.14	2.67
	Skewness	-0.96	-1.03	-0.85	-0.63	-0.17
	Kurtosis	-0.71	0.29	-1.09	-0.32	-0.98
Total Number of Students		30	30	30	30	30

When Table 3 was analyzed, the highest mean score of the post-test was acquired from the class participation aspect and the lowest one from the non-participation aspect in the experimental group. The highest mean score was acquired from the obedience aspect and the lowest one from the affective participation aspect in the control group. On the other hand, since the skewness and kurtosis rates of the data set are within the range of ±1.5 it was determined that the variances have a normal distribution. The results of the independent samples t-test of the experimental and the control group are represented down below.

Table 4. The t-Test results of the post-test of the experimental and the control group

Dimension	Groups	n	Mean	SS	SD	t	p
Affective Participation	Experimental	30	4.26	0.50	58	2.95	0.04*
	Control	30	3.64	1.04			
Obedience-Submission	Experimental	30	4.30	0.62	58	1.92	0.06
	Control	30	3.92	0.87			
Class Participation	Experimental	30	4.36	0.53	58	3.49	0.00*
	Control	30	3.72	0.83			
Cognitive Participation	Experimental	30	4.21	0.56	58	2.43	0.01*
	Control	30	3.75	0.87			
Non-Participation	Experimental	30	2.35	0.78	58	-7.37	0.00*
	Control	30	3.84	0.77			

*p<0.05

When Table 4 is analyzed, it was determined that there is a significant difference between the two groups in terms of affective, class participation, cognitive, and non-participation aspects of the participation inventory (p<0.05). Although, a significant difference was not determined in the obedience/submission aspect (p>0.05). It was

determined that there is a difference in favor of the experimental group in affective, class participation, and cognitive participation aspects when the mean rates are regarded. On the other hand, it was determined that there is a mean rate in favor of the control group in the non-participation aspect.

Table 5. The comparison of the pre-test and post-test scores of the experimental and the control group

Dimension	Groups	Tests	n	Mean	SS	SD	t	p
Affective Participation	Experimental	Pre-Test	30	3.50	0.60	58	5.27	0.00*
		Post-test	30	4.26	0.50			
	Control	Pre-Test	30	3.71	0.75		-0.31	0.75
		Post-test	30	3.64	1.04			
Obedience-Submission	Experimental	Pre-Test	30	3.42	0.88	58	4.42	0.00*
		Post-test	30	4.30	0.62			
	Control	Pre-Test	30	3.73	0.65		0.94	0.34
		Post-test	30	3.92	0.84			
Class Participation	Experimental	Pre-Test	30	3.50	0.71	58	5.21	0.00*
		Post-test	30	4.36	0.53			
	Control	Pre-Test	30	3.41	0.60		1.66	0.10
		Post-test	30	3.72	0.83			
Cognitive Participation	Experimental	Pre-Test	30	3.49	0.68	58	4.45	0.00*
		Post-test	30	4.21	0.56			
	Control	Pre-Test	30	3.55	0.49		1.09	0.28
		Post-test	30	3.75	0.87			
Non-Participation	Experimental	Pre-Test	30	3.71	0.87	58	-6.29	0.00*
		Post-test	30	2.35	0.78			
	Control	Pre-Test	30	3.76	0.87		0.36	0.71
		Post-test	30	3.84	0.77			

*p<0.05

When the Table 5 is analyzed, it was determined that the use of EIN contents in teaching the musculoskeletal system has positive effects on the affective participation, obedience/submission, class participation, cognitive participation, and non-participation aspects of the students of the experimental group ($p<0.05$). On the other hand, it was determined that there was no significant difference in the control group where the traditional education method was used in terms of the affective participation, obedience/submission, class participation, cognitive participation, and non-participation aspects of the students ($p>0.05$).

The Opinions of the Students Regarding the EIN Content

The students in the experimental group of the study were posed questions regarding the positive and negative sides of the EIN contents. The feedback acquired from the students were combined in specific themes. According to this, 86.6% of the students stated that the lectures were enjoyable. For instance, it was determined that the students that are normally

bored in science lectures enjoyed the lectures by means of EIN application, the course videos attracted their attention, and they were content with the interactive activities. On another theme, 83.3% of the students stated that they learned the notions in the lecture better, the figures, images, and videos caused them to learn permanently. On the other hand, 13.3% of the students gave negative feedback stating that the lectures ended more quickly and the role of the teacher diminished in a learning environment where the EIN contents were dominant.

Discussion and Recommendation

In the study the EIN contents were used in teaching the subject of musculoskeletal system, the impact of it on the students' participation was attempted to get determined and at the same time the opinions of the students about the EIN contents were included. The facts that there are a limited number of studies conducted in the concerned literature, especially in teaching science, and EIN went into action in the near future are among the most powerful reasons why this study was conducted. In this respect, it is hoped that the study, with this aspect becomes a resource for both the literature and the educators. It is anticipated that analyzing the efficiency of such an education platform which pays regard to the needs and interests of students especially in the information age in which we live provides important contributions to the related literature.

When the descriptive rates acquired from the study are analyzed, it is determined that the mean scores acquired from the aspects of the participation inventory of the experimental group and the control group are close. Before the experimental study, the highest mean score was acquired from the non-participation aspect in both the experimental group and the control group. In the experimental group, the lowest mean score was acquired from the obedience/submission aspect yet it was acquired from the class participation aspect in the control group. At the end of the experimental study conducted, highest mean score was acquired from the class participation aspect in the experimental group and from the obedience/submission aspect in the control group in which the traditional education methods are used. On the other hand, the lowest mean score of the experimental group was acquired from the non-participation aspect and in the control group it was acquired from the affective participation aspect. In this context, when the post-test scores of the experimental group and the control group were compared, the rates of the use of the EIN contents in teaching musculoskeletal created differences significantly in favor of the experimental group

in terms of affective participation, class participation, cognitive participation, and non-participation aspects. According to these indications, it was determined that the lectures in which the EIN content is included have positive impacts on the levels of the affective, cognitive, and class participation and on the other hand the EIN content decreased the levels of the non-participation. The results obtained verify and support the similar results of the studies conducted in the literature (Kana & Aydın, 2017; Ünal & Hastürk, 2018). According to Kana & Aydın (2017) who emphasize this situation, the success of the students that use EIN learning platform increase as well. Therefore science teachers should encourage students to use EIN effectively and introduce the activities that promote the efficient interfaces of EIN. Additionally, they should use the rich content presented by EIN as much as possible in the learning environment. Because science is known as a course in which the abstract concepts are dominant by nature and it is a difficult course to learn (Aktaş, 2015). In this regard by means of the rich EIN contents, the difficulties students experience may be diminished and students may be given an opportunity to understand the abstract concepts. Thus, through the use of the interactive and non-interactive e-contents of EIN enriched with multimedia components in accordance with the education program, individual education of the students is also supported (MoNE, Educational Informatics Network, 2019).

Another finding of the research is the determination that the use of EIN course content in teaching the subject of musculoskeletal system, has a positive effect on affective participation, obedience/submission, class participation, cognitive participation and non-participation in pre-test and post-test scores and that there is a significant difference ($p<0.05$). In this regard, it can be said that the experimental study conducted with EIN content produced beneficial results. It can be stated that as a result of the course conducted with EIN content, students conveyed positive affective and cognitive properties towards the course, their obedience and submission levels and class participation levels were increased. On the other hand, by means of EIN content, the level of students' non-participation in science course was decreased and they conveyed more willingness to participate in class. These findings also coincide with the study results in literature (Aydoğan, 2016; Kenderli, 2017; Tolan-Sürbahanlı, 2018). EIN content increase class participation level of the students and positively affect their affective properties towards the course. Thus, according to Tolan-Sürbahanlı (2018), EIN course content positively affect the attitude of the students towards science course. Similarly, Aydoğan (2016) stated that EIN supported education creates a

significant difference in attitudes of the students. On the other hand, Kendirli (2017) stated that EIN course content is an important tool in increasing the success of students and it increased the interest of students towards the science course. In this regard, especially science teachers can use EIN course content as a tool to increase students' interest towards science course, encourage class participation and increase class participation levels. Moreover, positive aspect of EIN can be used in order to help students develop positive attitude towards science course.

Another finding of the research is gathered from opinions of students regarding EIN course contents. According to this, 86.6% of the students stated that classes are enjoyable, 83.3% stated that they learned the concepts better and 13.3% gave negative feedback related to the diminishing role of the teachers. In the light of these findings, it can be stated that EIN content arouses students' interest, they enjoy classes and they learn concepts better. On the other hand, they stated a need for adjusting the speed of course videos and increase in the active role of the teachers. These findings support the discourse of EIN course contents increases the interest of students towards the science course mentioned by Kendirli (2017). However Kana and Aydın (2017) stated that the students use them for doing tests and lecture videos and in this case students' level of interest towards the course was decreased. Similarly, Kendirli (2017) stated that EIN course contents are especially inadequate in drawing the attention of especially male students and emphasized that this situation needs to be considered in the learning environment. In this regard, in taking efficient advantage of the EIN learning platform it is rather valuable to use it towards conscious aims. According to the students' opinions, EIN affects the students' concept learning positively. On the other hand, with the help of EIN students find the opportunity to repeat the subjects that they did not understand, do more tests and receive help in preparation to exams (Kana & Aydın, 2017). In this regard, it is important for EIN to continue updating according to the needs of the students without losing momentum. Since it is known that middle school students have expectations from EIN learning platform such as improvement and the enrichment of the content, having a more attractive website, including interactive games (quiz contests) in the content of the website, immediate fix of the technical problems (Timur et al., 2017). Aside from all these narrations, there are some limitations of the study conducted. One of the most important limitations of the study is the inclusion of volunteer students. It is important to study the roles and the reactions towards EIN supported education application of the

students who did not want to volunteer in the study or students who were unable to participate because of technological inadequacies. Another limitation is related to the study's connection with the class hour time. In this regard, similar studies can be planned/conducted to include a more extensive chapter or subject. At the same time, the efficiency of the EIN course content on different education levels can be researched and compared with the results of other studies.

Suggestions

A more intensive use of EIN learning platform by course teachers which renders students more active by providing convenience in learning activities should be encouraged. Awareness of EIN learning platform should be increased be it towards teachers, be it towards students and their families through improving the substructure and hardware system in schools. Activities regarding the efficient use of EIN and its contents should be organized through in-service training activities especially for teachers. Improvement activities on EIN should be conducted according to the expectations of teachers and students. Interaction of course contents and EIN learning platform should be advanced to the next level. Course teachers should be given more duties in developing the source materials for EIN learning platform and an encouragement system should be developed.

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Authorship Contribution Statement

Gökçe OK: *Conceptualization, Methodology, Software, Formal Analysis, Data Curation, Writng-original draft.*

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