



High school students' class-related achievement emotions in geography lessons

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Abstract

This study aims to examine high school students' class-related achievement emotions and to examine teachers' role in students' class-related achievement emotions in geography lessons. The participants of the study were 376 high school students (94 male and 282 female) and three Geography teachers (2 male and 1 female) from four different high schools. This study uses a survey design. Data from the students were collected by the Achievement Emotions Questionnaire developed by Pekrun et al. (2011) and translated to Turkish by Can, Emmioğlu-Sarıkaya, and Bardakçı (2020). Data from the teachers were collected using a questionnaire consisting of three open-ended questions. Results showed that students' enjoyment, anger, and hopelessness emotions have changed statistically significantly from the beginning to the end of the geography lessons. Having a different teacher had a statistically significant effect on students' class-related achievement emotions of enjoyment, hope, hopelessness, anger, and pride. Findings showed that the three teachers participating in this study used lectures, discussion, and question-and-answer techniques, and they use presentations on the smartboard for the instruction. Teachers stated that they felt enjoyment, hope, hopelessness, anger, and anxiety when teaching geography lessons and that their emotions depend on the students' achievement and interest in learning geography. This study suggests high school geography teachers be aware of their emotions and students' achievement-related emotions. We suggest further research to examine the student-teacher relationships in terms of the class-related achievement emotions in geography lessons.

Keywords: Geography education, achievement emotions, class-related achievement emotions, secondary education

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1. Introduction

Emotions, which are a product of the reaction of individuals to the social environment they are in, and the traces left by the experiences in the human mind (Alparslan & Ulubey, 2019) are important in every moment of human life. Starting a day in the morning (Ergün, 2009), starting a new job (Sümer, 2020), going to a night of sleep (Omrak, 2019), and learning (Brigido et al., 2010; Pekrun & Linnenbrink-Garcia, 2012) may affect our emotions. No emotion is considered unnecessary, unimportant, worthless, or something that needs to be eliminated. Every emotion has a unique role in human life (Çenesiz, 2018).

Emotions play an important role in education. What we learn in the lesson and what we do during the lesson may affect our emotions. And emotions we have may affect our experiences and our learning. Recent research shows that emotions deeply affect students' performance and academic participation (Pekrun & Linnenbrink-Garcia, 2012). Positive emotions cause the development of new and creative ideas and actions in learning, as well as the discovery of social ties and the production of new knowledge (Tan, 2021). Negative emotions, on the other hand, may lead to the inability to produce high-level thinking and may lead the brain to mere memorization by not taking risks, not realizing possibilities, and repeating automatic behaviors (Keleş & Çepni, 2006).

The importance of emotions in education has led to the evaluation of achievement emotions as an important emotion type in academic life. Achievement emotions are defined as emotional states that arise in connection with academic activities or with academic outcomes (Pekrun et al. 2011).

Control value theory proposed by Pekrun (2006) posits that achievement emotions arise when individuals feel in control of, or out of control of, activities and outcomes that are valuable. For example, for a student to enjoy attending a class, it should be both controllable and valuable for the student. It is stated in the control value theory that there are different types of achievement emotions and that achievement emotions occur in different academic settings such as attending a class, studying, or taking an exam. Therefore, different academic environments should be evaluated independently of each other in the sense of achievement. Students who have negative emotions while listening to the lecture may have positive emotions about the exam. Again, a student who feels negative about the lesson before the lesson may feel positive emotions after the lesson.

Pekrun (2006, Pekrun et al., 2011) uses a three-dimensional taxonomy for explaining achievement emotions. In this framework, achievement emotions can be grouped in terms of valence (positive and negative), activity (activating and deactivating), and outcome. Based on the control value theory, Pekrun et al. (2011) developed a questionnaire, the Achievement Emotions Questionnaire (AEQ), to measure achievement emotions. AEQ addresses activity emotions (enjoyment, boredom, anger), prospective

outcome emotions (hope, anxiety, hopelessness), and retrospective outcome emotions (pride, relief, shame) and in terms of valence and activity, they categorize the achievement emotions as positive activating (enjoyment, hope, pride) positive deactivating (relief), negative activating (anger, anxiety, shame) and negative deactivating (hopelessness and boredom).

Many studies show that students' sense of achievement has an impact on academic success (Camacho-Morles et al., 2021; Daniels, 2009; Mega et al., 2014; Forsblom et al., 2022; Lam et al., 2015; Niculescu et al., 2015; Suzuki & Tonegawa, 2020;). And achievement emotions have motivational (Artino et al., 2012; Fierro-Suero et al., 2020), self-regulatory (Ahmed et al., 2013; Alparslan & Ulubey, 2019), and cognitive aspects (Daniels et al., 2008; Frijda, 1987).

The teacher-student relationship has a great impact on student achievement (Becker et al., 2017; Lee, 2007; Sutton & Wheatley, 2003) and emotions (Frenzel et al., 2009; Liman, 2021). Teachers play a leading role in the classroom and their behaviors might be reflected in students' success, attitudes, and emotions (Sünbül, 1996). Doğanay (2002) states that "educating and teaching with endearment is the most difficult art to achieve". Doğanay said that "those who learn and teach geography leads a happy life. Because they are lucky people who sense the beauties of nature". Indeed, the real purpose of geography lessons, which opens a door for understanding the world, getting answers to questions about the world, questioning, and discovering the beauties of the universe, may touch the emotional side of the students. As in all courses, emotions are also important in terms of teaching geography.

The effects of the various effects of emotions in teaching have been revealed in several course-specific studies; for example, in mathematics (Alparslan & Ulubey, 2019; Karadağ, 2020; Villavicencio & Bernardo, 2016), science (Üçüncü & Chios, 2019, Sönmez, 2020), english (Can & Güven, 2020, Can, 2018; Elmalı Özsaray & Eren, 2018; Kök, 2017), and biology (Avar, 2017). Some studies have stated that negative attitudes and anxiety about the geography lesson negatively affect the learning process of students (Bekdemir & Başbüyük, 2011; Çepni, 2015; Demirkaya & Arıbaş, 2004; Kaya & Koca, 2016; Özdel, 2019). However, to our knowledge, no study has investigated students' achievement emotions in geography lessons. This study aims to examine the changes in high school students' achievement emotions from the beginning to the end of the geography lessons and to examine whether teachers have a role in students' achievement emotions. Below are the research questions of the study: (1) Do high school students' achievement emotions change from the beginning to the end of the geography lessons? (2) Do teachers have a role in high school students' achievement emotions?

Method

1.1. Participants

The participants of the study were 376 high school students (94 male and 282 female) and three Geography teachers (2 male and 1 female) from four high schools in the Central Black Sea Region of Turkey. The participants of the study were informed about the research, and they volunteered to participate in the study. This study was approved by the Tokat Gaziosmanpaşa University Social and Human Sciences Research Ethics Committee (date: April 27, 2021, approval number: 01-62).

1.2. Measures

Achievement Emotion Questionnaire (AEQ) developed by Pekrun et al. (2011) and adapted to the Turkish language by Can, Emmioğlu-Sarıkaya, and Bardakçı (2020) has been used for collecting data from students. AEQ has different scales that measure class-related emotions, learning-related emotions, and test-related emotions. And these scales are used in three settings: before, during, and after. In this study, we used class-related emotions scales of the AEQ before and after the situation of attending the geography class. Class-related emotions before the situation of attending a class scale of the AEQ measures the following emotions: enjoyment, hopelessness, anger, hope, and anxiety. And after the situation of attending a class scale of the AEQ measures enjoyment, hopelessness, anger, shame, and pride. The AEQ class-related achievement emotions scale has both pre and post versions for assessing the emotions of enjoyment, anger, and hopelessness.

To collect data from teachers, a questionnaire including three open-ended questions was administered to teachers. These questions were: (1) how long have you been teaching geography? (2) please describe how you teach the geography course, the instructional methods, and the instructional materials you use in a typical class hour. (3) In general, how do you feel in class when you teach geography?

1.3. Data Collection

This study uses a survey design. Data were collected by the first author from students and teachers in regular classroom settings. Data collection took about 40 minutes. Both within and between-subject designs were applied as the change in students' achievement emotions before and after the classes and teachers' role in students' class-related achievement emotions have been explored.

1.4. Data Analysis

Means and standard deviations as descriptive statistics were used to examine students' class-related achievement emotions and student characteristics. A repeated sample t-test was used to examine the difference in students' anger, enjoyment, and hopelessness feelings before and after attending the geography lesson. One-way

MANOVA was used to examine the effect of teachers on students' class-related achievement emotions: enjoyment, hopelessness, anger, hope, anxiety, shame, and pride. Bonferroni adjustment was used to minimize the Type I error by dividing the alpha level (.05) by the number of comparisons made. Therefore, p values were compared to .005 for the F test of the MANOVA, and p values were compared to 0.017 when running the repeated sample t-test.

Assumptions of the repeated samples t-test and one-way MANOVA have been examined. Independent observations, normal distribution of data, no influential outliers, homogeneity of the population covariance matrix for dependent variables, and interval/ratio scale on dependent variables assumptions have been examined. Univariate normal distribution was checked using Skewness and Kurtosis values and histograms. Both Skewness and Kurtosis values were close to zero and histograms showed normal curve of distributions. We concluded that the normal distribution assumption has been met. Boxplots, Cook's distance, and Leverage values showed there were no outliers in the data set. And as the first author collected the data in a regular classroom setting and she was observant during the data collection, the independent observation assumption has also been met. Box's test of equality of covariance matrices resulted in a statistically significant result indicating that homogeneity of the population covariance matrix for dependent variables assumption has not been met. Pillai's trace criterion for MANOVA was used as it is more robust to departures from assumptions. Homogeneity of variance has been examined using Levene's test. It yielded statistically significant results for pre-anxiety and pre-anger dependent variables. As the homogeneity of variance assumption has not been met for these dependent variables, Dunnett C was used as a post hoc test.

The qualitative data that were collected from the teachers have been analyzed using descriptive qualitative analysis. Each questionnaire including teacher responses has been read and descriptively summarized independently by two researchers. The summaries have been compared and combined and after reaching 100% agreement and the descriptions of the three teachers' answers have been presented in the study.

2. Results

2.1. Change in Achievement Emotions from the Beginning to the End of the Lessons

At the beginning of the geography lessons, students' levels of anxiety ($M= 2.34$, $SD=.90$), anger ($M=2.05$, $SD=1.39$), and hopelessness emotions ($M=2.09$, $SD=1.01$) were low; and students felt neutral in terms of hope ($M=3.36$, $SD=.93$) and enjoyment ($M=3.15$, $SD=1.11$). At the end of the geography lessons, students' levels of anger ($M=2.44$, $SD=1.20$), hopelessness ($M=2.38$, $SD=1.27$), shame ($M=2.33$, $SD=1.16$) were low and students felt neutral in terms of enjoyment ($M=3.28$, $SD=1.04$) and pride ($M=3.32$, $SD=1.03$) (Table 1).

Table 1. Mean, and standard deviation values for students' achievement emotions

	<i>n</i>	<i>M</i>	<i>SD</i>
Post anger	375	2.44	1.20
Pre hope	376	3.36	.93
Pre enjoyment	376	3.15	1.11
Post enjoyment	375	3.28	1.04
Pre hopelessness	376	2.09	1.01
Post hopelessness	375	2.38	1.27
Pre anxiety	376	2.34	.90
Pre anger	372	2.05	1.39
Post shame	375	2.33	1.16
Post pride	375	3.32	1.03

Students' enjoyment, anger, and hopelessness emotions changed statistically significantly from the beginning to the end of the geography class. Students' enjoyment increased after the class, $t(374) = 2.75, p < .017$, Cohens' $d = .15$, small effect. Students' anger increased after the class, $t(370) = 5.39, p < .017$, Cohen's $d = .28$ medium effect, and likewise their hopelessness emotions increased from the beginning to the end of the geography class, $t(374) = 4.90, p < .017$, Cohen's $d = .25$ medium effect.

Table 2. Repeated sample t-tests

	<i>M</i>	<i>SD</i>	<i>SEM</i>	<i>95% CI</i>		<i>t</i>	<i>df</i>
				Lower	Upper		
Pre enjoyment – Post enjoyment	-.14	.96	.05	-.23	-.04	-2.75*	374
Pre anger – Post anger	-.38	1.35	.07	-.51	-.24	-5.39*	370
Pre hopelessness- Post_hopelessness	-.29	1.14	.06	-.41	-.17	-4.90*	374

* $p < .017$

2.2. Results Obtained from the Teacher Questionnaire

Teacher A is female. She works as a geography teacher for one year. She states that when the students' academic level is higher, she enjoys the lessons, and she is happier

and hopeful; however when students' success level is low, she feels anxiety, hopelessness, and anger.

Teacher B is male. He works as a geography teacher for 12 years. He states that when he teaches students who do not have high achievement expectations and are not at the required readiness level, it is tiring and demotivating for him to teach, and then he feels hopeless and anxious.

Teacher C is male. He currently works at two different high schools from which the data were collected. He works as a geography teacher for 14 years. He states that he likes geography, and he likes teaching geography. In general, he feels enjoyment and hope, but sometimes he feels hopeless when teaching his lessons.

The instructional methods and instructional materials used by the three teachers were in common. They all stated that they mainly used lectures as the teaching method. They use question and answer and discussion techniques. As teaching materials, all of them use PowerPoint presentations using the smartboard.

2.3. Teachers' Role in Students' Course Related Achievement Emotions

MANOVA results showed that students' class-related achievement emotions were depended on their teachers, $F(20,720) = 6.195$, *Pillai's Trace* = .294, $p < .05$, *partial η^2* = .147. Having a different teacher had a statistically significant effect on students' enjoyment, $F(2, 368) = 39.698$, $p < .005$, hopelessness $F(2, 368) = 5.533$, $p < .005$, anger $F(2, 368) = 17.142$, $p < .005$, and hope $F(2, 368) = 13.026$, $p < .005$ emotions at the beginning of their geography lessons. And having a different teacher had a statistically significant effect on students' enjoyment, $F(2, 368) = 20.264$, $p < .005$, anger, $F(2, 368) = 13.671$, $p < .005$, and pride, $F(2, 368) = 22.856$ emotions at the end of the geography lessons.

We used partial eta squared (η_p^2) values for assessing the effect size and used the benchmarks of .01 as small, .06 as a medium, and .14 as large effects for interpreting the effect size (Norouzian & Plonsky, 2018). Our results showed that teachers had a small effect on students' pre hopelessness ($\eta_p^2 = .03$); medium effect on students' post enjoyment ($\eta_p^2 = .10$), pre hope ($\eta_p^2 = .07$), pre anger ($\eta_p^2 = .09$), post anger ($\eta_p^2 = .07$), post pride (.11); and large effect on students' pre enjoyment ($\eta_p^2 = .18$). Mean and standard deviations and F tests for each dependent variable are presented in Appendix A.

Dunnett C test was used for post hoc analysis. Results showed that students taught by Teacher B and Teacher C had higher scores on the positive emotions (enjoyment, hope, and pride) and lower scores on negative emotions (hopelessness, anxiety, and anger) compared to the students taught by Teacher A. There was no statistically significant difference between the students taught by Teacher B and Teacher C (Appendix B).

3. Discussion

This study examined the class-related achievement emotions of the high school students and teachers' role in explaining these emotions. Results of our study showed that students' emotions changed at the end of attending a geography class. This result shows that attending a geography class made students more emotionally charged in terms of class-related emotions of enjoyment, anger, and hopelessness. Students' scores in both positive and negative emotions, enjoyment as positive activating emotion, anger as negative activating emotion, and hopelessness as negative deactivating emotion increased during the class.

This study also showed that students' achievement emotions were dependent on their teachers. Following emotions of the students' are affected by having a different teacher: enjoyment at the beginning and at the end of attending geography class, hope at the beginning of the class, hopelessness at the end of the class, anger at the beginning and the end of the class. Comparing the sizes of these effects, teachers had a large effect on students' enjoyment at the beginning of the geography lesson. In other words, teachers have an important role in the level of students' enjoyment at the beginning of the geography lesson. Because of their teachers, students may start the lesson already with a positive feeling.

In our study, all three teachers were using similar instructional methods and materials, but there was variability in gender and seniority. Teachers stated that their emotions depend on the students. For example, if students are interested in learning geography and if the students are successful in geography, teachers stated that they feel enjoyment and hope while teaching geography. This study proposes that there might be reciprocal relationships between students' and teachers' emotions. However, our study provides limited evidence to prove this claim as it is limited to the data collected from only three teachers. Broader research collecting data from a higher number of teachers is suggested for exploring the dynamics of student-teacher relationships in terms of class-related emotions. Further research should also investigate the impact of achievement emotions on students' success in geography courses.

The abundance of research shows that achievement emotions are important (i.e., Jarrell & Lajoie, 2017; Putwain et al., 2021) and emotions are related to students' learning (Camacho-Morles et al., 2021). Literature also suggests that teachers impact students' attitudes and emotions (Lazarides & Buchholz, 2019). We suggest geography teachers be aware of their role in students' emotions in class. Teachers may also observe students' emotions and implement activities that would support positive activating emotions such as enjoyment, hope, and pride, and try to reduce negative emotions such as anger, hopelessness, and shame.

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Appendix A. Means, standard deviations, F test, partial eta squared results

	Teacher	<i>M</i>	<i>SD</i>	<i>n</i>	<i>F</i> (2, 368)	η_p^2
Pre enjoyment	Teacher A	2.5205	.98918	130	39.698*	.18
	Teacher B	3.4255	1.04201	94		
	Teacher C	3.5397	1.00708	147		
	Total	3.1536	1.11044	371		
Post enjoyment	Teacher A	2.8462	.94135	130	20.264*	.10
	Teacher B	3.6082	1.06220	94		
	Teacher C	3.4705	.99019	147		
	Total	3.2866	1.04274	371		
Pre hopelessness	Teacher A	2.2938	.96477	130	5.533*	.03
	Teacher B	2.0495	1.05005	94		
	Teacher C	1.9024	.95125	147		
	Total	2.0768	.99375	371		
Post hopelessness	Teacher A	2.6346	1.24014	130	4.855	.03
	Teacher B	2.1277	1.17761	94		
	Teacher C	2.3027	1.31321	147		
	Total	2.3747	1.26750	371		
Pre anxiety	Teacher A	2.4817	.93051	130	3.632	.02
	Teacher B	2.3409	.97558	94		
	Teacher C	2.1943	.78072	147		
	Total	2.3321	.89277	371		
Pre anger	Teacher A	2.5923	1.48739	130	17.142*	.09
	Teacher B	1.6383	1.10571	94		
	Teacher C	1.8367	1.31920	147		
	Total	2.0512	1.38917	371		
Post shame	Teacher A	2.3538	1.16879	130	0.088	.00
	Teacher B	2.3138	1.16394	94		

	Teacher C	2.2959	1.14640	147		
	Total	2.3208	1.15587	371		
Post pride	Teacher A	2.8583	.91926	130	22.856*	
	Teacher B	3.5035	1.01666	94		.11
	Teacher C	3.6066	.98131	147		
	Total	3.3183	1.02492	371		
Pre hope	Teacher A	3.0469	.95579	130	13.026*	
	Teacher B	3.4577	.79765	94		.07
	Teacher C	3.5897	.92556	147		
	Total	3.3661	.93502	371		
Post anger	Teacher A	2.8513	1.13291	130		
	Teacher B	2.1223	1.13043	94	13.671*	.07
	Teacher C	2.2506	1.19810	147		
	Total	2.4286	1.19762	371		

* $p < .005$

Appendix B. Dunnet C Follow Up Test Results

Dependent Variable	(I) Teacher	(J) Teacher	Mean Difference (I-J)	Standard Error
Pre enjoyment	Teacher A	Teacher B	-.9050*	.13812
		Teacher C	-1.0192*	.12011
	Teacher B	Teacher A	.9050*	.13812
		Teacher C	-.1142	.13583
	Teacher C	Teacher A	1.0192*	.12011
		Teacher B	.1142	.13583
Post enjoyment	Teacher A	Teacher B	-.7620*	.13718
		Teacher C	-.6244*	.11613
	Teacher B	Teacher A	.7620*	.13718
		Teacher C	.1376	.13665
	Teacher C	Teacher A	.6244*	.11613
		Teacher B	-.1376	.13665
Pre hopelessness	Teacher A	Teacher B	.2444	.13744
		Teacher C	.3915*	.11539
	Teacher B	Teacher A	-.2444	.13744
		Teacher C	.1471	.13374
	Teacher C	Teacher A	-.3915*	.11539
		Teacher B	-.1471	.13374
Post hopelessness	Teacher A	Teacher B	.5070*	.16304
		Teacher C	.3319	.15350
	Teacher B	Teacher A	-.5070*	.16304
		Teacher C	-.1751	.16274
	Teacher C	Teacher A	-.3319	.15350
		Teacher B	.1751	.16274
Pre anxiety	Teacher A	Teacher B	.1408	.12956
		Teacher C	.2874*	.10396

	Teacher B	Teacher A	-.1408	.12956
		Teacher C	.1466	.11946
	Teacher C	Teacher A	-.2874*	.10396
		Teacher B	-.1466	.11946
	Teacher A	Teacher B	.9540*	.17328
		Teacher C	.7556*	.16987
Pre anger	Teacher B	Teacher A	-.9540*	.17328
		Teacher C	-.1984	.15762
	Teacher C	Teacher A	-.7556*	.16987
		Teacher B	.1984	.15762
	Teacher A	Teacher B	.0400	.15786
		Teacher C	.0579	.13946
Post shame	Teacher B	Teacher A	-.0400	.15786
		Teacher C	.0179	.15282
	Teacher C	Teacher A	-.0579	.13946
		Teacher B	-.0179	.15282
	Teacher A	Teacher B	-.6452*	.13227
		Teacher C	-.7482*	.11424
Post pride	Teacher B	Teacher A	.6452*	.13227
		Teacher C	-.1030	.13246
	Teacher C	Teacher A	.7482*	.11424
		Teacher B	.1030	.13246
	Teacher A	Teacher B	-.4108*	.11746
		Teacher C	-.5428*	.11338
Pre hope	Teacher B	Teacher A	.4108*	.11746
		Teacher C	-.1320	.11223
	Teacher C	Teacher A	.5428*	.11338
		Teacher B	.1320	.11223
post_anger	Teacher A	Teacher B	.7289*	.15319
		Teacher C	.6007*	.14014

Teacher B	Teacher A	-.7289*	.15319
	Teacher C	-.1282	.15284
Teacher C	Teacher A	-.6007*	.14014
	Teacher B	.1282	.15284

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