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Examining Academic Flow Levels of High School Students According to Different Variables*

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Abstract

This study aims to investigate the relationship between academic flow levels of high school students and academic self-efficacy, self-regulation and school engagement. 893 high school students participated in this survey study, which aims to determine the relationships between the predetermined variables. Flow Scale in the Academic Context (FSAC), Academic Self-efficacy Scale (ASES), Self-regulation Scale (SRS) and Utrecht School Engagement Scale (USES) were administered to the participants. The data obtained were analyzed using correlation coefficient calculations, independent sample t test and one-way variance analysis (ANOVA). The study revealed that academic flow, which is the dependent variable of the study, significantly correlates with academic self-efficacy, self-regulation and school engagement. It was also found that academic flow does not differ significantly according to gender while it significantly correlates with grade point average (GPA). This study deals with the concepts related to academic flow experiences of high school students. It is thought that the data obtained within the scope of the study allowed the authors to develop a road map that might encourage students to experience more flow in academic contexts.

Keywords: Flow, School Engagement, Self-Efficacy, Self-Regulation.

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Geniřletilmiř zet

Problem: Mutluluęu elde etmek asırlardır insanlıęın nemli gndem maddeleri arasında yer almıřtır. Mutluluęu anlamak iin kuramların yol gstericilięine ihtiya duyulmakla birlikte ok sayıda mutluluk kuramı literatrde mevcuttur. Bu anlamda mutluluęu aıklamada dikkat ekici kuramlardan birisi de Mihalyi Csikszentmihalyi'ye ait akıř kuramıdır. İ sreleri kontrol ederek mutluluęa ulařma sreci olarak ifade edilen akıř yařamın farklı alanlarında deneyimlenebilmektedir. Sanat, spor etkinlikleri; ekstrem faaliyetler ve endstriyel ortamlarda akıř tecrbe edilebilirken bu alanların yanında eęitim ortamlarında da akıř yařanabilmektedir. ęrenciler perspektifinden bakıldıęında yılın byk bir oęunluęu akademik faaliyetlerle okullarda geirilmektedir. Buna gre okul faaliyetlerinden verim elde etme, bařarıya ulařma noktasında bařat kavramlardan birisi bu faaliyetler esnasında akıř deneyimleyebilmektedir. Bu anlamda bu arařtırmanın temel problemi lise ęrencilerinin akademik faaliyetlerde akıř deneyimlemeleriyle iliřkili kavramların ve bu kavramlar arasındaki iliřki dzeylerinin tespit edilmesidir. Bu problem doęrultusunda akademik baęlamda akıř ile akademik z yeterlik, z dzenleme ve okul baęlılıęı kavramları ele alınmıřtır.

Arařtırma Sorusu: "Lise ęrencilerinin akademik baęlamda akıř dzeyleri ile akademik z yeterlik, z dzenleme ve okul baęlılıęı arasında anlamlı iliřkiler var mıdır?" ifadesi arařtırmanın temel sorusunu oluřturmaktadır. Bununla birlikte katılımcıların akademik baęlamda akıř dzeylerinin cinsiyet ve akademik not ortalaması deęiřkenine gre istatistiksel olarak farklılařıp farklılařmadıęı da incelenmiřtir.

Yntem: Bu arařtırma betimsel yntemli bir iliřki tarama arařtırmasıdır. Etik kurul izni doęrultusunda 4 okul trnden (Fen Lisesi, Anadolu Lisesi, Mesleki ve Teknik Anadolu Lisesi, İmam Hatip Lisesi) Bursa'da yer alan 20 farklı lisede ęrenimlerini srdren 893 ęrenci katılımcı grubu oluřturmaktadır. lekler COVID-19 salgını sebebiyle online řekilde Google Form aracılıęıyla katılımcılara ulařtırılmıřtır. Arařtırmanın katılımcılarına yař, cinsiyet, okul ismi ve akademik not ortalaması gibi soruları ieren kiřisel bilgi formunun yanında akademik baęlamda akıř leęi, z dzenleme leęi, akademik z yeterlik leęi ve Utrecht okul baęlılıęı leęi yneltirmiřtir. Katılımcılardan elde edilen veriler SPSS 26.0 paket programında iřlenmiřtir. Bu kapsamda Pearson Momentler arpımı Korelasyonu ile tek ynl varyans analizi (ANOVA) ve baęımsız rneklem t testi analizleri kullanılmıřtır.

Bulgular: Yapılan analizler sonucunda katılımcıların arařtırmanın 4 deęiřkeninde de (akademik baęlamda akıř, akademik z yeterlik, z dzenleme ve okul baęlılıęı) ortalamasının zerinde puanlar elde ettikleri saptanmıřtır. Bunun yanında lise ęrencilerinin akademik baęlamda akıř dzeylerinin cinsiyete gre farklılařma durumu incelendięinde kız ęrencilerin akıř puanlarının erkeklere gre daha yksek olduęu ancak aradaki bu farkın istatistiksel aıdan anlamlı olmadıęı tespit edilmiřtir. Buna gre lise ęrencilerinin akademik baęlamda akıř dzeyleri cinsiyete gre anlamlı farklılık gstermemektedir. Arařtırma sonucunda elde edilen bir dięer bulgu not ortalamasına gre akıř dzeyinin incelenmesidir. Yapılan ANOVA sonucuna gre not ortalamasına gre anlamlı farklılık

tespit edilmiştir. 85-100 not ortalamasına sahip grubun 70-84,99 grubu dışındaki tüm gruplardan (0-49,99 / 50-59,99 / 60- 69,99) anlamlı derecede yüksek seviyede akışa sahip olduğu sonucuna ulaşılmıştır. Araştırma doğrultusunda elde edilen son bulgu ise 4 değişken arasındaki ilişki düzeyinin tespit edilmesidir. Yapılan analizler sonucunda akademik bağlamda akışla en yüksek düzeyde ilişkiye sahip değişkenin okul bağlılığı olduğu; okul bağlılığını akademik öz yeterlik ve öz düzenlemenin takip ettiği saptanmıştır. Değişkenler arasındaki ilişkiler orta ve güçlü düzeydedir.

Sonuç ve Öneriler: Araştırma kapsamında değişkenler arasında anlamlı derecede ilişkilerin olduğu; akademik bağlamda akışın cinsiyete göre farklılaşmazken akademik not ortalamasına göre farklılaştığı ve not ortalaması daha yüksek olanların akış düzeylerinin yüksek olduğu sonuçlarına ulaşılmıştır. Akış kuramına dair literatürde yer alan çalışmaların ağırlıklı olarak spor, sanat faaliyetleri ve iş ortamları üzerinde kümelendiği görülmektedir. Eğitim ortamları ve akademik faaliyetlerdeki akışı ele alan çalışmalar görece daha sınırlıdır. Bu anlamda bu araştırma eğitim ortamlarını ve akademik faaliyetleri ele alması bakımından özgün bir yan barındırmaktadır. Millî Eğitim Bakanlığı 2023 vizyonunda okulların öğrenci mutluluğunu artırıcı nitelikte olması gerektiği vurgulanmaktadır. Bu anlamda akış ile ilişkili olduğu tespit edilen 3 kavramın bu vizyonun yerine getirilmesi noktasında destekleyici olacağı; araştırmanın diğer bulgularının da okul ortamında akademik faaliyetlerde akış deneyimlenmesi noktasında yol gösterici olacağı düşünülmektedir. Son olarak araştırma doğrultusunda araştırmacılara ve uygulayıcılara yönelik öneriler aşağıda sunulmuştur:

- Araştırmanın bağımsız değişkenlerinin (akademik öz yeterlik, öz düzenleme ve okul bağlılığı) düzeylerinin arttırmaya yönelik deney desenli çalışmaların gerçekleştirilmesi ve akademik bağlamda akışa dair ölçümlerin tekrarlanması.
- Akademik faaliyetler esnasında akış deneyimleyen bir öğrencinin faaliyet süresince neler yaşadığını, akış deneyimini nasıl tanımladığını ortaya çıkartacak nitel çalışmaların gerçekleştirilmesi.
- Okulun tüm paydaşlarına (yönetici, öğretmen, veli, öğrenci) eğitim ortamlarında akış deneyiminin önemini, akış deneyimleme sonucunda hangi noktalara ulaşılabileceğini içeren bilgilendirici sunumlar hazırlama.
- Ev ortamında akış deneyimlemeyi kolaylaştıracak, akış deneyimleme noktasında yol gösterecek ilkelerin öğrenci ve velilere aktarılması.

Introduction

The ways to find happiness have always been a commonly discussed issue. Developed as of early 2000s, positive psychology approach introduces significant insights and explanations related to happiness (Seligman and Csikszentmihalyi, 2000). Despite the presence of various theories proposed to clarify happiness, the theory developed by Mihaly Csikszentmihalyi stands out in the

literature. Broadly speaking, flow refers to the process of achieving happiness by controlling one's inner life (Csikszentmihalyi, 2018). Flow experience, which is dependent on the presence of certain conditions such as clear goals, immediate feedback and skill-challenge balance, has been defined and revised based on the findings of the experimental studies conducted with mountaineers, chess players, painters and basketball players. Fulfillment of these three conditions of flow triggers certain reactions including distortion of temporal experience perception, complete absorption in an activity and loss of consciousness (Csikszentmihalyi, 1997). Thus, it is possible to conclude that flow is a determining factor for one's happiness and life quality. Flow theory, which is essential if one wishes to lead a quality life, has been examined mainly in relation to sports, art, business life and free time activities in the related literature. It is no doubt that these fields involve all conditions of flow; however, there is one more environment that fulfills flow conditions: Academic environments.

Students in Turkey spend 37 weeks of the year in schools by taking part in academic activities. They often deal with certain challenges during these academic activities such as developing and sustaining motivation, receiving feedback and coping with a problem requiring the use of certain skills. According to the 2021 Higher Education Institutions Exam (HEIE) data published by Student Selection and Placement Center (SSPC), (University Entrance Exam data were published, 2021), only a quarter of the students who scored higher than the threshold score in the university entrance exam were placed in the universities in Turkey (Higher Education Council, 2021). Under the light of these data, we can argue that effective participation in academic activities is essential for a high school student and flow experience during academic activities play a crucial role in ensuring this effectiveness. Indeed, the study performed by Diaz and Silveria (2012) revealed that students experience higher levels of flow during academic activities than free time activities. Similarly, Csikszentmihalyi and LeFevre (1989) reported higher levels of flow in business environments than at home. Accordingly, it can be concluded that it is possible to experience flow in academic environments as well; therefore, identifying the concepts contributing to this flow experience is essential.

Academic self-efficacy is one of these concepts associated with flow experiences in academic contexts. It refers to an individual's belief regarding successful fulfillment of an academic task (Zimmerman, 1995). The studies emphasized that individuals with self-efficacy stemming from previous performances, verbal persuasion, indirect experiences and psychological mood tend to cope with challenges by perceiving them as opportunities for personal development (Bandura, 1993). Since basic properties of self-efficacy such as clear goals and dealing with challenges are similar to those of flow conditions, academic self- efficacy was taken as the primary concept focused in this study.

Self-regulation, which is defined as managing emotions and behaviors and restructuring them whenever necessary in accordance with a predetermined goal (Zimmerman, 2000a), is another concept associated with flow. A self-regulated individual does not give up in the face of difficulties, sets clear goals and restructures his behaviors according to intrinsic and extrinsic feedback he

receives (Schunk and Zimmerman, 2007). Thus, self-regulation was determined as the second concept to deal with within the scope of this study due to the similarities between properties of self-regulation and flow experience.

The last concept whose relationship with academic flow is explored in the present study is school engagement, which is defined as a student's sense of belonging to school through his emotions, thoughts and behaviors. It is often characterized with some reactions and behaviors such as doing homework, finding school and school activities meaningful and enjoying these activities and restructuring one's behaviors in line with the feedback received (Fredricks, Blumenfeld and Paris, 2004). When certain properties of flow experience such as receiving feedback, attention and enjoying activities are considered, school engagement was determined as the last concept examined in the present study due to theoretical similarities between school engagement and flow experience.

Therefore, this study aims to investigate the relationship between academic flow levels of high school students and academic self-efficacy, self-regulation and school engagement. Şahan and Aypay argued that flow plays a significant role in students' happiness and pleasure they get in educational environments. In addition, 2023 vision of Ministry of National Education emphasized that schools should adopt an institutional identity enhancing happiness of their students ('Millî Eğitim Bakanlığı', t.y.). Therefore, this study aims to obtain invaluable and instructive findings in line with the vision statement of Ministry of National Education and the results of the studies focusing on academic flow.

Methodology

Research Design

This research is a correlational survey. In relational studies, the degree and existence of the relationship between more than one variable is examined (Karasar, 2011). Accordingly, in this research, the relationships between the academic flow and other variables were examined.

Sample and Procedure

The participants of the study are 9th, 10th, 11th and 12th grade high school students attending science-social science high schools, Anatolian high schools, vocational and technical Anatolian high schools and İMAM HATİP high schools located in Nilüfer, Osmangazi and Yıldırım districts of Bursa province in Turkey. The ages of the participants range between 14 and 19 (the average age=16), and 328 participants (36.7%) are male and 565 (63.3%) female. The details of descriptive statistics are displayed in *Table 1*.

*Table 1. Socio-Demographic Characteristics of the Respondents***Demographic Students**

No	Characteristics	Total	%
Gender			
1.	Male	328	36.7
	Female	565	63.3
Age			
	14-15	361	40.4
2.	16-17	420	47
	17-18	112	12.6
School Type			
	Anatolian HS	288	32.3
3.	Vocational HS	228	25.5
	Science-Social Science HS.	205	23
	Religious Vocational HS.	172	19.2
Grade			
4.	9	382	42.8
	10	190	21.3
	11	229	25.6
	12	92	10.3

HS: High School

The data was collected from 897 participants who attend 20 state-run high schools located in Bursa province in Turkey. The required research ethics committee permissions were taken from Bursa Provincial Directorate of National Education (**Document number: E – 86896125– 605.01 – 23426094**). The participants were accessed online via Google Form due to COVID-19 pandemic. The data obtained from 893 participants were analyzed since 4 participants were excluded from the analyses due to the incomplete replies to the scale.

Data Collection Tools

The data regarding socio-demographic variables including age, gender, the school attended, class year, GPA were obtained by asking the participants to fill out a personal information form.

FSAC: FSAC was administered to determine flow levels of high school students in academic activities. Developed by Şahan and Aypay (2021), the scale consists of 31 items under six dimensions (concentration and perception of time, unambiguous feedback, skill-challenge balance, autotelic experience action-awareness merging and, sense of control). The scale is scored between 1 and 6 (never – always). The reliability coefficient was calculated as 0.94 in the study.

ASES: The participants' self-efficacy levels in academic activities were determined through a scale developed by Jerusalem and Schwarzer and adapted to Turkish by Yılmaz, Güçray and Ekici (2007). The scale consists of 7 items and one single dimension. It is scored between 1 and 4 (never – always) and the seventh item is a reverse-scored item. The reliability coefficient was found to be .79 for the present study. **SRS:** Developed by Tuckman in 2002 in order to determine self-regulation levels of individuals, the scale was adapted to Turkish by Duru, Balkıs, Buluş and Duru (2009). It consists of 9 items under one single dimension and 3rd and 7th items are reverse-scored items. The scoring is based on 1 to 4 Likert scale (never – always). The reliability coefficient of the scale was calculated as .66 in the present study.

USES: Developed by Schaufeli et.al for business environments, Utrecht Work Engagement Scale was adapted to Turkish by Kutsal (2009) to collect data from students in school environments. The scale consists of 15 items under three dimensions; dedication, absorption and vigor. It uses 7-point Likert scale and its reliability coefficient was calculated as .95 in the present study.

Analyzing of Data The data obtained from the scale were analyzed by using SPSS 26.0 package software. In addition, descriptive statistics were used to determine the distribution of age, gender, class year and GPA variables. The relationships between academic flow and other variables (academic self-efficacy, self-regulation and school engagement) were examined by doing correlation analyses. Finally, independent t test and ANOVA were preferred to determine whether academic flow significantly differs according to gender and GPA.

Findings/Results

Parametric tests were preferred for the analyses since the scores obtained from FSAC, ASES, SS and USES displayed normal distribution (skewness and kurtosis values are between +- 1.96).

Accordingly, the correlations between academic flow, which is the dependent variable, and the independent variables were examined for the purposes of the study. In addition, independent sampling t-test was used to determine whether academic flow differs according to gender, and one-way variance analysis (ANOVA) was done to determine whether the dependent variable significantly differs according to GPA. Table 2 below displays statistics regarding the overall scores obtained from the scales and skewness-kurtosis values.

Table 2. Mean (SD) of academic flow, academic self efficacy, self regulation and school engagement values

	n	Mean (SD)	Min	Max	Skewness	Kurtosis
Academic flow (Total)	893	109.29 (27.64)	31	186	-0.12	-0.187
Academic self efficacy (Total)	893	18.81 (3.95)	7	28	-0.202	-0.135
Self regulation (Total)	893	25.83 (4.45)	9	36	-0.284	-0.264
School engagement (Total)	893	62.26 (20.99)	15	105	-0.18	-0.664

Table 2 shows that high school students received higher scores than the average dependent and independent variables. Table 3 and Table 4 d academic flow levels of the pa

Table 3. Examining the academic flow levels by gender

		Academic flow	N	Mean (SD)	df	t	p
Gender	Female		565	110.11 (27.08)	891	-1.162	.246
	Male		328	107.88 (28.57)			

According to Table 3, the academic flow levels of the female high school students are h than those of the male ones. The independent t-test was done difference is significant or not, and the test re differ according to gen

Table 4. Examining the academic flow levels according to grade point average (GPA)

	GPA	N	M	sd	F	p	Scheffe
Academic flow	1. 0 - 49,99	22	2.5	0.8			1<3*
	2. 50 - 59,99	58	3.1	1.0			1<4*
	3. 60 - 69,99	104	3.3	0.9	12.60	.000	1<5*
	4. 70 - 84,99	220	3.4	0.8	5		2<5*
	5. 85 - 100	489	3.6	0.8			3<5*

*p<.05

Table 4 presents the results of ANOVA, which was done to examine academic flow in relation to GPA. Since p value is .000 ($p < .05$), academic flow significantly differs according to GPA. In order to determine which two groups significantly differ, one of the Post-hoc tests called Scheffe was used after variance equality assumption was met ($p = .099$; $p > .05$). The results indicated that 0-49.99 group has significantly lower academic flow levels than all other groups except 50-59.99 group. Similarly, 50 – 59,99 and 60 – 69,99 groups have significantly lower levels of academic flow than 85-100 group.

The results of the correlation analysis showed that academic flow, which is the dependent variable of the study, correlates with all the independent variables. Specifically speaking, school engagement has the strongest correlation with academic flow ($r = .801$; $p < .01$), which is followed by academic self-efficacy ($r = .590$; $p < .01$) and self-regulation ($r = .505$; $p < .01$). The details about the correlation analysis are displayed in Table 5.

Table 5. Correlation Analyses

Variables	(1)	(2)	(3)	(4)
(1) Academic flow (Total)	1	.590**	.505**	.801**
(2) Academic self efficacy (Total)	.590**	1	.377**	.539**
(3) Self regulation (Total)	.505**	.377**	1	.544**
(4) School engagement (Total)	.801**	.539**	.544**	1

**p<.01

Discussion

This study investigated the relationship between academic flow levels of high school students and academic self-efficacy, self-regulation and school engagement and examined how flow differs according to gender and GPA. Firstly, the study found that academic flow does not differ according to gender variable, which was also reported in similar studies in the literature (Akman, 2018; Bassi and Delle Fave, 2004; Massimini and Carli, 1988). Indeed, Csikszentmihalyi, the founder of Flow Theory, noted that intrinsic motivation and skill- challenge balance rather than the content of activity and gender are the causal factors of flow experience (Csikszentmihalyi, 2015). Therefore, it is quite an expected result that flow does not differ according to gender.

As for the correlation between flow and GPA, the study found that 85-100 group experiences significantly higher levels of flow than all other groups except 70-84.99 group. There are studies in the literature reporting a positive correlation between flow and academic success (Adil, Ameer and Ghayas, 2020; Kuhnle, Hofer and Kilian, 2012; Sumaya and Darling, 2018). Sense of control, high levels of intrinsic motivation, setting goals and enjoying the activities are among the characteristics of successful students (Wong and Csikszentmihalyi, 1991). Similarly, Csikszentmihalyi, Latter and Duranso (2017) emphasize that flow experience is characterized with the following properties: sense of control, intensive concentration, high levels of intrinsic motivation and enjoying the activities. Accordingly, high academic flow levels of students with high GPA might be explained by the considerable similarities between characteristics of successful students and flow experience.

The correlation between academic flow and academic self-efficacy is .590. The studies performed by Sahranç (2008) and Stander, Rothmann and Botha (2015) reported findings indicating positive correlations between flow and self-efficacy. In addition, Bandura (1997) argues that an individual with self-efficacy canalizes all his energy to the current experience during challenging situations. Csikszentmihalyi (2018) also defines flow experience as “pushing the limits of human body in difficult situations”. In addition, Artino (2012) claims that self-efficacy is experienced when one has clear goals and receives relevant feedback. Clear goals and immediate feedback are among the conditions of flow experience as suggested by Csikszentmihalyi (1997). Thus, it might be noted that the similarities between these two concepts at theoretical level can explain the results of correlation analysis.

The correlation between academic flow and self-regulation is .505. There are studies reporting positive correlations between flow and self-regulation (Wan et.al., 2020; Miksza and Tan, 2015). Zimmerman (2000b) suggested that self-regulation refers to receiving feedback, paying attention to internal – external factors at optimum level and setting process-result goals. These characteristics are similar to those of flow experience. It is thought that the similarities between these concepts at theoretical level account for this correlation.

The highest correlation with academic flow was found for school engagement variable ($r = .801$) in the present study. The literature lists some studies reporting positive correlations between these two concepts (Johnson, 2004; Shernoff, Csikszentmihalyi, Schneider and Shernoff, 2003). School engagement is defined as “active participation in schools activities” (Furong et.al, 2003). In addition, the report published by National Research Council (2003) emphasizes that finding school activities valuable and meaningful is one of the significant indicators of school engagement. Similarly, Sahranç (2008) argued that experiences matching one’s life goals will lead to flow experience. Accordingly, students with high levels of school engagement and those who find school activities meaningful are often more active participants and display higher levels of flow experience.

Conclusion

Within the scope of the research, there are significant relations between the variables; flow in academic context did not differ according to gender, it did differ according to the academic GPA, and those with higher GPA had higher flow levels. It is seen that the studies in the literature on flow theory are mainly clustered on sports, art activities and business environments. Studies dealing with the flow in educational environments and academic activities are relatively limited. In this sense, this research has a unique aspect in terms of addressing educational environments and academic activities. In the 2023 vision of the Ministry of National Education, it is emphasized that schools should increase student happiness. In this sense, three variables that are found to be related to flow will be supportive in fulfilling this vision; it is thought that the other findings of the research will be guiding in terms of experiencing flow in academic activities in the school environment.

Recommendations

According to findings; some suggestions were made to practitioners and researchers. Whereas, carrying out experimental studies to increase the levels of the independent variables of the research (academic self-efficacy, self-regulation and school engagement) and repeating the measurements of flow in the academic context. Another suggestion for researchers is carrying out qualitative studies that will reveal what a student who experiences flow during academic activities experiences during the activity and how he defines the flow experience. Preparing informative presentations to all stakeholders of the school (administrator, teacher, parent, student) including the importance of flow experience in educational environments and

what points can be reached as a result of flow experience. Transferring the principles that will facilitate the experience of flow in the home environment and guide the point of experiencing flow to students and parents.

Limitations

The data obtained in the present study are limited to the replies provided for the four scales administered within the scope of the study. In addition, the research findings can be generalized

only to high school students since the data were collected from high schools students living in Bursa province.

Ethics Statements

The studies involving human participants were reviewed and approved by Bursa Provincial Directorate of National Education and Dokuz Eylul University (Document number: E – 86896125 – 605.01 – 23426094). The participants provided their written informed consent to participate in this study.

Conflict of Interest

It has been reported by the authors that there is no conflict of interest.

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