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Adaptation of the Social Media Addiction Scale into Azerbaijani Turkish: Validity and Reliability Study*

Aydan MALİKOVA*
Psychology, Baku State University, Baku, Azerbaijan
ORCID: 0009-0006-2936-4395

Cengiz ŞAHİN
Psychology, Ankara Hacı Bayram Veli University, Ankara, Türkiye
ORCID: 0000-0003-4875-4883

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Excessive attachment to social media, a constant desire to be online, being driven by uncontrollable motivation, and the negative impact of this situation on other significant areas of life are considered as social media addiction. In this study, the Social Media Addiction Scale Student Form (SMAS-SF), previously developed in Türkiye to determine students' levels of social media addiction, was adapted into Azerbaijani Turkish. The SMAS-SF is a five-point likert-type scale consisting of 29 items that can be grouped under four factors. The study group consisted of a total of 1,074 students aged 18-26 studying at different universities in Baku. The sample of the study was determined using the convenient sampling method, one of the non-probabilistic sampling determination types. Within the scope of the validity and reliability studies of the scale, expert opinion, exploratory factor analysis (EFA), confirmatory factor analysis (CFA), item total correlations, lower and upper group mean differences, and internal consistency coefficient and stability analyses were performed. As a result of the analyses, it was found that the original structure of the SMAS-SF, consisting of 29 items and 4 dimensions, was confirmed, and significant evidence was provided that it can be used as a valid and reliable measurement tool to determine the level of social media addiction among university students aged 18-26. The lowest possible score that can be obtained from the scale is 29, and the highest score is 145. A high score may indicate a high level of social media addiction in students.

Introduction

With the development of internet technology and subsequently web 2.0 technology in the 21st century, users have started to create content, share their created content with others, and comment on their posts. Thus, social networking sites or social media platforms have become widely preferred by users (Şahin, 2020). With the advent of web 2.0 technology, the use of internet applications such as multiplayer games, social networks, instant messaging,

* Correspondency: aydanmalikova1997@gmail.com

twitter, facebook, instagram has begun, making social media one of the fundamental ways of communication in human life.

Social media is a highly interactive mobile and web-based technology platform where content is shared and discussed (Kietzman et al., 2011). Social media is widely used by people of all age groups for various reasons starting from early childhood, based on numerous factors such as easy access to information, creating and sharing informational content, joining various groups and participating in events, observing applications that enhance professional knowledge, freely expressing any kind of opinion, joining professional career groups, job searching, sharing and acquiring various personal information on topics such as health and education, and meeting friends or acquaintances online (Barkhuus & Tashiro, 2010; Fox & Warber, 2013; Lazakidou, 2012; Şahin, 2020; Zhang et al., 2022).

According to the We Are Social Digital Report, the world's population reached 8.05 billion at the beginning of 2023. As of July 2023, a total of 5.56 billion people (69.1%) worldwide are using mobile phones. There are 5.19 billion people (64.5%) using the internet globally. Additionally, the data shows that the number of internet users worldwide has increased by 1.9% in the last 12 months. The report also indicates that 4.88 billion people (60.6%) are using social media worldwide (We Are Social, 2023a).

According to the same report, the population of Azerbaijan was approximately 10.39 million as of January 2023. The total population comprises 50.7% women and 49.3% men. In January 2023, the number of internet users reached 8.93 million (86.0%), while the number of social media users was 4.15 million (46.5%). This rate is 37.3% for women and 62.7% for men (We Are Social, 2023b). As observed, there has been an increase in social media usage both globally and in Azerbaijan year over year.

However, in the literature, it has been reported in many studies that uncontrolled and excessive use of social media can lead to various problems (Akram and Kumar, 2017; Dalamba, 2022; Griffiths et al., 2016). In addition, social media can lead to violations of privacy, identity problems, difficulties in fulfilling responsibilities, disruption of daily activities, information pollution, inactivity due to spending long periods of time on social media, and many related health problems (Binark et al., 2009).
While it is known that social media usage has increased globally and in Azerbaijan, and there are those who view this trend optimistically, there are also some negative consequences and risks associated with it. One of the most frequently discussed risks in recent times is social media addiction.

Previously referred to as internet addiction to describe excessive and uncontrolled internet use behavior, the term is also used as social media addiction due to the access to social media applications via the internet (Goldberg, 1999; Griffiths, 2000; Young, 1996).

Before defining social media addiction, it is important to explain the concept of addiction in order to understand the subject. Addiction is a situation that increases personal and social problems, causes loss of control, and continues to occur despite conscious attempts to avoid it (Marlatt et al., 1988). In the literature, addiction is divided into two categories: substance (such as drugs and excessive alcohol) and behavioral (such as gambling, technology addictions).

Substance addiction is the excessive use of drugs and other substances that give pleasure to the user and eliminate the state of tension, that continue to be used despite the knowledge of the expected negative consequences in the future, and that cause loss of control to disappear. Behavioral addiction is when a person's activities cause physical, psychological and social problems and the person continues to do them uncontrollably despite wanting to quit, so that

the person considers this behavior (such as technology, gaming, gambling, shopping, social media) unimportant in the process and continues to do it even if it harms himself and his environment (Şahin, 2020).

Today, social media addiction, which is considered a technological addiction, is also a behavioral addiction. Being excessively attached to social media, constantly wanting to be online, being driven by uncontrollable motivation, and the negative impact of this behavior on other important areas of life are considered signs of social addiction (Andreassen and Pallesen, 2014). The American Center for Online Addiction (2019) defines social media addiction as a behavioral addiction characterized by an excessive preoccupation with social media, an uncontrollable urge to use the applications, and spending so much time and effort on them that it disrupts other areas of life.

Researchers have not reached a consensus on the diagnostic criteria for social media addiction. There are different approaches by researchers on the subject. Although there are no standardized diagnostic criteria for social media addiction yet, the most basic symptoms include preoccupation with online activities, withdrawal, tolerance, loss of control, loss of interest in other activities, time loss, conflict, mood changes, failure, and relapse.

It is inevitable that individuals of all age groups spending excessive time on social media will face problems in fulfilling their personal, social, educational, and professional responsibilities. Additionally, various psychological, physical, and social issues may arise. Therefore, determining whether individuals are addicted to social media cannot be done through mere observation. Valid and reliable scales are needed for this purpose.

When the literature is reviewed, many scale development studies have been conducted in technologically developed countries regarding the use of social media, which affects almost every aspect of individuals' lives and has an important place in their daily lives. In the literature review, only the Internet Addiction Scale adapted by Kerimova and Günüç (2016) was found in Azerbaijan Turkish. However, no scale was found to determine individuals' social media addiction. Therefore, in this study, it was aimed to adapt the Social Media Addiction Scale - Student Form, which is widely used in Türkiye and different countries, short, multidimensional, psychometrically reliable and developed by Şahin (2018), into Azerbaijani Turkish and to examine its validity and reliability in a sample of university students. In this direction, it is believed that the research will contribute to students, researchers and mental health professionals.

Method

Research design

This research is a scale study developed within the context of descriptive survey research. Descriptive survey research involves collecting information through surveys or scales determined by the researcher, with a large sample size (Balcı & Korkmaz, 2020). Fraenkel and Wallen (2006) stated that in descriptive survey research, researchers are more concerned with how ideas and characteristics are distributed among the individuals in the sample rather than the reasons behind them. This study is an example of a scale that can be used in survey-type studies.

The study is a scale adaptation study conducted using quantitative research method. Scale adaptation is the process of transforming a scale designed for use by one cultural group into a structure that can be used by another cultural group. In the study, the Social Media Addiction

Scale: Student Form developed by Şahin (2018) was examined for its compatibility with Azerbaijani culture, and validity and reliability studies were conducted to make it suitable for university students in Azerbaijan.

Study Group

The study group consists of university students studying in Baku, Azerbaijan at the beginning of 2023. The study group was determined using a convenient sampling method within non-probabilistic sampling. When using a convenient sampling method, the suitability and willingness of participants to participate in the study are taken into account (Büyüköztürk et al., 2016; Creswell & Creswell, 2017).

For the comprehensibility of the scale adapted into Azerbaijani Turkish, a total of 30 university students participated in the initial application, with 14 males and 16 females. In scale adaptation studies, it was preferred to collect data from different sample groups for exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). In the literature, it is recommended to prefer different sample groups for exploratory and confirmatory factor analyses (Erkuş, 2016; Fabrigar et al., 1999). Therefore, a total of 1122 university students, 30 for the preliminary application, 614 for EFA and 478 for CFA, were reached. To determine the reliability of the scale, the test-retest method was used, and the application was conducted with the participation of 224 students (103 females and 121 males). The SMAS-SF was reapplied to the same group of students with a two-week interval. This procedure was conducted through a third study group consisting of university students. The distribution of the study group according to gender, class, and fields is summarized in Table 1.

Table 1. Demographic Characteristics of Participants

Variables	Group	Frequency	Percentage
Gender	Female	523	46.61
	Male	599	53.39
Class	1	306	27.28
	2	297	26.48
	3	267	23.78
	4 and above	252	22.47
Field	Science	462	41.18
	Humanities	386	34.40
	Social Sciences	274	24.42

All responses to the scales used in the final application were checked. It was decided not to include university students who responded rhythmically to the scale items, gave the same answer to all items, or were outside the 18-26 age group in the data set. After the relevant forms were removed, the data set was prepared for data entry.

Scale Adaptation Process

According to Seçer (2015), the sequential steps to be taken in the scale adaptation process are as follows: a) Determining the need and conducting a literature review. b) Obtaining permission from the developer of the scale for adaptation. c) Forming a team of language and field experts for translation studies and carrying out the translation. d) Determining the difference between the scales translated back into the target language and the source language and making corrections, if any. e) Calculation of exploratory and confirmatory factor analyzes and reliability coefficients for the construct validity of the scale after translation.

Literature Review

Several scale development studies have been conducted in technologically advanced countries regarding social media addiction, which affects almost every aspect of individuals' lives and holds a significant place in their daily lives.

A literature review reveals that various scales have been developed or adapted to assess social media addiction in different countries. However, in Azerbaijani Turkish, only the Internet Addiction Scale adapted by Kerimova and Günüç (2016) could be found. However, no scale has been found to determine social media addiction among individuals, especially university students.

Request for Permission for Adaptation Process

After determining the scale to be adapted, discussions were held with Şahin (2018), the developer of the scale, information regarding the scope and purpose of the research was provided, and permission for the use of the scale was obtained. Following the completion of the permission process, the adaptation process was initiated.

Translation Study

The scale has been translated into Azerbaijani Turkish, and then retranslated into the original language to prepare it for pilot testing. In the translation method, the original scale is first translated into the target language by field experts, and then it is translated back into the original language by another group of field experts (Looman & Farrag, 2009). In this study, the original scale was first translated into Azerbaijani Turkish by two different Turkish-speaking faculty members who are experts in the field of psychology and have studies on addiction. The scale translated into Turkish was re-translated back into Turkish by two individuals who are experts in the field and proficient in both languages, and then compared with the original scale. It was applied to 30 university students to determine whether the resulting scale could be well understood by the students. In the analyses, it was determined that all items in the scale were understandable by the participants.

Data Collection Process

Personal Information Form and Social Media Addiction Scale were used as data collection tools. Permission for the use of the scale was obtained via email from the researcher who developed the scale. In order to apply the scale used in the research, permission was obtained from Ankara Hacı Bayram Veli University Ethics Committee Commission and the data collection process started. The data of the study were collected within a period of 3 months in the spring semester of 2023-2024. First of all, permissions were obtained from the faculties of the universities where data were collected. After obtaining approval from the faculties, a meeting was held with class representatives to inform them about the study. It was evaluated that collecting data online would be appropriate. Data collection tools were prepared in “Google Form” format and the link was shared with all students through student representatives. The created form included the researcher's contact information, a brief description of the study, and a statement indicating that participation is voluntary. Participants were informed that completing the questionnaire would take approximately 5 minutes.

Data Collection Tools and Techniques

Two data collection tools were used to gather data for the study. These were the "Personal Information Form" developed by the researcher and the "Social Media Addiction Scale: Student Form" developed by Şahin (2018).

Personal Information Form: Consists of independent variables that are thought to affect demographic and social media addiction levels of university students.

*Social Media Addiction Scale: Student Form***:** It was developed by Şahin (2018) to determine students' social media addiction levels. Within the scope of validity studies, EFA and CFA analyses were conducted. As a result of the analyses, it was determined that the scale (SMAS-SF) consists of a five-point Likert type scale with 4 sub-dimensions and 29 items. Items 1-5 are described as virtual tolerance, items 6-14 as virtual communication, items 15-23 as virtual problem, and items 24-29 as virtual information. The KMO coefficient of the scale was found to be .96 and Barlet's significance value $\chi 2=12680.88$ (p=.00). Cronbach Alpha coefficient was found to be .93 for the whole scale. It was found to be .81 for virtual tolerance, .81 for virtual communication, .86 for virtual problem and .82 for virtual information. According to the results of the analyses, it was concluded that the SMAS-SF is a valid and reliable scale. The lowest score that can be obtained from the scale is 29 and the highest score is 145. A high score indicates that the student can be considered as a "social media addict".

Data Analysis

In the study, all analyses related to the data were conducted in appropriate sequence, taking into account the fundamental principles of scale adaptation. Firstly, normality, missing value, outlier, KMO, and Bartlett sphericity tests were applied. Then, the EFA process was conducted. Subsequently, the CFA test was applied. To determine the reliability coefficient, the Cronbach's alpha internal consistency test was conducted.

Results

First of all, the suitability of the data obtained from the study group for factor analysis was examined. The kurtosis and skewness values of the obtained data were calculated. Büyüköztürk et al. (2016) states that assumptions of normality for factor analyses are based on the kurtosis and skewness values of the data. The results of the kurtosis and skewness analysis applied to the data are presented in Table 2.

Table 2. Kurtosis and Skewness Values for Scale and Sub-dimensions

Variable	Sub-dimensions	Skewness	Kurtosis
Social Media Addiction Scale	Virtual Tolerance	.02	-.39
	Virtual Communication	.35	.58
	Virtual Problem	.29	.06
	Virtual Information	-.24	.23
	Total	.14	.32

When Table 2 is examined, it is seen that the kurtosis and skewness values for the dimensions in the data set are between -1 and +1. When the Skewness and Kurtosis values calculated over the sub-dimensions of the total score of the Social Media Addiction Scale were examined, the skewness value for the overall scale was calculated as .14 and the kurtosis value as .32; for the sub-dimensions, the skewness values were calculated as -.24, .35; kurtosis values as -.39, .58, respectively. Kurtosis and skewness values are expected to be

between -1 and +1 in order for the data to provide normality assumptions. (Tabachnick and Fidell, 2013). According to the data obtained, it is seen that the data are normally distributed. In addition, it was seen that there were no missing and extreme values in the data. After these procedures, KMO and Bartlett test results were examined to determine the suitability of the sample size of the scale for the selected analysis. The results of these tests are presented in Table 3.

Table 3. KMO Value and Bartlett Test Results

Social Media Addiction Scale KMO Value		.900
Barlett Test	Approx. Chi-Square	5401.195
	Df	406
	Sig.	.000

Before conducting EFA, the suitability of the data for factor analysis was determined by KMO and Bartlett's test. In order to conduct factor analysis on the data, it is recommended that the KMO value should be at least .70 and Bartlett's test should be significant (Kalaycı, 2009; Seçer, 2015). The high ratio indicates that the data are suitable for factor analysis (Kalaycı, 2009). In the study, the KMO test value was found to be .90 and Bartlett's test value was $\chi 2=5401.19$; sd=406 (p=.000). These results show that the data are suitable for factor analysis.

Findings Regarding Validity Analyses

Findings Regarding Exploratory Factor Analyses

In factor analysis, principal component analysis and varimax vertical rotation technique are used for items with factor loadings below .30 and items with loadings on two different factors (Balcı, 2009). As a result of the analysis conducted in this context, 6 factors with eigenvalues greater than 1.00 were identified. Considering the high number of factors, Cattel's Scree Plot test was conducted.

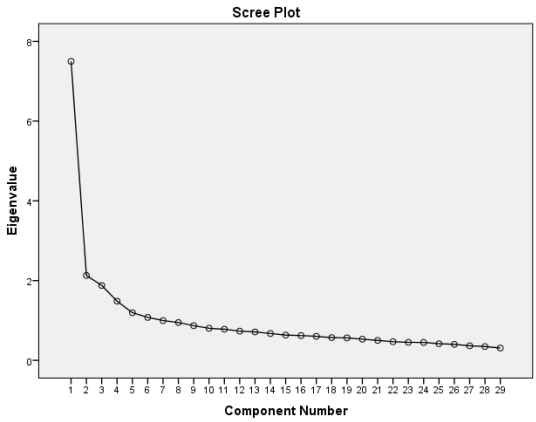

Figure 1. Social media addiction scale-student form self-value factor graph

From the analyses conducted, it was observed that the factors beyond the fourth point in the eigenvalue plot are small, close to each other, and similar. Therefore, the number of factors in the scale was limited to 4. Büyüköztürk et al. (2016) suggests that rapid declines or breakpoints in the eigenvalue plot would indicate the number of factors.

For the exploratory factor of the Social Media Addiction Scale, EFA was applied using principal component analysis and varimax method. The indicators for this procedure are presented in Table 5.

Table 5. EFA results for the Social Media Addiction Scale

Scale Item No	Factor Loadings Before Rotation	Factor Load Values				Item Total Correlation Value
		F1	F2	F3	F4	
M1	.60	.68				.60
M2	.62	.73				.60
M3	.65	.72				.53
M4	.43	.46				.45
M5	.51	.54				.57
M6	.49		.55			.61
M7	.49		.65			.59
M8	.57		.72			.46
M9	.43		.61			.45
M10	.55		.69			.47
M11	.44		.42			.60
M12	.47		.44			.53
M13	.55		.60			.53
M14	.64		.68			.66
M15	.58			.59		.58
M16	.63			.57		.54
M17	.57			.69		.67
M18	.46			.56		.55
M19	.50			.56		.54
M20	.39			.46		.48
M21	.41			.54		.53
M22	.60			.48		.48
M23	.52			.46		.44
M24.	.38				.43	.49
M25	.66				.63	.44
M26	.58				.66	.48
M27	.54				.59	.48
M28	.61				.47	.52
M29	.43				.46	.49

Explained Variance: F1: %16.92, F2: %14.58, F3: %13.87, F4: %10.69 Total: %56.08

As seen in Table 5, it was determined that the SMAS-SF has a structure consisting of 4 sub-dimensions (virtual tolerance, virtual communication, virtual problem and virtual knowledge) and 29 items. Virtual tolerance sub-dimension consists of items 1-5, virtual communication 6-14, virtual problem 15-23 and virtual information 24-29. The factor loadings of the items of the scale were found to vary between .42 and .73. According to Tabachnick and Fidell (2013), item loadings of .40 and above are considered "very good" and .70 and above are considered "excellent". As in the original, the adapted scale was structured under four factors with eigenvalues greater than 1. Büyüköztürk et al. (2016) recommends choosing values with eigenvalues greater than 1 and 1 in determining the factors. The total variance explained by these four factors is 56.08%. In this context, it can be said that the total variance value explained by the adapted scale is at a good level.

In Table 5, item discrimination levels were also tested by calculating the correlations between the scores obtained from each item in the factors and the scores obtained from the factors according to the item total correlation method. Thus, the ability of each item to serve the

general purpose of the scale and the relationships between the score obtained from each item and the score obtained from the overall scale were tested. When the item-test correlation coefficients are analyzed, it is seen that these coefficients are the validity coefficients of each item and indicate its consistency with the whole factor; in other words, the level of serving the general purpose of the factor.

One of the ways to determine the validity of the scale is to test the differences between the mean scores of the items for the top 27% and bottom 27% groups created based on total scores using an independent t-test. Finding a significant difference between the groups in the desired direction is considered as an indicator of the test's internal consistency (Büyüköztürk et al., 2016).

The significance of the difference between the item scores of the top 27% and bottom 27% groups based on the scale scores was examined to determine the extent to which each item in the scale is adequate in distinguishing students in terms of social media addiction. Based on the scale scores, the scores of 165 students starting from the lowest score and 165 students starting from the highest score were included, and the intermediate scores were not included in the analysis. The findings are presented in Table 6.

Table 6. Independent t-test Results for the Scores between the Top 27% Group and the Bottom 27% Group Regarding the Internal Consistency of the Social Media Addiction Scale

Scale Item No	Group	n	$\bar{x}$	SD	Df	T	p
M1	Bottom	165	3.27	1.001	328	-16.15	.000
	Top	165	3.90	0.824			
M2	Bottom	165	1.98	1.030	328	-16.37	.000
	Top	165	3.82	1.014			
M3	Bottom	165	2.63	1.226	328	-13.72	.000
	Top	165	4.22	0.851			
M4	Bottom	165	1.86	1.093	328	-12.21	.000
	Top	165	3.42	1.221			
M5	Bottom	165	1.78	0.913	328	-14.27	.000
	Top	165	3.40	1.141			
M6	Bottom	165	1.46	0.658	328	-15.08	.000
	Top	165	3.02	1.158			
M7	Bottom	165	1.19	0.463	328	-8.49	.000
	Top	165	1.95	1.051			
M8	Bottom	165	1.83	1.243	328	-10.90	.000
	Top	165	3.21	0.695			
M9	Bottom	165	2.02	1.203	328	-10.36	.000
	Top	165	3.39	1.207			
M10	Bottom	165	1.85	1.032	328	-11.67	.000
	Top	165	2.23	1.228			
M11	Bottom	165	1.39	0.686	328	-17.36	.000
	Top	165	3.29	1.235			
M12	Bottom	165	3.39	1.118	328	-11.25	.000
	Top	165	4.55	.578			
M13	Bottom	165	1.32	.561	328	-12.55	.000
	Top	165	2.65	1.244			
M14	Bottom	165	1.83	0.793	328	-21.27	.000
	Top	165	3.88	0.949			
M15	Bottom	165	1.85	0.932	328	-15.45	.000
	Top	165	3.70	1.221			
M16	Bottom	165	1.47	0.649	328	-12.82	.000
	Top	165	2.79	1.147			

M17	Bottom	165	1.48	0.695	328	-18.95	.000
	Top	165	3.35	1.507			
M18	Bottom	165	1.64	0.749	328	-13.29	.000
	Top	165	3.01	1.805			
M19	Bottom	165	1.27	0.545	328	-13.04	.000
	Top	165	2.55	1.129			
M20	Bottom	165	1.82	0.981	328	-11.23	.000
	Top	165	3.15	1.149			
M21	Bottom	165	1.33	0.691	328	-12.97	.000
	Top	165	2.86	1.352			
M22	Bottom	165	2.17	1.182	328	-11.26	.000
	Top	165	3.57	1.072			
M23	Bottom	165	1.79	0.997	328	-11.33	.000
	Top	165	3.12	1.118			
M24	Bottom	165	1.96	1.078	328	-11.11	.000
	Top	165	3.31	1.130			
M25	Bottom	165	3.78	1.025	328	-5.01	.000
	Top	165	4.26	.680			
M26	Bottom	165	3.28	1.209	328	-5.24	.000
	Top	165	3.90	0.912			
M27	Bottom	165	2.22	1.114	328	-7.76	.000
	Top	165	3.23	1.208			
M28	Bottom	165	2.79	1.276	328	-5.47	.000
	Top	165	3.51	1.091			
M29	Bottom	165	2.19	1.035	328	-11.73	.000
	Top	165	3.56	1.084			

* p<.001

When Table 6 is examined, it is observed that there is a significant difference between the mean scores ($\bar{x}$) of the lower and upper groups in terms of social media addiction (p=0.000<.001). This significant difference favors the upper group. Based on this finding, it can be said that the scale distinguishes between students with and without social media addiction, indicating its internal validity.

Confirmatory Factor Analysis Findings

EFA was conducted to determine the validity of the scale, and the first and second CFA analyses were conducted to test the accuracy of the 4-dimensional structure. CFA was conducted on data collected from students other than the sample used for EFA. In Confirmatory Factor Analysis, latent variables represent a theoretical structure, while observed measurements are designed as indicators of this structure (Jöreskog and Sörbom, 1993). Based on this, an equality modeling was established to predict the 4-factor structure consisting of 29 items identified through EFA accurately.

As a result of the Confirmatory Factor Analysis (CFA), it was determined that the Chi-Square ($\chi 2$) value, which varies according to the sample size, is 1670.24 with 369 degrees of freedom (df). The ratio of $\chi 2/df$ is 4.52. It can be said that this value means acceptable fit (Kline, 2005). In addition, model fit criteria such as RMSEA (Root Mean Square Error of Approximation), SRMR (Standardized Root Mean Square Residual), GFI (Goodness of Fit Index), AGFI (Adjusted Goodness of Fit Index), CFI (Comparative Fit Index), and NFI (Normed Fit Index) were considered to assess the fit of the structure. For the model to be appropriate, the RMSEA value, which should be below 0.08 (Browne & Cudeck, 1993), was found to be 0.076, and the SRMR value, which should be below 0.10 (Kline, 2005), was found to be 0.071. RMSEA and SRMR values close to zero indicate model perfection (Brown, 2006; Byrne, 2010). In addition, the GFI value, which should be 0.90 and above if

the model is appropriate (Kline, 2005), was 0.90 and the AGFI value was 0.91. GFI and AGFI values can range between 0 and 1, should be closer to 1, and cannot be negative (Jöreskog & Sörbom, 1993; Raykov & Marcoulides, 2006). The NFI value, which should be close to 1 between 0 and 1 for an appropriate model (Kline, 2005; Raykov & Marcoulides, 2006), was found to be 0.90, and the CFI value, which should be close to 1 between 0 and 1 (Brown, 2006; Byrne, 2010; Raykov & Marcoulides, 2006), was found to be 0.92. Based on the obtained data, it it is seen that the model has been confirmed.

As can be seen in Figure 2, factor loadings vary between .38 and .72 for the virtual tolerance sub-dimension, .36 and .65 for the virtual communication sub-dimension, .42 and .68 for the virtual problem sub-dimension, and .31 and .66 for the virtual information sub-dimension.

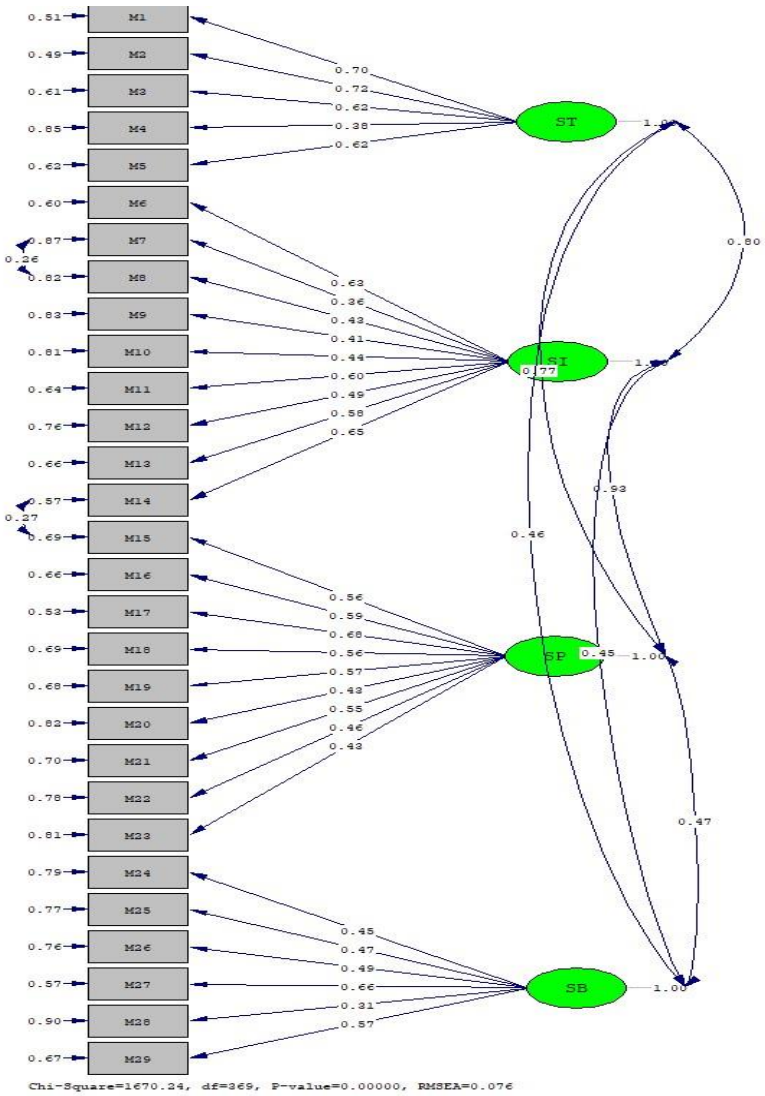

Figure 2. Correlation Diagram for First-Level Confirmatory Factor Analysis (Standardized)

The t-values obtained from the first-level confirmatory factor analysis are presented in Table 6.

Table 6. First Level Confirmatory Factor Analysis *t*-Test Values

Scale Item	*t*	Scale Item	*t*	Scale Item	*t*	Scale Item	*t*
M1	18.16**	M9	9.95**	M17	18.10**	M25	10.44**
M2	18.71**	M10	10.60**	M18	14.04**	M26	10.74**
M3	15.64**	M11	15.45**	M19	14.29**	M27	14.90**
M4	8.95**	M12	12.06**	M20	10.32**	M28	6.67**
M5	15.44**	M13	14.82**	M21	13.68**	M29	12.76**
M6	16.27**	M14	17.12**	M22	11.36**		
M7	8.59**	M15	14.18**	M23	10.47**		
M8	10.32**	M16	14.91**	M24	9.92**		

**p<.001

According to the findings in Table 6, the t values of the items in the Social Media Addiction Scale ranged between 6.67 and 18.71. The calculated t-values being greater than 1.96 indicate significance at the .05 level, and values greater than 2.58 indicate significance at the .01 level (Jöreskog & Sörbom, 1993; Kline, 2005). Accordingly, all t values obtained in the first level confirmatory factor analysis were found to be significant at .01 level.

The second-level confirmatory factor analysis was conducted to demonstrate that the four factors obtained from the first-level confirmatory factor analysis represent the latent variable of virtual addiction, defined as the overarching structure. The second-level factor model was tested by adding the second-level variable to the first-level confirmatory structure, consisting of four latent and 29 observed variables. The connection diagram for the second-level confirmatory factor analysis of the scale is presented in Figure 3.

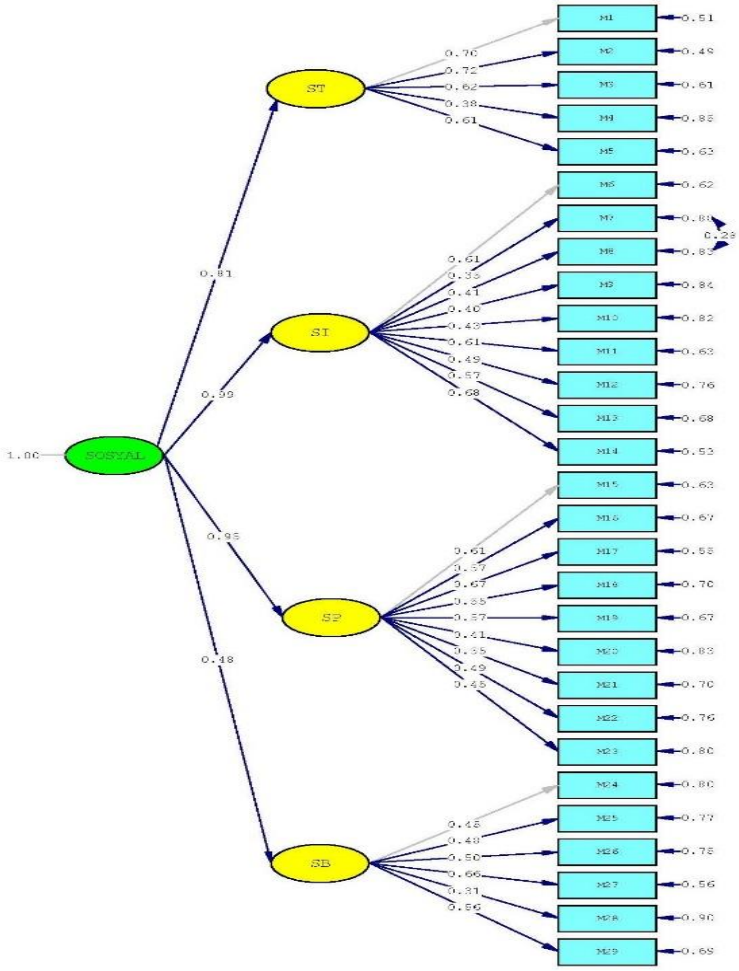

Figure 3. Second Level Confirmatory Factor Analysis Correlation Diagram (Standardized)

The factor loadings obtained from the second-level confirmatory factor analysis model are shown in Figure 4.3. The factor loadings range between .38 and .72 for the virtual tolerance subscale, between .36 and .68 for the virtual communication subscale, between .41 and .67 for the virtual problem subscale, and between .31 and .66 for the virtual information subscale.

After the standard solutions, t values between factors and items were examined. Jöreskog and Sörbom (1993) state that the absence of a red arrow in the t values indicates that all items are significant at the .05 level. Therefore, the absence of red arrows in the t-values indicates that all items are significant at the .05 level.

The Table 7 presents the goodness-of-fit indices obtained from the first and second-level-confirmatory factor analyses along with the criteria for perfect and acceptable fit.

Table 7. Values of Fit Indices and Goodness of Fit Index (GFI) Obtained from CFA

Inspected FitIndices	Perfect Fit	Acceptable Fit	First Level Confirmatory Factor Analysis Fit Indices	Second Level Confirmatory Factor Analysis Fit Indices
$\chi 2/sd$	$0 \leq \chi 2/sd \leq 2$	$2 \leq \chi 2/d<5$	4.52	4.24
RMSEA	$0 \leq RMSEA \leq 0.05$	$0.05 \leq RMSEA \leq 0.08$	0.078	0.075
S-RMR	$0 \leq S\text{-}RMR \leq 0.05$	$0.05 \leq S\text{-}RMR \leq 0.10$	0.071	0.070
NFI	$0.95 \leq NFI \leq 1.00$	$0.90 \leq NFI \leq 0.95$	0.90	0.90
CFI	$0.97 \leq CFI \leq 1.00$	$0.95 \leq CFI \leq 0.97$	0.96	0.96
GFI	$0.95 \leq GFI \leq 1.00$	$0.90 \leq GFI \leq 0.95$	0.90	0.90
AGFI	$0.95 \leq AGFI \leq 1.00$	$0.90 \leq AGFI \leq 0.95$	0.91	0.91

According to the findings in Table 7, it can be observed that the goodness-of-fit indices for both the first and second-level confirmatory factor analyses are at an acceptable level. This indicates that the structural validity of the Social Media Addiction Scale has been confirmed.

Reliability Analysis Findings

The reliability of the scale according to the factors and overall was calculated using Cronbach Alpha reliability coefficient, correlation value between two halves, Sperman-Brown formula and Guttmann split-half reliability formulas. Reliability analysis values for the overall scale and its factors are presented in Table 8.

Table 8. Social media addiction scale-student form's reliability coefficients

Factors	Item No	Peer-to-Peer Correlations	Sperman Brown	Guttmann Split-Half	Cronbach Alpha
Virtual Tolerance	5	.63	.64	.60	.73
Virtual Communication	9	.67	.67	.66	.78
Virtual Problem	9	.75	.75	.74	.79
Virtual Information	6	.60	.60	.60	.65
Total	29	.81	.81	.80	.89

As can be seen in Table 8, the scale, which consists of four factors and 29 items, was found to be .81; Sperman Brown reliability coefficient .81; Guttmann Split-Half value .80 and Cronbach Alpha reliability coefficient .89. On the other hand, it is seen that split-half correlations for the factors range between .60 and .75, Spearman-Brown coefficients range between .60 and .75, Guttmann Split-Half values range between .60 and .74, and Cronbach's Alpha values range between .65 and .79. Based on these values, it can be concluded that the data pertaining to split-half correlations, Spearman-Brown coefficients, Guttmann Split-Half values, and Cronbach's Alpha coefficients indicate that both the overall scale and its subscales yield reliable results.

Consistency Level

The test-retest method was used to statistically test the stability of the SMAS-SF in terms of its quality over time. Test-retest reliability assesses the stability of a measurement instrument over a specific time interval (Büyüköztürk et al., 2016). In order to determine the test-retest reliability coefficient of the scale, it was applied to a group of 224 university students with a two-week interval between applications. Pearson product-moment correlation coefficient was used to test the stability between the two applications. The findings are given in Table 9.

Table 9. Social media addiction scale-test-retest reliability coefficient of student form

	Virtual Tolerance	Virtual Communication	Virtual Problem	Virtual Information	Total
Virtual Tolerance	.88**				
Virtual Communication		.89**			
Virtual Problem			.91**		
Virtual Information				.90**	
Total					.94**

n=224; **p<.01

As seen in Table 9, a high level of positive and significant correlation was found between the two administrations for the overall scale (r=.94; p<.01), as well as for the sub-dimensions: virtual tolerance (r=.88; p<.01), virtual communication (r=.89; p<.01), virtual problem (r=.91; p<.01), and virtual information (r=.90; p<.01). A reliability coefficient calculated for a psychological test falling within the range of .70 to .89 indicates that the scale is highly reliable (Kalaycı, 2009). Thus, both the overall SMAS-SF and its sub-dimensions are capable of providing stable measurements.

Based on all the conducted analysis results, it can be said that the "Social Media Addiction Scale-Student Form (SMAS-SF)" is a valid and reliable scale.

The Scoring of the Scale

The lowest score that can be obtained from the scale is 29 and the highest score is 145. A high score indicates that the student is perceived as a "social media addict".

The level of dependency is determined by subtracting the lowest score from the highest score obtained from the scale and dividing the resulting score by 5 to categorize dependency levels as "no dependency", "low dependency", "moderate dependency", "high dependency", and "very high dependency". The following formula can be used to calculate categorical scores: (Estimated range coefficient = Scale highest score - Scale lowest score / Category). Accordingly, the overall scale and subscale score categories are calculated by multiplying the obtained range value by the number of scale items (Jaafar et al., 2017). To facilitate reaching the target score, the range coefficient is calculated by subtracting 1 point from the obtained score.

Accordingly, the dependency levels according to the scores in Table 10 were used in the analysis of this study.

Table 10. Evaluation of Social Media Addiction Scale and Sub-dimensions

Addiction Level	SMAS (Total) (1-29)	Virtual Tolerance (1-5)	Virtual Communication (6-14)	Virtual Problem (15-23)	Virtual Information (24-29)
No addiction	29.00-52.19	5,00-8,99	9.00-16,19	9.00-16,19	6.00-10.79
Low	52.20-75.39	9,00-12,99	16.20-23.39	16.20-23.39	10.80-15.59
Medium	75.40-98.59	13,00-16,99	23.40-30.59	23.40-30.59	15.60-20.39
Highly	98.60-21.79	17,00-20,99	30.60-37.79	30.60-37.79	20.40-25.19
Very Highly	121.80-145.00	21,00-25,00	37.80-45.00	37.80-45.00	25.20-30.00

Discussion, Conclusion and Recommendations

Upon reviewing the literature, it is found that in many countries, there is no specific scale to determine social media addiction among university students. Some of the available

scales measure individuals' purposes for using social media (Acun et al., 2017), the level of social network usage (Doğan and Karakaş, 2016; Toraman, 2013), social media attitudes (Otrar and Argın, 2015), and tendencies towards social media addiction (Wilson et al., 2010). However, various scales for determining social media addiction have been identified in Türkiye. Some of these include the scale developed by Van den Eijnden et al. (2016) and adapted into Turkish by Taş (2017), as well as the Social Media Addiction Scales developed by Tutgun-Ünal (2015), Şahin and Yağcı (2017), Ayğar and Uzun (2018), and Şahin (2018). However, no scale specifically designed to determine social media addiction among university students has been found in Azerbaijan.

As a result of the literature review, it has been determined that Şahin (2018) developed a scale consisting of student participants aimed at detecting social media addiction among students. Accordingly, the aim of this study is to adapt the Social Media Addiction Scale: Student Form developed by Şahin (2018) into Azerbaijani Turkish and to examine its validity and reliability in a sample of university students.

After determining the scale to be adapted, contact was made with Şahin (2018), the developer of the scale. Information about the scope and purpose of the research was provided, and permission for the use of the scale was obtained. Following the completion of the permission process, the adaptation process was initiated.

The scale was translated into Azerbaijani Turkish, translated back to the original and made ready for pre-application. In this study, the original scale was first translated into Azerbaijani Turkish by two different Turkish-speaking faculty members who are experts in the field of psychology and have studies on addiction. The Turkish translated scale was again translated into Turkish by two experts in the field and fluent in both languages and compared with the original scale. To determine the comprehensibility of the resulting scale by students, it was administered to 30 university students. The analysis revealed that all items in the scale were understandable to the participants.

In the research, all analyses related to the data were conducted in appropriate order, taking into account the fundamental principles of scale adaptation. Firstly, tests for normality, missing values, outliers, KMO, and Bartlett's sphericity were applied. Then, the Exploratory Factor Analysis (EFA) was conducted. Subsequently, Confirmatory Factor Analysis (CFA) was performed. Cronbach's alpha internal consistency test was conducted to determine the reliability coefficient.

First of all, the suitability of the data obtained from the study group for factor analysis was examined. Kurtosis and skewness values of the data values obtained were calculated. When the skewness and kurtosis values calculated over the total score and sub-dimensions of the Social Media Addiction Scale were examined, the skewness value for the overall scale was calculated as .14 and the kurtosis value was calculated as .32; for the sub-dimensions, the skewness values were calculated as -.24, .35; kurtosis values were calculated as -.39, .58, respectively. According to the obtained data, it can be seen that the data are normally distributed. After these procedures, KMO and Bartlett test results were examined to determine the suitability of the sample size of the scale for the selected analysis. In the study, it was determined that the KMO test value was .90 and the Bartlett test value was $\chi 2=5401.19$; sd=406 (p=.000). These results indicate that the data are suitable for factor analysis. Exploratory factor analysis (EFA) was then performed using principal component analysis with varimax rotation to identify the factors of the scale. It was observed that, similar to the original scale, the adapted scale was structured under four factors with eigenvalues greater

than 1. The total variance explained by these four factors is 56.08%. In this context, it can be said that the adapted scale has a good level of explained total variance.

EFA was conducted to determine the validity of the scale, and the first and second CFA analyses were conducted to test the accuracy of the 4-dimensional structure. CFA was conducted on data collected from students other than the sample used for EFA. Based on this, an equation modeling was established to confirm that the 4-factor structure consisting of 29 items identified by EFA could be accurately predicted. As a result of CFA, it was determined that the Chi-Square ($\chi 2$) value, which varies according to the sample size, was 1670.24 and the degree of freedom (df) was 369. The $\chi 2/df$ is 4.52. It can be said that this value means acceptable fit. Based on the data obtained, it is seen that the model is validated. It is seen that the perfect and acceptable fit criteria for the fit indices examined in the study and the fit indices obtained from the first and second level confirmatory factor analysis are at an acceptable level. In determining the discrimination of the items, 27% top and bottom groups were determined and the difference between the groups was examined and it was concluded that the discrimination levels were high in terms of each item, factor and total score. This indicates that the construct validity of the Social Media Addiction Scale was confirmed.

Finally, the scale, which consisted of four factors (virtual tolerance, virtual communication, virtual problem, virtual information) and 29 items, was found to be .81; Sperman Brown reliability coefficient .81; Guttmann Split-Half value .80 and Cronbach Alpha reliability coefficient .89. On the other hand, it is seen that split-half correlations for the factors range between .60 and .75, Spearman-Brown coefficients range between .60 and .75, Guttmann Split-Half values range between .60 and .74, and Cronbach's Alpha values range between .65 and .79. Accordingly, the data related to the split-half correlation, Sperman Brown, Guttmann Split-Half and Cronbach Alpha reliability coefficients show that the whole scale and its sub-dimensions are reliable. In addition, Cronbach's Alpha and test-retest reliability coefficients were used to examine the reliability of the measurements. A highly positive and significant relationship was found between the two applications for the overall scale ($r=.94$; $p<.01$), for the virtual tolerance sub-dimension ($r=.88$; $p<.01$), for the virtual communication sub-dimension ($r=.89$; $p<.01$), for the virtual problem sub-dimension ($r=.91$; $p<.01$) and for the virtual information sub-dimension ($r=.90$; $p<.01$). Thus, it was determined that the SMAS-SF and its subscales are capable of producing stable measurements.

According to the validity and reliability results of the Social Media Addiction Scale-Student Form, it can be said that the Azerbaijani Turkish form of the scale (appendix-1) is suitable for use in university students.

It can be said that this scale adapted to Azerbaijan Turkish will facilitate the studies investigating the social media addiction of university students.

The research was conducted on university students studying in Baku. In order to ensure the external validity of the research, the validity and reliability of the scale can be retested with participants from different regions.

Using the scale to determine the level of social media addiction among university students is recommended.

When reviewing the international literature, it is observed that the relationship between social media addiction and various issues such as loneliness, depression, anxiety, self-esteem, life satisfaction, narcissism, communication skills, academic success, eating disorders, and sleep

disorders has been examined. With the adapted scale, studies on all of these topics can be conducted in Azerbaijan.

Note

This study is derived from a master's thesis prepared by the first author under the supervision of the second author

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Appendix-1

Sosyal Medya Asılılığı Şkalası- Tələbə Formu

AÇIQLAMA: Aşağıda sosial şəbəkələrin istifadəsinə dair fərqli situasiyalar qeyd edilmişdir. Hər ifadəni diqqətlə oxuyub sizə uyğun olan ifadəni (**X**) işarələməyiniz xahiş olunur. Zəhmət olmasa, bütün bəndləri oxuyub işarələyin.		① Mənə heç uyğun deyil ② Mənə uyğun deyil ③ Qərarsızam ④ Mənə uyğundur ⑤ Mənə çox uyğundur				
1	Sosial şəbəkəyə daxil olmaq üçün səbirsizlənirəm	①	②	③	④	⑤
2	Sosial mediaya daxil olmaq üçün hər yerdə internet bağlantısı axtarıram.	①	②	③	④	⑤
3	Səhər yuxudan duranda ilk işim sosial şəbəkəyə daxil olmaq olur.	①	②	③	④	⑤
4	Mən sosial şəbəkəni real dünyadan qaçış kimi görürəm.	①	②	③	④	⑤
5	Sosial şəbəkəsiz həyat mənim üçün mənasızdır.	①	②	③	④	⑤
6	Ətrafımda insanlar olanda belə sosial şəbəkədə olmağı üstün tuturam.	①	②	③	④	⑤
7	Sosial şəbəkədə olan dostluğu real həyatdakı dostluqdan üstün sayıram.	①	②	③	④	⑤
8	Sosial şəbəkədə ünsiyyət qurduğum insanlara özümü daha yaxşı ifadə edirəm.	①	②	③	④	⑤
9	Sosial şəbəkədə görünmək istədiyim kimi oluram.	①	②	③	④	⑤
10	Mən adətən sosial şəbəkə vasitəsilə insanlarla ünsiyyət qurmağa üstünlük verirəm.	①	②	③	④	⑤
11	Ailəm buna qarşı olsa belə, sosial şəbəkədən istifadəni dayandıra bilmirəm.	①	②	③	④	⑤
12	Tək olanda sosial şəbəkədə vaxt keçirməyi xoşlayıram.	①	②	③	④	⑤
13	Mən çölə çıxmaqdansa sosial şəbəkədə virtual ünsiyyətə daha çox üstünlük verirəm.	①	②	③	④	⑤
14	Sosial şəbəkə fəaliyyətləri gündəlik həyatımı zəbt edir.	①	②	③	④	⑤
15	Sosial şəbəkədə çox vaxt keçirdiyim üçün ev tapşırıqlarını gecikdirirəm.	①	②	③	④	⑤
16	Sosial şəbəkəyə sərf etdiyim vaxtı azaltmalı olsam, məyus olardım.	①	②	③	④	⑤
17	Sosial şəbəkədə olmayanda kefsiz oluram.	①	②	③	④	⑤
18	Sosial şəbəkədə olmaq məni həyəcanlandırır.	①	②	③	④	⑤
19	Sosial şəbəkədən tez-tez istifadə etdiyim üçün ailəmlə problemlər yaşayıram.	①	②	③	④	⑤
20	Sosial şəbəkənin sirli dünyası məni həmişə valeh edir.	①	②	③	④	⑤
21	Sosial şəbəkədə olanda ac-susuz olduğumun fərqində belə olmuram.	①	②	③	④	⑤
22	Sosial şəbəkəyə görə məhsuldarlığımın azaldığını müşahidə edirəm.	①	②	③	④	⑤
23	Sosial şəbəkədən istifadə etmək səhhətimdə problemlər yaradır.	①	②	③	④	⑤
24	Ani məlumatlardan xəbərdar olmaq üçün yolda yeriyərkən belə sosial şəbəkədən istifadə edirəm.	①	②	③	④	⑤
25	Baş verənlərdən xəbərdar olmaq üçün sosial şəbəkədən istifadə etməyi sevirəm.	①	②	③	④	⑤
26	Sosial şəbəkə qruplarının paylaşımlarından xəbərdar olmaq üçün sosial şəbəkəyə göz gəzdirirəm.	①	②	③	④	⑤
27	Bəzi xüsusi elanları (ad günü və s.) görmək üçün sosial şəbəkədə daha çox vaxt keçirirəm.	①	②	③	④	⑤
28	Dərslərimlə bağlı (ev tapşırığı, fəaliyyətlər və s.) məlumatlı olmaq məni daim sosial şəbəkədə qalmağa məcbur edir.	①	②	③	④	⑤
29	Yaxın ətrafımın paylaşımlarından dərhal xəbərdar olmaq üçün sosial şəbəkədə daim aktivəm.	①	②	③	④	⑤