

FACTOR ANALYSIS OF EFFECTS OF SOCIAL MEDIA ON YOUTH: A CASE STUDY OF UNIVERSITY OF SARGODHA

Anam Iqbal¹, Asad Ali², Kanwal Iqbal³

¹G.C.W Shahpur Sargodha, ²Department of Statistics, University of Sargodha, ³ Department of Quantitative Method SBE (School of Business and Economics), University of Management and Technology, Lahore, PAKISTAN.

¹anamughal343@gmail.com, ²ranaasadali23@gmail.com

ABSTRACT

A survey study was conducted for analyzing the usage and effects of social media on youth. The study focused on constructing new factors for usage of information technology in social media affecting youth by using factor analysis. The data was collected through questionnaire. By using simple random sampling, sample of 380 students was selected from University of Sargodha, Punjab, Pakistan. Six new latent clusters of usage and effects of social media named as 1) Influences on health 2) Learning through communication and skills 3) Facilitator for youth in business field 4) Wastage of time 5) Source of entertainment for youth interest 6) Increase in the level of awareness are identified by using factor analysis. Further, Kruskal-Wallis test is used to test differences in means of demographic factors on new six factors. It is found that social media has enhanced learning, efficiency, skills and level of awareness but there are also some negative impacts on youth. There exists significant mean difference between genders on these factors. Results also revealed that significant mean difference exists among age categories that is age influences on usage of social media.

Keywords: Factor Analysis, Descriptive Analysis, Kruskal-Wallis, Demographic Factors

INTRODUCTION

Social media is a very broad term. Social media means web-based instruments that enables users to interact with others by sharing information with them and receiving information from them. From the beginning of 21st century, use of social media is increasing gradually with high rate everywhere in the world. People from different age groups use social media. Social media influences people life styles, educational awareness, trends, social life, physical activities, different religious practices, and political awareness and so on.

Social media is a way of communication among people. People generate, interchange and share thoughts and knowledge in virtual communities and networks. It is unavoidable for majority of organizations worldwide see (Sabir et al., 2014).

Adolescents and teenagers are among the heaviest users of social networking. Social media effects youth on both ends good and bad. When youth incorporates themselves in immoral activities on social media gateway and share futile information then negative use of social media occurs. Ten years ago, young people were in touch with friends and other people at school, colleges, and meetings. Now through instant social networking people can be in touch with each other and they are growing up in a constantly connected society.

Hence it is significant to study the effects of social media on youth. In this work factor analysis is utilized to analyze factors of usage of social media affecting youth. Moreover, through Kruskal-Wallis test mean differences are quantified, to examine the average demographic differences on new factors.

LITERATURE REVIEW

(Livingstone and Bober, 2003) stated that social media was the main cause of generation gap in many ways such as lack of awareness, recognition of domestic rules and in what children have really-acting and what have parent's opinion about their children doing. (Kalpidou et al., 2011) stated that there was a relationship between social media and grades. The students who spent their time on social media have low grades than those who did not spend their time on social media. According to (Waddington, 2011) adolescent take social media as the component of their culture not a craze and they think, it can enhance their ability and they use it as educational tool. (Kulandairaj, 2014) stated that social media has positive and negative effects on youth. He said that social media provides awareness and influences lifestyle of youth. Also, it develops a healthy young generation as it promotes healthy life style through its posts, videos and messages. (Reshma, 2014) described that, due to social networking sites, mindset of the youth has been changed.

(Khurana, 2015) presented that too much use of social networking sites such as Facebook, Twitter, Wing, LinkedIn, Myspace and Skype, has been shifted the attention of youth from real to virtual world and from visible to invisible friends. (Shetty et al., 2015) presented that as favorite form of social media Facebook was on first, Skype was on second, Twitter was on third, YouTube was on fourth and Myspace was on last. They showed the main problem was, social media promotes unwanted messages, unethical pictures and videos, anti-religious posts and links among people of different communities which cause deterioration of relationship among countries. (Ali et al., 2016) proposed that use of information technology in social media has been increased its popularity among youth especially among the students of universities and it played vital role in providing learning and job opportunities to the students.

METHODOLOGY

The data is collected through randomly distributed questionnaire. SPSS (Statistical Package for the Social Sciences) is exerted to perform statistical analysis of collected data. First descriptive analysis is performed and statistics are measured in the form of frequency and percentages. (McClave et al., 2005) described that descriptive statistics summarize data set in numerical and graphical form that was easily understandable. The internal consistency of scales is determined through reliability analysis by using Cronbach's Alpha see (Sheridan and Ong, 2011). The reliability test formula as stated by (Fraenkel and Wallen, 1996) is as follows:

$$r_{kk} = \left(\frac{k}{k-1} \right) \cdot \left(1 - \frac{s_i^2}{s_x^2} \right), \quad (1)$$

where,

r_{kk} = Predicted Cronbach Alpha coefficient

k = No. of objects in the questionnaire

s_i^2 = Sum of item variances

s_x^2 = Factor variances

KMO (Kaiser-Mayer-Olkin) test is utilize to determine whether data is fit for factor analysis or not, and then factor analysis is used to summarize data so that relationships between variables and patterns can be easily understood. (Norusis, 1994) suggested KMO test formula as:

$$\psi = \begin{bmatrix} \psi_1 & 0 & \dots & 0 \\ 0 & \psi_2 & 0 & 0 \\ \vdots & \vdots & \ddots & \vdots \\ 0 & 0 & \dots & \psi_p \end{bmatrix} \text{ with } \hat{\psi}_i = S_{ii} - \sum_{j=1}^m l_{ij}^2 \quad (8)$$

Furthermore, Kruskal-Wallis test is performed on new constructed latent variables. According to (Carver and Nash, 2006) Kruskal-Wallis test is a non-parametric form of one factor independent measures ANOVA. (Newbold et al., 2003) stated Kruskal-Wallis test statistic as:

$$W = \frac{12}{n(n+1)} \sum_{i=1}^k \frac{R_i^2}{n_i} - 3(n+1) \quad (9)$$

where,

K = No. of clusters derived after creating classes

n_i = No. of observations in each cluster

N = Total No. of observations

R_i = Sum of ranks for each cluster

RESULTS

In this study, 380 students have participated and served as the primary source of information for the investigation of this research. The results are divided in to the different subsections.

Descriptive Statistics

Table 1 shows demographic profile of respondents according to age and gender. According to gender, 49% of respondents are male and 51% of respondents are female. According to age most of the respondents age ranges between 17 to 20 years old. 53% of the respondents are 19 to 20 years old, 27% are 17 to 18 years old and 20% are 20 above.

Table 1. Demographic Outline of the respondents

		Gender		Total	Percentage
		Male	Female		
Age	17-18	26	78	104	27.4
	19-20	102	98	200	52.6
	20 above	57	19	76	20.0
	Total	185	195	380	100
	Percentage	48.7	51.3	100	

Results reveal that out of 380 respondents, 185 are male and 195 are female, 104 respondents are from 17-18 age group, 200 from 19-20 age group and 76 respondents are 20 above. Out of 185 male participants, 26 are 17 to 18 years old, 102 are 19 to 20 years old and 57 are 20 above. Out of 195 female participants, 78 are 17 to 18 years old, 98 are 19 to 20 years old and 19 are 20 above.

Reliability Analysis

According to (Abu and Tasir, 2001) reliability coefficient greater than 0.60 is forever good to use. (Kroz et al., 2008) presented that for questionnaire, Cronbach’s alpha should be between 0.65 until 0.75. Table 2 reveals that Cronbach’s Alpha is 0.649 for 15 items, it means there is internal consistency of scale.

Table 2. Reliability Figures

<i>Cronbach Alpha</i>	<i>No. of Items</i>
0.649	15

Factor Analysis

Factor analysis is utilized to discover number of factors of usage of social media which are affecting youth. For factor analysis, suitability of data is examined by utilizing Kaiser-Mayer-Olkin (KMO) test and Bartlett’s test of sphericity. Both tests measure sampling adequacy for each variable in the model and quantify strength of relationship among variables. Null hypothesis for Bartlett’s test is that correlation matrix is an identity matrix.

Table 3. KMO and Bartlett's Test

	<i>KMO Test</i>	0.625
	Approx. Chi-Square	994.710
<i>Bartlett's Test</i>	d. f.	105
	Significant value	0.000

Table 3 indicates that KMO measure is 0.625, which is larger than 0.60 and Bartlett’s test of sphericity is statistically significant. It is proposed that if Bartlett’s test of sphericity is statistically significant and Kaiser-Mayer-Olkin (KMO) is more than 0.60 then factorability is suitable see (Sheridan and Ong, 2011). So, results reveal that to examine new factors of usage of social media affecting youth it is acceptable to proceed with factor analysis.

Table 4 displays extracted factors along with their eigen values and total variation explained at 6 stages for factors. Six factors are extracted from 15 variables because their eigen values are greater than one. As extracted factors explain 65% of the variability in original 15 variables, so complexity of data can be reduced by using these factors.

Table 4. The Total Explained Variance

<i>Factor</i>	<i>Rotation SS Loadings</i>		
	<i>Total</i>	<i>% of Variance</i>	<i>Cumulative %</i>
1	1.890	12.602	12.602
2	1.789	11.929	24.531
3	1.787	11.912	36.443
4	1.698	11.322	47.765
5	1.323	8.822	56.588

6	1.272	8.479	65.066
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Table 5 shows loading of 15 variables on 6 extracted factors. The larger the absolute value of loading indicates that factor pays more to the variable. According to (Tabachnick and Fidell, 2001) a rotated factor loading equals to 0.45 is assessed average however loadings 0.32 is measured less decent.

Table 5. Rotated Factor Matrix

Item	Factor					
	1	2	3	4	5	6
X ₁	0.836					
X ₂	0.734					
X ₃	0.586		0.435			
X ₄		0.743				
X ₅		0.717				
X ₆		0.615		0.416		
X ₇			0.678			
X ₈			0.655			
X ₉	0.430		0.500			
X ₁₀				0.824		
X ₁₁				0.648		
X ₁₂				0.504		
X ₁₃					0.797	
X ₁₄		0.433			-0.583	
X ₁₅						0.865

Varimax rotation method with Kaiser Normalization is performed and it is found that factor 1 consists of 3 variables with factor loadings varying from 0.586 to 0.836. The variables in factor 1 are X₁, X₂ and X₃. Factor 2 comprises of 3 items with factor loadings varying from 0.615 to 0.743. The items in factor 2 are X₄, X₅ and X₆. Factor 3 comprises of X₇, X₈ and X₉ with factor loadings varying from 0.500 to 0.678. Factor 4 consists of 3 items with factor loadings ranging from 0.504 to 0.824. The items in factor 4 are X₁₀, X₁₁ and X₁₂. Each of factor 5 and factor 6 comprises of one item. Factor 5 contains X₁₃ with factor loading 0.797 and factor 6 contains X₁₅ with factor loading 0.865.

By using factor analysis, six new factors are constructed and assigned as factors of usage of social media affecting youth. Table 6 represents the title of new factors and proportion of variation accounted for by each factor. Highest percentage of the variance i.e. 12.602% is explained by first factor when it is extracted.

Table 6. Title of New Factors with % of Variation

Factor	Title	% of Variation
1	Influences on Health	12.602

2	Learning through communication and skills	11.929
3	Facilitator for youth in business field	11.912
4	Wastage of time	11.322
5	Source of entertainment for youth interest	8.822
6	Increase in the level of awareness	8.479

Normality Test

To explore the normality of 6 new factors Kolmogorov-Smirnov test is utilized. Table 7 shows the normality test results for six new factors of usage of social media affecting youth. It is found that normality assumption is not fulfilled by these factors as the p-value of test statistic is fewer than 0.05.

Table 7. Normality Test for New Factors

Factor	Statistic	d. f.	P-value
1	0.109	379	0.010
2	0.107	379	0.010
3	0.118	379	0.010
4	0.099	379	0.010
5	0.067	379	0.010
6	0.125	379	0.010

Kruskal-Wallis Test

As six new factors did not fulfill the assumption of normality, therefore a non-parametric Kruskal-Wallis test is utilize to test the mean difference of demographic factors on the six new factors of usage of social media affecting youth. In this study gender and age are demographic factors, which are analyzed. The null hypothesis is that there is no statistically significant mean difference between sexual category on factors of social media that are affecting youth or six factors not differ in gender.

Table 8. Kruskal-Wallis Test between Sexual category

Factor	Chi Square	Asymptotic Sig.
1	0.004	0.950
2	8.530	0.003
3	4.617	0.032
4	0.980	0.322
5	0.288	0.591
6	9.767	0.002

Table 8 represents kruskal-Wallis test results for 6 new factors. It is observed that there is statistically significant mean difference between sexual category on learning through communication and skills as p-value of test statistic for factor 2 is less than 0.05. Also facilitator for youth in business field and increase in the level of awareness differ in gender as the p-value of test statistic for these factors is less than 0.05. The results also show there is no statistically significant mean difference between sexual category on the other factors.

Table 9. Mean Rank between Sexual category

			N	Mean Rank
<i>Factor 2</i>	Gender	Male	185	207.39
		Female	195	174.47
<i>Factor 3</i>	Gender	Male	185	202.93
		Female	195	178.71
<i>Factor 6</i>	Gender	Male	185	172.42
		Female	195	207.65

Table 9 shows the mean rank between genders for factor 2, factor 3 and factor 6. The mean rank of learning through communication and skills, for male students is 207.39 which is the highest mean rank. It means male students learn more through communication and skills as compare to female students. Similarly, mean rank of facilitator for youth in business field for male students is high and for female students is low. Female students have highest mean rank for increase in the level of awareness as compare to male students.

Another null hypothesis is that there is no statistically significant mean difference amongst age groups on factors of usage of social media affecting youth or six factor not differ in age. Table 10 exhibits that there is statistically significant mean difference amongst age groups on influences on health, learning through communication and skills, and increase in the level of awareness as their p-values are less than 0.05. There is no significant mean difference among age categories on facilitator for youth in business field, wastage of time and source of entertainment for youth interest.

Table 10. Kruskal-Wallis Test among Age Groups

Factor	Chi Square	Asymptotic Sig.
1	22.235	0.000
2	11.370	0.003
3	0.134	0.935
4	1.120	0.571
5	1.349	0.509
6	18.862	0.000

Table 11 shows the mean rank for significant factors. The age group 20 above has highest mean rank for influences on health, learning through communication and skills, and for increase in the level of awareness, it means age matter in the usage of social media.

Table 11. Mean Rank among Age Categories

			N	Mean Rank
<i>Factor 1</i>	Age	17-18	104	213.10
		19-20	200	165.60
		20 above	76	225.12
<i>Factor 2</i>	Age	17-18	104	159.86
		19-20	200	200.12
		20 above	76	207.12

		17-18	104	214.87
Factor 6	Age	19-20	200	167.31
		20 above	76	218.18

DISCUSSION AND CONCLUSION

The results show that by utilizing factor analysis six new factors are constructed and assigned as factors of usage of social media affecting youth. The new factors are named as 1) Influences on health 2) Learning through communication and skills 3) Facilitator for youth in business field 4) Wastage of time 5) Source of entertainment for youth interest 6) Increase in the level of awareness.

It is found that significant mean difference exists between genders on factor 2, factor 3 and factor 6. Male students use social media for learning through communication and enhance their skills and efficiencies as compare to female students. For male students, social media is facilitator in business field as compare to female students. Social media has enhanced female student's level of awareness compared to male students.

It is also observed that age influences on usage of social media. Significant mean difference exists among age categories on factor 1, factor 2 and factor 6. Social media plays important role in learning and enhancing abilities for youth especially for 20 above age group. Results also reveal that there are more health problems for age group 20 above due to excessive use of social media.

So, it is concluded that social media has various impacts on youth some are in favor of youth and some have negative impacts on youth. It connects people with each other. It provides learning, entertainment and job opportunities. It has enhanced the exposure of people and created awareness among youth in all respects. It also has bad impact as it is also a source of wastage of time, unethical activities and sharing useless information. It also causes health problems for youth. Users should take great care while using social media and must remember their social norms, cultural and religious values.

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