Adjustment Estimation and Validation of the Addiction to Social Networks Scale Using the SEM Methodology

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Abstract – Currently, social networks serve as communication tools, but the problem of excessive usage leading to addiction is on the rise. Therefore, the purpose of this study is to validate the Social Network addiction (SNA) scale in university students. The study is developed from a quantitative approach, of an exploratory and confirmatory type. The type of sampling is non-probabilistic by self-determination, and the participation of 200 students was achieved, to whom the reason for the survey was explained, who agreed to participate voluntarily. For data analysis, the instrument was validated according to Cronbach's alpha criteria and after, for the analysis, the SEM methodology was used. The most important findings show only the conformation of a two-factor model, which includes the seven most representative items, and which are feasible to analyze in this study group. The goodness-of-fit index (GFI) value is acceptable since it exceeds the theoretical threshold greater than 0.9 and the root mean square error of approximation (RMSEA) is less than 0.05.

The Tucker-Lewis index (TLI) and the norm adjustment index (NFI) are greater than 0.9. Based on the results, it can be concluded that students exhibit a strong desire for connectivity. Furthermore, they invest a significant amount of time in their online networks and experience uncertainty about how to occupy their when they are not connected.

Keywords – Social networks, addiction, college students.

1. Introduction

In the year 2023, internet users in the world have grown by 1.9%, reaching 5,160 million. In Mexico, the number of users has reached 96.87 million, which represents 80.8% of the total population [2]. Regarding the use of social platforms, [3] reports that, worldwide, users have increased by 10.1%, reaching 760 million people. The report also provides statistics on the time users spend on the networks and report that they spend online 2 hours and 31 minutes per day. Other important data shows that 53.7% of users of social networks are men, compared to 46.3% of women. The most used Social Networks (SN) are WhatsApp (95.60%), Facebook (84.90%) and Instagram (76.20%) YouTube is used by 60% of the users surveyed and those that have grown considerably are TikTok (44.20%) and LinkedIn (49.60%).

These data lead us to ask if, the excessive use of SN generates addiction. In this regard, some studies show that SN help improve communication opportunities, however, the excessive use of this technology increases its addiction. According to the studies [4], [5], SN addiction is understood under three aspects:

(i) Accessing social networking sites very often and dedicating extensive time to them, (ii) feeling a strong desire to use social networks, and (iii) as a consequence of not having time for social activities, social relationships, and school/work life.

In this sense, [5] carried out a study to develop a valid and reliable social networks addiction scale (SNA). The research was carried out on college students and its results show that the SNA scale is a valid and reliable measurement tool.

Nevertheless, what are SNA? For these purposes, a brief conceptualization of this term is pertinent. In this regard, [6] points out the characteristics of SN, which are the absence of physical contact between people and the absence of a relationship between the identities of the individual in the real world (offline). It is worth noting the key components of social networking addiction pointed to salience, mood changes, tolerance, withdrawal, symptoms, conflict and relapse, as fundamental characteristics of SN [7].

On the subject of SNA, some studies have reported interesting findings; such is the case of [8] who identified the existence of SNA in college students of the Kermanshah University of Medical Sciences. In their findings, they report that 36.4% of the students are not considered addicted, 53.9% about to become addicted, and 9.7% were addicted to SN. In contrast, the master's degree students, the rate of addiction to SN was 33%.

For their part, [9] carried out a study in which they surveyed 1000 students from the Shahid Beheshti University of Medical Sciences in Tehran, Iran. The finding indicates that only 44% (n=462) of all students are addicted to social networks, of which 90.4% (n=449) have a slight addiction, however, 9.96% (n=13) have a severe addiction to social networks.

In this idea, [10] reports the average score of addiction to SN, in Indonesian university students, according to their study the score was high, 16.79%. Similar is the case of the work of [11], who verified the prevalence of SN addiction among the Vietnamese population and the factors associated with SN addiction, in their findings they demonstrated that, in general, men obtained higher scores in SNA. Regarding the related factors that affect the scores are gender, locality, and marital status. Likewise, they explained that the most popular platforms among young people are Facebook, Zalo, and YouTube.

Given these arguments, it is clear that the SNA has been analysed in several studies, with significant results. This leads us to wonder if the scale can assess the level of addiction in a Latino context, considering that the context and the population as variables may be the ones that define the differences in this regard. Therefore, the objective of the study is focused on validating the SNA questionnaire proposed by [1], in university students of the Multidisciplinary Academic Unit Zona Media.

This questionnaire was chosen because it is built based on the criteria established by the American Psychiatric Association (APA); in addition, it has already been validated in a university population in Colombia [12].

2. Literature Review

Currently, SN play an elementary role in the environment of young people, technological progress favors the use of this tool in the area of communication, contributing to the exploration of information, sharing and expressing opinions [13], [14], [15], [16]. Social networks are considered a "global consumption phenomenon" [14]. In the educational field, the use of SN by students generates positive benefits if they use them in a reasoned manner; they also maintain good leadership and have an impact [13], [17]. Social networks are a priority and daily medium in education [15].

The daily life of young students revolves around the constant use of SNA, which are sometimes motivated to use them by the need to acquire information or to develop educational activities, the same situation that can lead them to pursue other objectives [15], [17]. Such as, for example, entertainment, including a wide range of web technologies as blogs, wikis, online social networks, and virtual networks [15]. In this idea, other recent studies have reported evidence of the level of SN addiction in university students [14], [18], [19], [20], [16]. These arguments give us support to think that the student populations are where this phenomenon occurs most frequently.

Other studies analyzed the time dedicated to the use of SN, in their findings; they report evidence in this regard. The study by [14] who analyzed the level of prevalence of addiction to SN with respect to the time spent to devices. The study was carried out on 114 young people, and the results showed the existence of gender differences in SNA. Male students have higher levels of SNA than female students do. In the same idea, [18] demonstrated similar behavior in students from India (70 women and 70 men), where it was found that men are more addicted to SN than women.

Different results in relation to the gender difference have been reported. A cross-sectional study was carried out in which 4868 students from Slovenia were surveyed [19]. In the study, they explored how psychological resilience affects SN symptoms, directly and indirectly through symptoms of depression, anxiety, and mental anguish. The result showed that women have a higher addiction to SN than men do.

In the work of [20], they examined the relationship between SNA, self-esteem, sensation seeking, and boredom. SNA was evaluated as a predictor of the other dependent variables. Their results show significant relationship between social media addiction and boredom and selfesteem. In addition, no significant relationship was found between SNA and sensation-seeking.

The regression analysis led to the conclusion that the surveyed students exhibit social networking addiction, with self-esteem and boredom identified as predictors of this addiction.

Contrary to the previous results, in the study developed by [16] they determined the relationship between the intrinsic reasons, the search, and the exchange of information for the variable addiction to SN. For this, they surveyed 321 Malaysian public sector students. Through a regression analysis between variables, they found that the majority of surveyed university students use SN for intrinsic reasons, but rarely use them for information search purposes. They concluded that the majority of the students surveyed are not addicted to SN.

SNA may also influence other variables as demonstrated in the study to measure the perceived risk of COVID-19 and the Internet addiction among Chinese college students during lockdown. A mediation model to assess the mediating role of emotion regulation difficulties between perceived risk of COVID-19 and Internet addiction in 690 university students during the pandemic in China was used. They found that there is an internal influence of the perceived risk of COVID-19 on the Internet addiction [21].

Other recent studies focused on measuring the relationship of the SNA variable with other variables such as: depression and stress; the intrinsic reasons and the search for information; boredom, self-esteem and sensation seeking, as well as educational performance. In relation to depression and stress, it was shown that they have a significant direct effect on SN addiction [19]. Other results showed that the intrinsic reasons and the addiction to SN have a significant relationship. However, there is no significant relationship between the search for information and SNA [16].

On the other hand, a significant relationship was demonstrated between addiction to social networks and boredom and self-esteem. However, no significant relationship was found between SNA and sensation seeking [20]. Similarly, it was reported that there is a positive relationship between SNA and educational performance [17]. Some factors that lead to SNA are inappropriate or excessive use [14], as well as spending several hours using and reviewing SN sites [22].

Therefore, some negative effects that SNA produces in university students are; behavioral disorder that captivates them and leads to worrying and negative consequences such as losing relationships, friendship, reducing physical and social commitment. Decreased self-esteem generates feelings of anxiety, depression, and damage to mental and physical activities; increases aggressiveness and violent behavior [18]. In addition, it causes exhaustion, which makes it difficult for students to continue their studies [17]. Bad socialization, addiction, psychological impact, vitiates time management, problems with ethics and health, violation of efficiency [22].

Finally, there are studies that show evidence that SN have a negative impact on academic performance [17], [23], [22], [18].

3. Design and Method

This work is of a non-experimental design and employs a deductive approach to explore the perceptions of university students regarding SNA. Therefore, it seeks to verify the factorial structure of a set of observed variables and verify the hypothesis that there is a relationship between the observed variables and their latent constructs. The study was carried out in the Middle Zone Multidisciplinary Academic Unit of the Universidad Autónoma de San Luis Potosí, located in the city of Rioverde S.L.P., Mexico. The Academic Unit offers seven bachelors programs of which four were selected: civil engineering, nursing, administration, accounting, and public finance. The total population of the seven bachelors programs is 1274 current students and enrolled in one of the different cycles and semesters of study at the time of carrying out the research. The sampling method used is non-probabilistic, based on self-determination, and it resulted in the voluntary participation of 200 students. The sample consisted of 42% men and 58% women. The instrument used was the Social Networks Addition (for its acronym Spanish ARS) test, proposed by [1], and made up of 24 Likert-type items integrated into three factors: a) Obsession with social networks (10 items), which focus on the constant thought of social networks and their negative effect when there is no access to them. b) Lack of personal control in the use of social networks (6 items), which refer to concern about the lack of control over the use of social networks and the neglect of academic commitments. c) Excessive use of social networks (8 items), referring to the difficulties in managing the frequency and duration of the use of social networks. The questionnaire was applied face to face. AMOS v23 software for data analysis was used.

4. Data Analysis

The data analysis results are presented as follows: Table 1 displays the findings related to the respondents' profiles.

Table 1. Student profil

Gender	%	Media	%	Activity	%
Male	42.0	Cellular phone	97.5	Study	55.0
Female	58.0	Computer	2.5	Study and work	44.5
Total	100.0			Only work	0.5
Semester	**%**	**Bachelor**	**%**	**Frequency**	**%**
First	16.5	Civil Engineering	38.5	All time	20,5
Third	0.5	Nursing	24.5	1 to 2 times per day	24,0
Fifth	12.5	Accountants	11.0	3 to 6 times per day	26,5
Seventh	48.0	Administration	26.0	7 to 12 times per day	28,0
Nineth	22.5			2 or 3 times/Semester	1,0

4.1. Confirmatory Analysis

The scale proposed by [1] was applied to university students and the database was evaluated using confirmatory factor analysis (CFA). The result yields two factors, which only include 7 items; four in one factor and three in another, which explain the addiction to social networks in the population studied. Table 2 shows the fit indices of the model and Graph 1 shows the structural model obtained with the SEM methodology.

Table 2. Model fit indices

Absolute fit measurements		Incremental adjustment model		Parsimony Adjustment Measures	
CMIN	17.873	TLI	.978	CFI	.986
df	13	NFI	.952	PNFI	.600
p	.162			CMIN /DF	1.375
RMSEA	.043				

The three fit measures: absolute fit, incremental fit, and parsimony, are statistically significant and align with the suggested theoretical criteria. The goodness of fit index value (GFI) is acceptable (> 0.9) and the root mean squared error of approximation (RMSEA) is less than 0.05 [24]. In the incremental fit measures, the Tucker-Lewis Index (TLI) and the Normed Fit Index (NFI) are greater than 0.9 [24].

With respect to the adjustment measures of parsimony, the parsimony standardized adjustment index (PNFI) relates the constructs with the theory that supports them.

Values close to 1.0 are higher than their relationship, the value obtained is acceptable (0.600), and in addition, the value of chi-square normed is within the recommended limits (lower limit less than 1 upper limit 3.0).

After accepting the model, each construct is evaluated by examining the weights of the statistical significance indicators and evaluating the reliability of the construct and the extracted variance. Regarding reliability, both constructs are greater than 0.7. The extracted variance values are within the allowed limit (0.5), indicating that more than half of the variance of the specified indicators are taken into account for the construct.

Table 3. Reliability values and extracted variance

Construct	Reliability	Extracted variance	Extracted variance root
F1	**0.7203**	0.49	0.626
F2	0.7229	0.50	(

Source: own.

Graph 1 shows the model obtained from the analysis performed on the 24 items. The result is an adjusted model of two constructs, represented as F3 and F4.

Factor 3 is made up of 4 items, related to the longer time the student needs to attend to their social networks (X2), they do not know what to do when they are offline (X5), they feel a great need to be connected (X1), Finally, the student feels relieved and relaxes when entering the social networks (X8). The F4 factor is made up of three items that correspond to: the time the student spends on social networks (X16), staying connected for a long time (X17), and the time he is not connected when in class (X23).
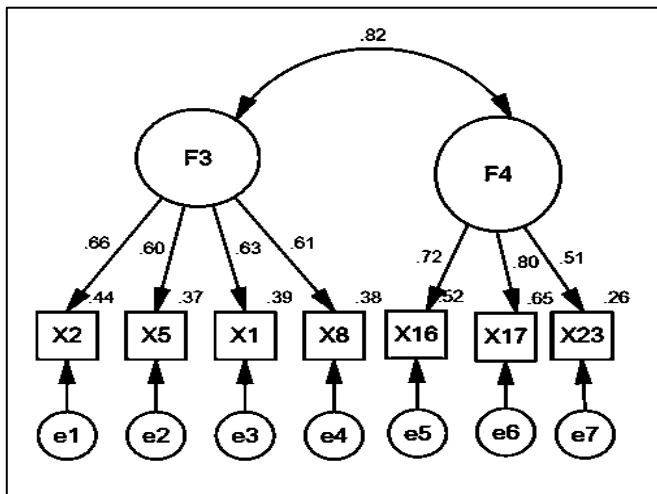
Graph 1. Addiction model to social networks

X1: I feel the need to stay connected to social networks.	X16: I spend a lot of time during the day using social networks
X2: I need more and more time to attend my issues related to social networks.	X17: I spend a lot of time connected to social networks.
X5: I do not know what to do when I get disconnected from my social networks	X23: When I am in class without connecting to social networks, I feel bored.
X8: Using social networks gives me relief and relaxes me.	

Source: Own elaboration with items from the [1]

5. Conclusion

The results of the study reveal that the SNA test, applied to university students from the media zone multidisciplinary academic unit, can measure only two of the three factors proposed by the authors. The items of each factor are distributed in a different way to what the authors propose.

The students of the academic unit need more and more time to spend on social networks, they do not know what to do if they are not connected and when they do they feel relief and relaxation (Factor 1 considered as obsession). In addition, they spend a long time on social networks and not being on these platforms, annoy them (Factor 2, excessive use).

Based on the above findings, we can conclude the following:

a) According to the measurement model proposed by the authors previously in the study, it is recommended to apply it in other universities in Mexico, to verify if the three factors are validated in other contexts, or in case, present variations such as found in this work.

b) The study identified two factors that can measure addiction to social networks in university students: obsession and excessive use are two traits of university students from UAZM-Zona Media. The model can strengthen the measurement of addiction to social networks as implied in the study.

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