Contents lists available at ScienceDirect

Telematics and Informatics

journal homepage: www.elsevier.com/locate/tele

School performance, social networking effects, and learning of school children: Evidence of reciprocal relationships in Abu Dhabi

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ARTICLE INFO

ABSTRACT

This study uses structural equations modeling to test a hypothetical social network model with applications to a sample of 34,896 school children in Abu Dhabi. The main independent constructs in the model are related to children's attitude with regard to social networking, reasons for using social networks, things done on social networks, and topics used. The dependent constructs cover perceived school performance and social effects of social networking. The study will describe the relations among the various constructs. The effect of other variables, such as parental knowhow, is also investigated. Our work has improved our insight in the social networking model. Results support the idea of reciprocal relations among perceived performance, learning from social networking, and the effect of social networking. Evidence for a model that includes opposite pathways implies that the problem of social networking constructs, its antecedents, and possible consequences should be examined with caution.

1. Introduction

In today's world, children can access the Internet and social media applications from many different entry points, including iPads, tablets, desktops, laptops, and smartphones. Deng and Tavares (2013) noted that social networking has become an integral part of our children's social life; it is now seen as a learning platform that could be utilized to enhance student engagement and performance. Social networking and media tools offer school children the opportunity to communicate, get in touch, access information, research, and chat (Abdulahi et al., 2014; Ahn, 2011).

Beginning early in development, children learn from watching others and through social interaction. Some socio-cultural theories suggest that children learn in the context of their social and cultural environment (Greenfield, 2009). Some suggest that because media are in children's learning environments from early on, they are an important influence on burgeoning social cognition beginning at a very young age and continuing through adolescence and beyond (Greenfield, 2009; Rideout et al., 2010). Moreover, media connects to salient and important developmental tasks in adolescence, such as social learning and identity formation (Subrahmanyam and Smahel, 2010). Rios-Aguilar et al. (2012) noted that "social media is redefining how individuals create ties with other individuals as well as how individuals establish relationships with the

organizations that serve them." They also stress that social networking sites play a key role in peoples' lives because they provide a space for people to communicate with friends and peers or share information, and through websites and services that encourage and facilitate participation, social media allows a person to collaborate and build communities.

In March 2016, Clouds-Media, 2016 reported that 95% of UAE's population has direct access to the Internet, and the UAE is one of the largest consumers of social media in the world, with more than 50% of the population active on social media. The report added that Facebook, Twitter, and Instagram are the most popular social media platforms, and Snapchat is also witnessing a massive rise in popularity, especially with younger audiences. However, studies concerning UAE school children's use of social networking are rare. Badri et al., 2016 examined the usage of social media devices and applications among students in Abu Dhabi. A survey of more than 31,000 children from private and public schools showed a high home access to the Internet of 91.7%. Results showed that children used social media mainly for keeping contact with friends and family and for learning purposes. A report by Al Sayigh (2013) noted that "The new communication revolution has effected a major change in the culture and lifestyle of people, particularly of the youth. Many of the prevailing problems afflicting the youth – such as introversion, social isolation, Internet addiction, poor performance at schools, and the acquisition of bad habits and values, such as violence and criminal behavior – are a direct consequence of the big change that has struck our social culture." The report added that "sophisticated devices, such as 'iPad,' pose a new challenge to Emirati families as they remain in the hands of children and are a matter of concern for many parents. Some complain that iPad has stolen their kids from them as these devices divert them from their daily studies, completing their homework, and even from communicating with the rest of the family."

The findings of this study will add to the current body of research, furthering the long line of research that has been conducted on the effects of social networking or social media on school-aged children. This study examines the structural relations between the major determinants of social networking. The model of social networking presented incorporates independent constructs related to children's attitude with regard to social networking, reasons for using social networking, things done on social networking, and topics used. The dependent constructs cover perceived school performance and social effects of social networking. The study will also explore the influence of other variables such as student's gender and grade level and school type. The effect of other variables, such as parental knowhow, is also investigated.

2. Literature review

The research on social networking and children usually focuses on many aspects or dimensions. Most empirical studies dealt with the relations between using social networking and academic performance (Alwagait et al., 2015; Hawi and Samaha, 2016). Some studies attempted to shed light on the learning aspects of using social networking (Zhang et al., 2015; Mao, 2014). Many studies focused on the negative things that could occur in children using social networking (Maddena et al., 2016; Koutamanis et al., 2015; Li, 2017). Some studies attempted to focus on the reasons why children use social networking (Samaha and Hawi, 2017), while others studied the children's attitudes toward social networking related to being connected (Miller et al., 2015; Tomczyk and Kopecky, 2016). Some studies touched on the sensitive role of the involvement of parents in their children's use of social networking (Lovea et al., 2016).

Empirical studies showed mixed results with regard to the impact of social networks on academic performance. Studies have found that the participation of students on social networks may have both positive and negative impacts on their academic performance. Mehmood and Taswir, 2013 noted that "the use of social media networks and the Internet is one of the most important factors that can influence educational performance of students positively or adversely."

Several studies in different cultures and countries on the use of social networking and academic performance found no significant relations. In Ethiopia, Ndaku et al. (2013) found no significant relation between time spent on social networks and students' grade point average. In a study in Pakistan, Ahmed and Qazi (2011) also noted that there was no significant relation between time spent on social media networks and students' academic performance. In Nigeria, Akanbi and Akanbi (2014) found no evidence of a correlation between social media usage and academic performance. Meanwhile, through studies in the United States, Paul and Gelish (2011) and Kolek and Saunders (2008) found that the use of social networks was not related to academic performance.

A number of researchers have found a negative impact that social network participation has on students' academic performance. Malaney (2005) found that some students in multiple studies in 2000 and 2003 reported that their grades had suffered as a result of too much time spent on social media. Banquil et al., 2009 found evidence of a continuing drop of grades among students because of using social networking. Some studies reported a significant negative relation between Facebook use and academic performance (Gafni and Deri, 2012; Junco, 2012a,b, 2011; Ndaku, 2013; Rouis et al., 2011). Banquil et al. (2009) observed a drop in students' grades and lack of time as consequences of social networking participation. Other studies also concluded that the obsession with SN had adverse effects of social networking on student performance (Paul et al., 2012; Burak, 2012). Results of a study of Swedish students indicated that the extensive use of social networking and Facebook by students will lead to poor academic performance (Rouis et al., 2011). Nevertheless, a number of researchers and studies have found a positive impact that social network participation has on students' academic performance. Some studies focused on Facebook usage and its positive impact on academic performance (Junco, 2012a; Tuan, 2013). Many studies found positive impacts of social media and networking on language and reading (Tuan, 2013; Wood et al., 2014).

Social networking and media can provide rich tools for teaching innovation and compiling ways to engage students effectively (APA, 2011). Results of some empirical studies show that educators should embrace social media (Ito et al., 2009).

Some suggested that high school students use it to connect with other students for homework and group projects (Boyd, 2008). Some teachers use blogs as teaching tools, where they reinforce skills in English, written expression, and creativity (Borja, 2005). Social media also allow students to get together outside the class to collaborate and exchange ideas about projects and assignments O'Keeffe and Clarke-Pearson, 2011.

Gafni and Deri (2012) used the term "social absorption" for students, where they emphasized the role of social networks in socializing and opening new channels for discovering more academic resources. Ahmed and Qazi (2011) found that social network sites promote interactions among students and teachers. Rouis (2012) performed a study on 161 Tunisian students and concluded that academic performance was improved because of their satisfaction with their family and friends' relations and consecutiveness.

With regard to uses and activities of children on social networking, Ito et al., 2009 identified a number of positive activities that children undertake. The technologies involve several positive activities mostly related to involvement in interest-driven communities. Ahn (2011) added that "Social network sites provide a platform for the youth to participate in communities that help them to learn and practice skills within a particular knowledge area." Similarly, a study by Fishman et al., 2005 indicated that "college students produce tremendous volume of writing through various social media tools such as blogs, emails, and other social media environments."

In terms of educational benefits, a number of researchers have found positive outcomes in online community engagement among children and their peers. Tiene (2000) showed that "written communication on cyberspace enables students to take part in discussions at a time convenient to them and articulate their ideas in more carefully thought-out and structured ways." Deng and Tavares (2013) concluded that "web-based discussions can contribute to the development of students' reflective ability and critical thinking skills." The authors also add that relative to face-to-face communication, "children are more willing to voice their views (agreements or disagreements) and are more attuned to others' opinions in online discussions." According to Apeanti and Danso (2014), students think that it is more fun for their teachers to use social media. The authors also note that children think their academic performance would be better if they could contact their colleagues and teachers through social media. The authors noted also that teachers should offer class hours on social media. Researchers have tackled different methods and ways where social networking could be utilized in education. These methods included gaining more vocabulary and writing skills (Yunus et al., 2013), exchanging assignments, discussions, and resources with fellow students (Asad et al., 2012), formulating group discussions, communicating, and exchanging ideas with fellow students (Salvation and Adzharuddin, 2014). Other benefits involve teachers being able to share course related materials with their students, create student groups, collaborate on projects, providing peer support and facilitating teaching (English and Duncan-Howell, 2008).

Paul and Gelish (2011) noted that students' social network use is related to their personality and, hence, attitude toward social networking. They elaborated that "some students are influenced more than others depending on their personality." Burak (2012) addressed the issue of risk-taking behavior when using social networking. The study concluded that multitasking would lead to "higher risk-taking behavior." Fowler and Nicholas (2008) reported that clusters of happy and unhappy people were visible in the social network as well as separation of friends. Tartari (2015) showed that social media had a positive effect on children and teenagers. A positive impact was noticed with regard to communication abilities, information research, technical skills development, and effective use of new technology. Results also showed negative effects of risk, depression, cyberbullying, and sexual harassment. Ito et al., 2009 reported that social media may influence aspects such as romance, friendship, social status, and sharing music, movies, video games, and other aspects of adolescent culture. Boyd (2007) suggested that social media enhances children's view of self, community, and the world. Staying connected by social media helps children to stay connected with friends and family and to make new friends, share pictures and videos, and exchange new ideas (O'Keeffe and Clarke-Pearson, 2011).

In their study, Akanbi and Akanbi (2014) found a significant difference between males and females in social media usage. Studies by Brenner (2012) and Rideout et al., 2010 indicate that girls on average spend more time on social media sites than boys do. The same studies also indicate that more girls use Facebook and Twitter. Other studies note that more boys use music-sharing sites (HuffPost Women, 2012; Williams, 2012). A study by Gross (2004) reported that both genders were embracing the Internet as a means of communicating with their friends. The author indicates that chatting via instant messaging is the most common activity among American high school students. Lenhart and Madden (2007a,b) noted that teenage girls in the U.S. were more active bloggers than boys, but boys were more likely to upload online videos. Boys spend more time playing video games and visiting video websites (Rideout et al., 2010), while girls share more videos (Lenhart, 2012; Lenhart et al., 2010). Most reasons cited by young children in the U.S. for visiting social media sites are to connect and communicate with others (Urista et al., 2009). Girls generally use social media to communicate with friends, while boys more often use social media to make new friends (Barker, 2009; Lenhart and Madden, 2007a).

Girls usually post "cute" pictures while boys were more likely to share "self-promoting" pictures and comments (Peluchette and Karl, 2008). Girls in both the U.S. and Sweden are more likely to post photographs of themselves with friends (Lenhart and Madden, 2007b). Boys are more likely to orient toward technology, sports, and humor in the information they post to their profile (Sveningsson, 2007). Boys are more likely to share their location and/or phone number (Lenhart and Madden, 2007b; Pujazon-Zazik et al., 2012). Many studies found that girls place more emphasis on selecting pictures in which they are attractive (Siibak, 2009; Kapidzic and Herring, 2011). Studies in general reported that girls are more likely to restrict access to their profiles (Patchin and Hinduja, 2010; Thelwall, 2008). Some reported that girls are more likely to restrict their profile visibility to their friends only (Lenhart et al., 2010).

A study by Ybarra and Mitchell (2008) and Muscanell and Guadagno (2012) indicated that girls are significantly more likely to have experienced sexual solicitation. Studies have shown that a majority of American teens viewed sexually explicit websites (Siibak, 2010; Brown and L'Engle, 2009). When it comes to privacy, studies have indicated that in general, both boys and girls often controlled their audience to be limited to their friends but not usually their parents or teachers (Qian and Scott, 2007; Kiss, 2013; Peluchette and Karl, 2008). Carmon (2010) found that boys pretended to be more macho, whereas girls pretended they were older and with higher self-esteem.

3. Methods

3.1. Sample and survey

An appropriate survey instrument was designed to capture several principle constructs. The constructs (or dimensions) included perception of school performance, reasons to use social networking, student's attitude toward social networking, things done on social networking, the effects of social networking, and the negative aspects of social networking. To design the survey instrument, several sources were examined and used. These included Department of Media and Communications LSE, 2010-EU Kids Online II Questionnaire, the Ofcom (2014) Young People's Media Usage Survey, and the Australian Communications and Media Authority (2012) survey of children and young people's use of social networking sites.

For "perception of school performance," students were asked to rate their academic performance (according to their school report card) for the last academic year. The five choices were "unsatisfactory," "needs improvement," "achieves standards," "exceeds standards," and "excellent." For "important reasons for using social networking," students were asked to provide a score for the extent to which they consider the listed reasons important for their use of online social networking applications. On a five-point scale, the scores ranged from "not important" to "very important." To measure "student's attitude for using social networking-communication or learning purposes," a five-scale measure was provided. The measures ranged from "strongly agree" to "strongly disagree." For "things done on social networking," students were asked to score each listed option as to how often they have done each of the listed things when using online social networking applications in the last 12 months. A five-point Likert scale, from "never" to "always," was provided. For "topics discussed," students were asked how often they were seen on social networking where people discuss the listed topics in the past 12 months. The five-point scale ranged from "never" to "always."

A letter was sent to every school in Abu Dhabi asking students to participate in the online survey through a posted link. The survey was online for two weeks in May 2016. A total of 32,376 students replied to the survey. Approximately 30% of the students came from public schools, while most came from private schools in Abu Dhabi. Approximately 59.3% of students came from Abu Dhabi, 35.3% from Al Ain, and 5.4% from Gharbia. Students of almost all school ages (school grade 3 and above) responded. The highest percentages were attributed to age 10 (3.4%), age 11 (13.6%), age 12 (18.3%), age 13 (18.1%), age 14 (16.5%), age 15 (12.7%), age 16 (9.4%), and age 18 (1.5%). School girls accounted for 59% of respondents, while male students constituted 41% only.

3.2. The measurement constructs

In practice, the variables of interest are often latent (unobservable) variables, such as, in this study, attitude toward social networking, reason for using social networking, negative topics in social networking, effects of social networking, perceived school performance, and things done in social networking. Before designing a structural model, it is necessary for each of these latent variables to be modeled by specifying a measurement model first. The measurement model specifies the relations between the observed indicators and the latent variables while the structural equation model specifies the relations among the latent variables.

Exploratory factor analysis (EFA) is a common method for evaluating unidimensionality of each of the constructs (final measurement models of each construct) (Jöreskog and Sörbom, 2006). Unidimensionality implies that a set of items forming an instrument measures one thing in common. Unidimensionality is an important aspect of construct validity. The assumptions of unidimensionality are of importance in most measurement models/theories. In this regard, the Robust Maximum Likelihood method of LISREL 9.2 is used to fit and refine a measurement model to the scores of a sample of school children on specified variables.

After collecting 1000 responses, each construct in the survey was tested using confirmatory factor analysis (CFA). Table 1 shows the statistical fit results of the measurement models using CFA in LISREL. To achieve best-fit stats, the number of items in each construct was reduced. Two of the constructs were reduced to three items only. As shown in the table, all reduction yielded good statistical fits for all of the seven constructs. The statistic-fit scores show good measurement models. All RMSEA results are less than the threshold of 0.05, with acceptable scores for other estimates of NFI, NNFI, CFI, RFI, GFI, and RMR and with the value of all (χ^2/DF) being less than 3.0 (Schumacker and Lomax, 2004; McDonald and Ho, 2002).

Table 2 shows the results with regard to the arithmetic means, Cronbach alpha, standardized estimates, and the resulting *t*-values. Cronbach alpha reliabilities ranged from 0.12 to 0.861. The resulting variables enjoyed high and significant *t*-values. The variables with low standardized estimates dropped out from further analysis. Some constructs enjoyed high means of its related variables (i.e., perception of school performance, attitude toward social networking, and perception/knowledge

Table 1
Statistical fit results of the measurement models (CFA).

	Initial number items	Final number items	χ^2	DF	RMSEA	p-value	NFI	NNFI	CFI	RFI	RMR	GFI
Perception of school performance	6	4	2.11	1	0.0153	0.00253	0.999	0.998	0.999	0.998	0.00313	0.999
Negative things happened (as results on SN)	9	4	0.55	1	0.0010	0.45656	0.999	0.999	0.999	0.999	0.00028	0.999
Things done on SN	6	5	4.75	2	0.0060	0.09288	0.999	0.999	0.999	0.999	0.00122	0.999
Important reasons for using SN (Why?)	8	5	2.79	3	0.0001	0.42459	0.999	0.999	0.999	0.999	0.00286	0.999
Attitude of SN (communication/connected)	5	3	–	–	–	–	–	–	–	–	–	–
Perception/knowledge from SN (learning)	6	3	–	–	–	–	–	–	–	–	–	–
Topics - Effect (outcome) of using SN	8	5	0.10	2	0.0001	0.95360	0.999	0.999	0.999	0.999	0.00216	0.999

Table 2
Resulting constructs and variables after CFA and Reliabilities.

Constructs and variables	Mean	S. Estimate	*t*-value
Perception of school performance (Cronbach Alpha = 0.752)			
Performance in English	3.88	0.60	89.87
Performance in Mathematics	3.86	0.66	112.85
Performance in Science	3.99	0.79	127.66
Performance in Social Sciences	4.25	0.60	103.75
Negative things happened (as results on SN) (Cronbach Alpha = 0.806)			
Spent less time than I should doing school work	2.18	0.69	134.78
Tried unsuccessfully to limit time spent on SN	2.22	0.82	163.92
Ended my friendship with someone	1.66	0.82	163.38
Caused a problem with my parents	1.70	0.80	155.98
Things done on SN (Cronbach Alpha = 0.848)			
Shared personal information to the public	1.89	0.66	123.52
Sent personal information to people I do not know	1.60	0.86	184.96
Sent photo or video of myself to someone never met	1.54	0.86	184.50
Added people I never met to my friend's list	2.05	0.64	126.19
Pretended to be different kind of person than what I am	1.70	0.63	123,48
Important reasons for using SN (Cronbach Alpha = 0.744)			
To make new friends	2.70	0.50	76.16
To keep in touch with family and friends	4.07	0.36	53.92
To share photo/music/video	3.03	0.60	85.16
To play games	2.92	0.48	67.10
To be like others (most friends use it)	3.23	0.48	93.14
Attitude of SN (communication/connected) (Cronbach Alpha = 0.712)			
Keeps me feeling connected	3.90	0.62	100.08
Has become integrated part of my life	3.50	0.80	99.09
Easier to communicate on SN than face-to-face	3.29	0.69	108.25
Perception/knowledge from SN (learning) (Cronbach Alpha = 0.719)			
Using SN for learning	3.86	0.64	113.43
Using SN made me aware of diversity of people, cultures and opinions	3.82	0.76	131.20
SN increased my understanding of current issues and news	3.62	0.59	87.47
Topics - Effect (outcome) of using SN (Cronbach Alpha = 0.861)			
Ways to physically harm or hurt self	1.74	0.66	123.26
Ways of committing suicide	1.63	0.81	159.28
Ways to be thin	2.31	0.81	165.56
Ways to find and take illegal drugs	1.47	0.73	141.06
Talk about drinking alcohol	1.55	0.63	122.28

gained from social networking). Two constructs recorded lowest variable means (things done on social networking and effects of using social networking).

Each of the model's seven constructs was represented by a single variable (summed scores of all the items in the same construct). The multivariate normality assumption will be tested univariately through examining the skewness and kurtosis of each univariate variable (McDonald and Ho, 2002). Several studies, as reported by McDonald and Ho (2002), indicated that unless extreme values of skewness and kurtosis are detected, the use of the Maximum Likelihood estimation generates robustness in the case of multivariate nonnormality and, hence, the parameter estimates maintain their validity. Data analysis in this study excluded survey items with extreme values (outside the range of +2 and −2) of skewness and kurtosis.

To investigate the unidimensionality of item response data, which is an essential component of construct validity, EFA could indicate whether we have a unidimensional or multidimensional scale (Jöreskog and Sörbom, 2006). This analysis helps to discover the number of dimensions or scales that exist in a group of variables. In addition, EFA helps reduce data by grouping variables into sets that tap the same phenomena. EFA results show that all analyzed constructs yielded a single factor, except for the construct related to "attitude toward social networking," which yielded two factors. As a result, the attitude construct was split into two constructs: attitude (connected) and attitude (learning).

4. Analysis

To determine the extent to which the proposed model was supported by the collected sample data of Abu Dhabi school students, structural equation modeling (SEM) was used to test the fit of each of the proposed models. In particular, SEM was used to test the fit of the covariance matrix against the relations being posited in this study (Table 3). Covariance is a measure of the extent to which corresponding elements from two sets of ordered data move in the same direction. In simple terms, if a number at a certain position in the covariance matrix is large, then the variable that corresponds to that row and the variable that corresponds to that column change with one another. When one goes up, the other goes up. When one goes down, the other goes down. If a number at a certain position in the covariance matrix is close to zero, then the variable that corresponds to that row and the variable that corresponds to that column do not change with one another. When one goes up, the other does not change significantly. Usually, the structural equation model implies a structure for the covariances between the observed variables. Usually, the structural equation model is supported if its implied covariance matrix does not differ significantly from the empirical covariance matrix.

SEM is a collection of statistical techniques based on the general linear model, which allows a researcher to test how sets of variables define constructs and how these constructs are related to each other (Schumacker and Lomax, 2004). Several steps were implemented for the SEM: model specification, model identification, model estimation, model testing, and model modification. This study followed the SEM procedures recommended by Schumacker and Lomax (2004). LISREL was used for computation in SEM.

Three models will be presented in this study. The first model (the simple model) is depicted in Fig. 1. The model proposes the least number of paths from five different constructs (independent constructs: attitude toward social networking, attitude toward learning, reasons for using social networking, topics of social networking, and things done on social networking) to two other constructs (dependent constructs: school performance and effect of using social networking). Most of the proposed relations are captured in other empirical studies that used structural equation models or simple correlation related analysis (Rosen et al., 2014; Koutamanis et al., 2015; Al-rahmi1 et al., 2014; Abdulahi et al., 2014; Ziv et al., 2016; Buglass et al., 2016). The second model expands the relations to include modification suggestions provided by LISREL. To investigate the reciprocal hypotheses, the third model reverses the path directions from other constructs to school performance to see if reversing the directions would yield a good model. In all three models, all path direction possibilities will also be considered.

To investigate gender differences, MANOVA will be conducted across the variables comprising each of the constructs in the study. MANOVA is used to determine whether there are any differences between independent groups on more than one continuous dependent variable. It should be added that MANOVA can detect differences too small to be detected through individual ANOVAs. MANOVA can also capture multivariate patterns, if present (see Huberty & Olejnik, 2006).

5. Results

The first model (simple model) is shown in Fig. 1. Four independent constructs are shown that are related to social networking (connection attitude, why use, topics, and things done). Three dependent constructs are shown (school

Table 3
The covariance matrix.

|	Performance	Why use of SN	Attitude (connected)	Perception (learning)	Things done on SN	Negative actions	Effect of SN
Perception of school performance	0.839						
Important reasons for using SN (Why?)	0.048	0.551					
Attitude of SN (communication/connected)	0.028	0.257	0.616				
Perception/knowledge from SN (learning)	0.048	0.180	0.347	0.578			
Things done on SN	−0.007	0.132	0.126	0.041	0.574		
Negative things happened (as results on SN)	−0.014	0.078	0.078	0.030	0.336	0.618	
Topics - Effect (outcome) of using SN	−0.045	0.117	0.181	0.078	0.299	0.322	0.663
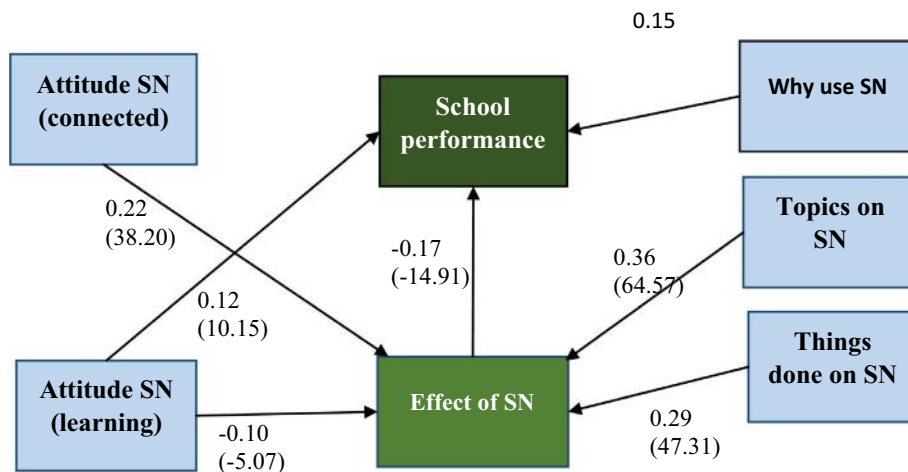
Fig. 1. The simple SEM relations and parameters (standardized estimates and *t*-values).

Table 4
Structural equation model(s) fit statistics.

Model	χ^2	DF	RMSEA	p-value	NFI	NNFI	CFI	RFI	RMR	GFI	AGFI	χ^2 / DF
Model (simple)	9.800	4	0.00645	0.04387	0.999	0.998	0.999	0.998	0.00135	0.999	0.998	2.4500
Model (expanded)	5.737	3	0.00553	0.12278	0.999	0.998	0.999	0.998	0.000821	0.999	0.998	1.9123
Model (reciprocal)	4.340	2	0.00953	0.01550	0.999	0.998	0.999	0.998	0.00082	0.999	0.998	2.1700

performance, learning attitude, and effects). The model fit statistics are very good (Table 4) with an RMSEA of 0.00645, P-value of 0.04387, and (χ^2/DF) of 2.45. The highest standardized estimate parameter (0.56) is student attitude related to being connected on attitude toward learning from using social networking. Perception of school performance is influenced by the reasons for using social networking (0.13), effects of social networking (−0.16), and learning attitude from using social networking (0.11). The negative estimate of effect of using social networking reflects that if negative things are encountered by students (physically hurt, finding illegal drugs, committing suicide), then performance is negatively affected. In contrast, the attitude toward learning as a result of using social networking has a positive effect on perception of school performance. Interestingly, the effect of using social networking is significantly influenced by four other constructs with the highest effect coming from topics explored by using social networking (standardized estimate of 0.37). The model also reveals the presence of some mediation constructs. We note that the construct related to the effects of using social networking is acting as a mediator between two different sets of effects. First, it is acting as a mediator between topics on social networking (0.36), things done on social networking (0.29), and school performance (−0.17). Second, it is also acting as a mediator between attitude to being connected (0.22), learning (−0.10), and school performance (−0.17).

The second model incorporates all modification recommendations suggested by LISREL (Fig. 2). There is a slight improvement for this model with RMSEA of (0.00553), P-value of 0.12278, and (χ^2/DF) of 1.9123. This model witnesses three additional paths. The most significant is the effect from attitude for being connected to attitude toward learning (0.56). A significant path with a negative sign is also added from topics on social networking to learning attitude toward social networking (−0.08). This model also reflects the presence of two mediating constructs leading to school performance: attitude toward using social media for learning purposes and effect of using social networking.

As we argue that there might be a reciprocal, dynamic relation between perceived school performance and effect of social networking or learning from social networking, it was necessary to test such hypotheses. The hypotheses reflect the assumption that perceived school performance is an integral part of experiencing learning or effect of social networking among school children. The third model (Fig. 3) tests three paths coming out from perceived school performance to reasons for using social networking, attitude to learning from social networking, and effect of social networking. The model results in an RMSEA of 0.00953, P-value of 0.01550, and (χ^2/DF) of 2.1700. According to these indicators, this is a good one too. The analysis yields evidence of a reciprocal relation between perceived school performance on effect of social networking (significant estimate of 0.21), on reasons for using social networking (significant estimate of 0.11), and on attitude to social networking learning (significant estimate of 0.15). We should mention that this model shows also the influence of five constructs on the dependent construct of effect of social networking with significant high standardized estimates from things done (0.39), topics on (0.36), being connected attitude (0.34), attitude on learning (0.25), and perceived school performance (0.21).
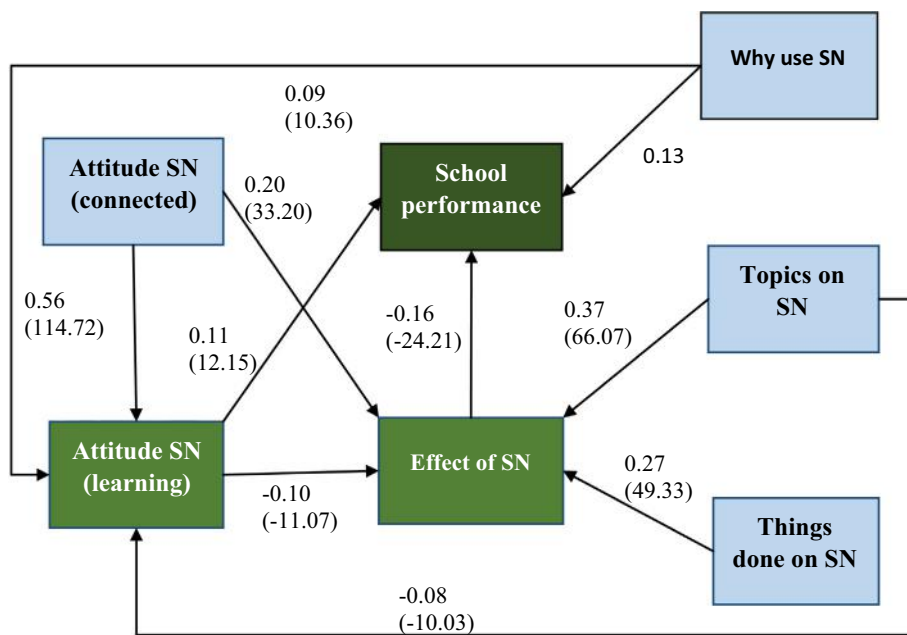
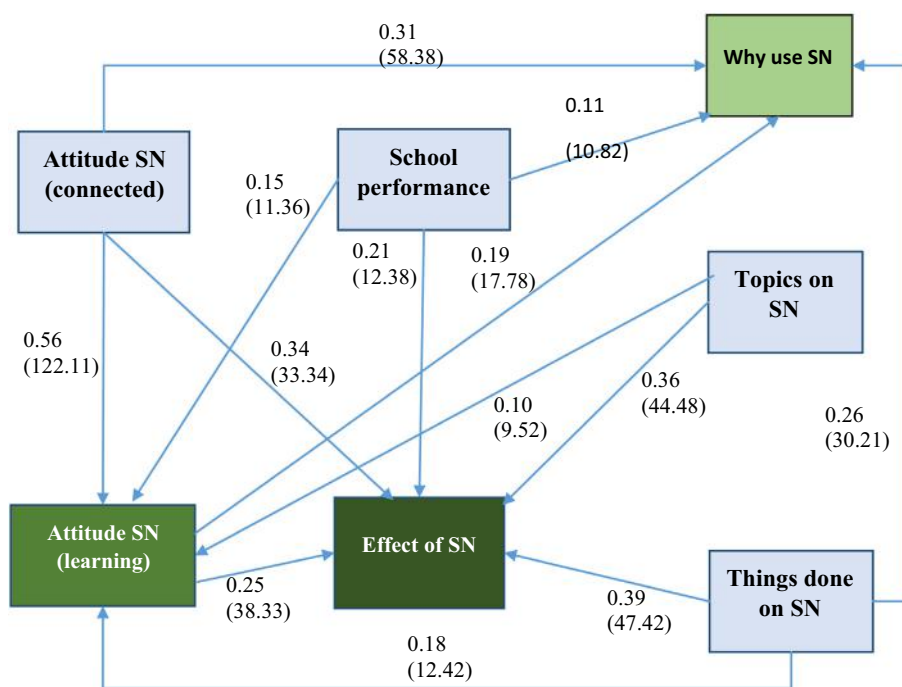**Fig. 2.** The expanded SEM relations and parameters (standardized estimates and *t*-values).

Fig. 3. The reciprocal-effect SEM relations and parameters.

6. Discussions

There are many advantages of using the SEM framework. The analysis of the three models presented reveals the presence of some mediation effects. The models contain constructs related to social networking. The constructs are related to student attitude toward being connected, attitude toward seeking learning prospects, reasons for using social networking, the effects of social networking, the topics covered, things done, and perceived school performance. The structural equation models

allow for ease of interpretation and estimation of relations, as well as the directions of those relations. The framework also simplified testing of mediation hypotheses that might be present.

This research-based study provides ample evidence on the advantages and usefulness of social media implementations for school students learning purposes. The results are consistent with other studies of such related attitude to learning (Hew, 2011; Junco et al., 2012).

The study has revealed that participation in social media has many benefits for school children. Despite the benefits, it could negatively impact their academic performance if not used properly. Several benefits exist in the use of social media networks when it comes to learning. Despite the various benefits that come with the involvement of school students on social media networks, the results indicate that its misuse could negatively affect the academic performance of the students.

The study has revealed the direct impact of the participation of students on social media networks on several fronts. Social media outcomes negatively influenced school performance if not used properly. This result is consistent with other empirical studies conducted in other cultures (Yeboah and Ewur, 2014; Salvation and Adzharuddin, 2014; Rouis et al., 2011; Rouis, 2012). The findings reflect the significant role of social media in the lives of young school students.

An important outcome of this research is the reciprocal effect of student performance on the effects of social media. Simply put, good students have an influence on how social media might affect them. It seems that as the self-perceived perception of students improves, their perception of the negative effects of social media improves too (i.e., their health, behavior, etc.). It seems that "better" students might engage in more "learning" aspects of social media as well. In the third model (Fig. 3), we could clearly see that school performance affects three most important aspects related to social media (reasons for using social media, attitude toward social media (learning), and effect of social media).

Each of the three models presented in this study suggests unique outcomes that are worth examining. The first model (Fig. 1) presents four fully independent latent constructs (reasons for using social media, topics on social media, things done on social media, attitude (connected), and attitude (learning)). The latent variable (school performance) acts as a completely dependent latent construct, while the construct related to effect of social media exerts influence and received influence from other latent constructs. The second model (Fig. 2) also presents four fully independent latent constructs (reasons for using social media, topics on social media, things done on social media, and attitude (connected)). Again, the latent variable related to school performance acts as the only latent construct that is completely dependent on other latent constructs. The two constructs related to effect of social media and attitude (learning) exert influence to and receive influence from other latent constructs. In the third model (Fig. 3), the construct related to effect of social media became the sole dependent latent variable. Various direct effects are observed in five other latent constructs (topics on social media, things done on social media, attitude to social media (learning), attitude to social media (connected), and school performance). Such contrasting disparities in the three models should be carefully interpreted and investigated.

Reasons for using social media also had a significant influence on school performance. Powers et al., 2012 reported that by interacting online, students are able to teach other students. If the student is keen to use social media for learning purposes, he or she could get direct benefits with regard to school performance. However, if the intention is to use it for the purpose of being connected, a direct influence on school performance is not observed. However, an indirect negative effect is observed, but through a mediating variable that effected the student in his lack of time spent doing homework, and lack of time with parents and friends.

7. Conclusions, implications, and future directions

Some benefits from using social media networks include sharing information and ideas and improving reading skills. Despite the benefits of participation of students in social media networks, its misuse could affect the academic life of the students and, thereby, their performance. As stated by Katz et al., 1974 in their gratification theory, the media chosen by people would compete with other sources of information. Therefore, as this study shows, social media networks compete with academic work for students' attention. It is therefore the responsibility of the student to make the right decision in relation to the use of social media networks. Moreover, Bandura's (1997) social learning theory states that "as the learning outcomes of students are influenced by the student's decision on his choice of situation (social media networks and participation) and peers (friendship networks), they could make the right decision in the usage of these media to bring about the positive outcome (academic performance) that is desired."

The research described here has implications for the better understanding of the relations between the various significant dimensions related to school children's social networking. The results should be of interest to parents, educators, education policymakers, and Internet policymakers, as well as researchers.

Given the fashionableness and popularity of social media and mobile technology, it seems unlikely that school educators will be able to curtail students' use of these media applications and forms. The focus group recommended that schools should encourage teachers to integrate social media into their classrooms, homeworks, and projects. The simplest application could be to remind students of class assignments and to drop ideas for discussions. Such positive views are also reported in literature (Blair and Serafini, 2014).

We live in a technology-driven world. Change is constant and overwhelming. In Abu Dhabi, policymakers and school teachers are finding that technology has disrupted their traditionally adopted methods, processes, and strategies that worked for their students. Hence, the interpretation is clear. As teachers embracing this changing technology, there is a

compelling call for using and adopting social media networks to leverage student engagement in its various applications. Such engagement will no doubt improve the delivery of curriculum in an innovative way and accommodate new directions in teaching that focus on "student-directed" learning style (Douglass and Sherrill, 2014).

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