



Chinese students' perceptions of social networks and their academic engagement in technology-enhanced classrooms

Ting Yin ^{a,*}, Jing Yin ^b, Zhujun Xu ^c

^a School of Foreign Languages, Guangdong Polytechnic Normal University, Guangzhou, Guangdong, 510665, China

^b School of Foreign Languages, Hengyang Normal University, Hengyang, Hunan, 421002, China

^c Human Resources Division, Guangdong Polytechnic Normal University, Guangzhou, Guangdong, 510665, China

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ABSTRACT

Using social networks as one of the new instruments of information and communication technologies in recent years has gained popularity. Social networks are used in various political, social, cultural, and educational fields. In education, students increasingly use social networks to create and maintain social relationships and support informal learning methods. The current study investigated the relationship between the use of social networks and academic engagement in Chinese EFL language learners. Using a convenience sampling method, the researcher invited 591 EFL students from Guangdong Province, China to participate in the study. The participants consisted of 307 male learners and 284 female learners, of whom 345 (58.38 %) were B.A., 234 (39.59 %) were M.D. and 2.03 % were Ph.D. To obtain the necessary data, the researcher employed two questionnaires. The researcher distributed the questionnaires that were Social Network Usage Questionnaire and Academic Engagement Questionnaire to the participants. Employing the multivariate regression method and Pearson correlation coefficient in SPSS and Amos, the researcher analyzed the collected data. The results show that there is a significant and positive association between learners' social network usage, their ethnographic factor (age), and their academic engagement. However, other ethnographic factors such as gender and educational level do not affect learners' social networks usage. Also, there is a significant and positive association between the amount of use of social networks for entertainment and components of academic engagement which are cognitive, emotional, and socio-behavioral factors. The use of technology, especially the use of social networks, enhances learners' academic engagement and increases their motivation, energy, and mastering abilities. They provide the ability to easy access for all learners and provide personalized/individual course materials.

1. Introduction

Today, the expansion of new technologies has affected various dimensions of human life such as political, social, cultural, security, and economic dimensions [1]. With the fading importance of time and place and the need for a common place to communicate, learners can communicate in a lot more straightforward manner in a virtual space. This new form of communication causes changes in the culture and identity of societies [2,3]. In the age of information, the Internet is the largest information carrier in the world and is considered the most powerful communication medium and educational tool [4–7]. This remarkable feature is clear in scientific

* Corresponding author.

E-mail address: yinting@gpnu.edu.cn (T. Yin).

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activities, communication, and social relations of information seekers [8].

After the emergence of the Internet, the Web emerged, which was created to increase efficiency and organize the resources available on the Internet. After the web, web 2 was created, which is the developed example of the traditional web. Web 2 was proposed in 2004 and emerged to solve the most important limitation of the traditional web, which was the inability to interact and establish mutual communication [5,9]. This limitation made the users passive in this environment, but after the emergence of Web 2, the possibility of interaction, participation, collaboration, and content creation by users also appeared [10,11]. The employment of instructive technologies, such as computers and telecommunications, has a high potential to work on the nature of instructive projects and promises to reach one of the most powerful educational and learning tools [12,13].

Social networks have a good potential for education due to being open, interactive, and social. Researchers showed that social networking tools have five effective functions including: creating intertwined groups, accessing more diverse views, building knowledge, and sharing them, mobilizing people, and coordinating resources and actions [10,14,15]. Virtual social networks are among the new phenomena that have formed due to the integration of different communication technologies in recent years [16]. These networks appeared in the late 1940s, and their evolutionary process has continued until today, and every day we see the progress and improvement of its facilities. Social networks provide a platform for social interaction and sharing of beliefs and knowledge between users [17]. At present, the users' acceptance of social networks is such that, it can be said that social networks, as one of the most influential services offered, have been able to create a tremendous transformation in the social system of different countries in the world in recent years [18,19]. The networks had the option to acquire a ton of ubiquity lately and this notoriety is as yet expanding, with the goal that they have more than a huge number of clients around the world. These networks have a fundamental capability in different streaming exercises with free memberships from clients. Social networks have been invited because of their different capabilities to advance the Web based way of life [14,15,20].

In the interim, EFL understudies and scholastics are among the principal clients of instructive advancements, including the Web and social networks [21–23]. Notwithstanding private applications, this device has many purposes in language educating, and it can extend the degree of information and capacity of EFL students and scholastics through speedy and modest admittance to data and logical assets. The advanced wise data environment is the consequence of the rise and continuous standardization of electronic cybernetic societal networks in exercises of the new hundred years [24,25]. Virtual social networks allow EFL learners to make their social relationships non-physical (virtual) possible so that they can communicate without having to be in the group or in their desired situation. In this new social media, the media is no longer the owner of the audience, there is no limitation of time and place, text, sound, and image are available to everyone and communication can be integrated with daily tasks. Meanwhile, most of all, EFL learners have used this social media in their lives [26,27].

Despite the high importance of these sites, there is still no definition that is acceptable to experts in this field, but what is agreed upon by most of them is to be able to communicate, interact and share content in such networks by creating a user account and connecting it to other people's accounts for building a personal network [28–30]. Youngsters will generally join informal communities due to their soul of variety, imagination, propensity to speak with others, interest, and interest in carrying on with an alternate life. Students can share their innovative ideas more easily in this way and receive others' opinions about it and develop it [31–34]. Therefore, social networks are places where people can introduce their ideas, express their personality traits, communicate with others, and maintain these connections. Consequently, it is very imperative to recognize the behavior and tendencies of students in using these social networks, and the results can create a better view and understanding of these networks and provide a more suitable platform for better use of these networks [35,36].

Social networks are not a tool for vanity, but if young people are not aware of the wrong functions of this social media, this tool will become a serious threat to young people and society. Social networks are like double-edged swords, if they are not used correctly, they will harm the users the most, so instead of preventing young people from using these social media, it is better to inform them about the opportunities and threats of this social media [37,38]. Today, social networks are a vital component of human society and are highly popular due to the facilities they provide to their users and are used every day. Notwithstanding private applications, this apparatus has many purposes in training and exploration, and it can expand students' information, capacity, and scholastics through fast and modest admittance to data and logical assets [39,40].

Changes in the social system caused by the emergence of new media, including the Internet and social networks, have even changed the way students and teachers communicate and the way of teaching at university levels [41,42]. Research on social networking in training is as yet restricted albeit accessible examination on social networks has zeroed in on personality, network designs, security, and mechanical issues so the requirement for research on social networks in instructive settings is presently perceived. This has fundamentally increased the ability of students to conduct research and share their findings with others. Social networks are considered as the most effective mass communication space in the world today, which despite their not so long existence, have a high penetration rate among young people [5,8,20,43,44]. New educational technologies bring about important changes in students' learning and the optimal utilization of these learning technologies improves and facilitates learning and education. Methodological theories such as constructivism theory, network individualism and communication theory support learning in virtual space and especially in social networks. Constructivism theory refers to the development of information by students individually or socially and supports the idea that there is no knowledge derived from the meaning attributed to the experience made by the learner or a group of learners. According to the theory of connectionism, learning in the digital age occurs as a process of questioning networks, and learning is the process of linking, growing, and guiding these networks. One of the advantages of communications is to pay attention to the evaluation of information or knowledge before receiving or learning it [39,40].

One of the main issues of human interest in the application of these technologies is to pay attention to its psychological aspects. Motivational variables, as one of the psychological dimensions, are among the main factors that affect the amount of time spent on

academic assignments, how information is processed, the use of learning strategies, the amount of persistence and perseverance when facing challenging assignments, and the amount of value that an assignment has for learners. These variables affect performance and academic engagement [45–47]. Motivation is the main cause of behavior, whether it is created in the conditions in the environment or inferred from behavioral, physiological manifestations, and personal reports. Motivation can be characterized as a variable that enables and directs conduct [43,48]. An important motivational variable that was examined in this research is academic engagement. A factor that is strongly related to academic engagement is academic enthusiasm. One of the factors in the academic success of learners is academic enthusiasm, which is defined as the excitement that learners spend in purposeful educational activities. Researchers have shown that the more students are engaged in academic issues and learning tasks, the more academic success they achieve [49–52].

Academic engagement is a mechanism that was proposed to appreciate and clarify academic breakdown and was regarded as the basis for reformist attempts in educational environments [53–56]. Various definitions of academic engagement have been provided. Some believe that the learner is associated with scholarly tasks just when the tasks require problem-solving abilities and undeniable level thinking abilities like assessment, basic, and creative thinking [57–59]. According to the definition, it can be said that learners are not involved in learning, but they are involved in assignments and activities that lead to learning. Researchers believe that in social networks, the term academic engagement refers to the energy that students spend in educational activities inside and outside the classroom. Some of these activities are participating in classroom activities and allocated tasks (assigned assignments), providing feedback, distributing resources and experience, and interacting and participating with professors and students [60–63].

In recent studies, academic engagement has three components: social-behavioral, emotional, and cognitive. Behaviors such as persistence while doing homework, study behaviors, regular participation in the classroom and class discussions are some of the behavioral indicators of academic engagement [64]. Cognitive indicators of academic engagement include attention to homework, learning and cognitive strategies, mastery and proficiency in assignments and preference for challenging assignments. Emotions and feelings such as anxiety, fatigue, enthusiasm and valuing the task are among the emotional indicators of academic engagement [65]. The above statements showed that it is important to investigate the impact of virtual social networks on learners' academic engagement, so the present study investigated the perceptions of students about social networks and their impact on their academic engagement in online classes.

1.1. Research questions

This study attempted to respond to the accompanying examination questions:

- RQ1.** What are the differences caused by demographic factors such as gender, age, and educational level to the Chinese EFL students' social network usage?
- RQ2.** How does Chinese EFL students' social network usage influence their academic engagement?

1.2. Research hypotheses

Based on raised research questions, two hypotheses were formulated to guide the objectives of the paper and strengthen the analysis:

- H1.** The demographic factors (age, gender, & educational level) cause a significant difference in social network usage.
- H2.** There is a significant association between language learners' social network usage (academic, socialization, entertainment, & informative) and their academic engagement (social behavior, cognitive, & emotional).

2. Review of the literature

The data advancement is achieved by the new experience of the students related to the previous data on the students. The speculation of mental constructivism makes reference to that the new experience made mental conflict and the understudies endeavored to conform to the new experience to get into the absorption cycle or endeavored to change in accordance with the new data. The speculation of mental constructivism is used as the reason for enlightening model arrangement by taking the certifiable situation in preparation. The understudies lose the mental equilibrium and endeavor to conform to get the concordance mental and to foster the data as the speculation of social constructivism of Vygotsky that has confidence in friendly collaboration and the setting of sharing data or analyzing with others. This activity prompts gaining data advancement. The students can confer their knowledge to colleagues and educators [60–62].

Background studies on the use of social networks on academic performance and academic engagement of learners show that social networks have a negative impact on academic engagement but a positive effect on academic engagement and its components [9,10,55]. The results of some studies show that the use of social networking sites can support students' academic engagement and academic success. To evaluate how social networking sites can affect students' classes and engagement, an empirical study was conducted with language learners employing Twitter for various academic discussions. The results of this research showed that the experimental group's academic engagement increased significantly over the control group [66].

Heiberger and Harper [67] have shown that there is a positive connection between the utilization of long-range informal communication destinations and understudies' scholarly commitment. The findings of other studies have shown that addiction to the internet and social network plays a significant role in reducing the academic motivation of learners and their academic enthusiasm.

Wanner and Palmer [68] conducted research titled understanding the role of social networks in academic engagement and satisfaction for undergraduate students. The result showed that students mainly use social networks to disseminate and maintain academic and research information. However, building communication networks and developing careers is one of the main reasons for using social networks. This research also stated that the use of social networks has a positive relationship with academic engagement and student satisfaction [65].

Shi et al. [27] directed a review named The Scholastic Commitment of Understudies and EFL Students Utilizing Informal Organizations. The outcomes showed that the experimental group (the individuals who utilized the virtual interpersonal organization) had a fundamentally upper degree of commitment and inspiration contrasted with the benchmark group (the people who didn't utilize the virtual informal community). Akbari, Naderi, Simons, and Pilot [69] investigated the academic involvement of students in virtual social networks and its use for language teaching (a case study of the Faculty of Nursing Education). The results showed that students are more involved in Facebook, WhatsApp, Google+, YouTube and Twitter. The participants mainly use social networks for learning, socializing, and entertainment. The majority believe that social networks have a positive effect on their academic performance. Sojayapan and Khlaisang [70] concentrate on the work of informal communities, understudy commitment, and the scholarly presentation of business understudies at the College of Applied Sciences in Malaysia. The results revealed that there is no direct relationship between social networks and academic performance. The results also showed that social networking improves students' engagement.

Wallace [71] entitled the role of using social networks in academic performance with the mediation role of informal learning and academic engagement. The outcomes affirmed that there is a critical negative relationship between the utilization of interpersonal organizations and scholastic execution, and there is a huge positive relationship between the utilization of informal communities and social and casual learning. The consequences of this examination likewise showed that there is no critical relationship between the utilization of interpersonal organizations and scholarly commitment. The way the examination model expected in the momentum research with change threw a tantrum, which showed that it made sense of a sum of 9 % of changes in understudies' scholarly execution. The standardized effect (without mediation) of social networks on academic performance was negative and its indirect effect (with mediation) was positive. The findings indicated that the indirect impact of using social networks on academic performance was not significant. Ganji et al. [72] directed a review entitled researching the connection between Web dependence and understudies' scholastic excitement. The discoveries of the review showed that there is a pessimistic and huge connection between Web habit and scholarly energy (close to home, conduct, and mental). The aftereffects of the relapse investigation showed Web habits can adversely anticipate understudies' commitment. Veldhuis, Alers, Malinowska, and Peng [73], investigated the relationship between media addiction and academic enthusiasm in students. The results showed that internet addiction had a negative correlation with academic enthusiasm. This correlation coefficient was statistically significant. Therefore, the hypothesis of the research that there is a relationship between the level of dependence on the Internet and academic enthusiasm was confirmed.

In general, social networks can play a very effective function in developing and enhancing the educational and scientific level of classrooms. By using social networks, students, and teachers, as well as students and professors, can expand the scope of the learning process beyond the boundaries of the classroom and interact with each other by using social network technologies and exchanging information and experiences. Social networks are flexible and user-friendly and can be used easily compared to learning other knowledge management systems [50,54]. It is a fact that several students and researchers share their self-provided facilities for feedback and communication by forming a group and following quite simple steps. Social networking programs play a key role in students' lives and students spend most of their time on them, so they are very important for teaching and learning environments [35, 36,74]. The use of technology, especially the use of social networks, helps to develop small learning communities, in such a way that all learners actively participate in it, and this is a suitable scaffolding to help learners develop the necessary skills and understand the processes in which they engaged. These networks enable students to establish positive relationships with other students, especially people of the same age and interests, and thus cause students' academic excitement and engagement [65,75–80].

Expanding the inspiration, excitement, and acquiring abilities of understudies; the capacity to rapidly extend the course satisfied and simple access for everybody; giving customized/individual course materials; creating a space for the virtual class as an innovative support for educational processes; the possibility of asking and answering questions about topics of interest with the members of the group, especially professors; illustrating lesson content for some students and strengthening group critical thinking, and team project-oriented learning are among the other benefits of using social networks in educational and curricular fields [81,82]. According to the review of the studies conducted in the literature, it was found that so far, a comprehensive study has not been conducted to examine the relationship between the research variables and the contribution of each of the variables separately. Therefore, the purpose of the current research is to determine the association between the use of social networks and academic engagement in students, to investigate the relationship between the use of social networks and ethnographic components, and to investigate the association between the utilizing of social networks and the components of academic engagement [5,44,83].

3. Method

3.1. Participants

To collect the required data, the researchers invited 650 EFL students from Guangdong Province, China. Among them, 591 EFL students accepted to participate in the study. The participants consisted of 307 male students (51.95 %) and 284 female students (48.05 %), of whom 345 (58.38 %) were B.A., 234 (39.59 %) were M.D. and 2.03 % were Ph.D. The examination went on for a semester (3.5 months) and information assortment required around multi-week. For the poll study, the analysts utilized the web-based survey

stage “Survey Star” which is well-known in the Chinese central area. A bilingual form (both English and Chinese) of the poll was utilized to grasp the rightness of the information and to work with understudies’ comprehension. The participants were volunteers to participate in this study. All of them were conscious of the objectives of this study and were fully aware of their participation in this study. All participants were also acceptable to leave the study at any time. The demographic information of the participants in this study is presented in [Table 1](#).

3.2. Conceptual framework

As per Chen et al. [41] constructivism sets that all significant the truth is dependent upon human works on, being built all through communication between people and their reality, and created and sent inside a basically social setting. The hidden supposition that will be that importance is developed and molded from objects with the dynamic commitment of the specialist. As per Cheng et al. [1], that’s what social constructivism sets significance is forced on the world by us, as opposed to existing on the planet autonomously of us. There are numerous ways of organizing the world, and there are numerous implications or viewpoints for any occasion or idea. This is in opposition to the objectivist view that truth and importance live in their items autonomously of any cognizance [53].

Ongoing improvements, for example, the shift towards online distributing media - Wikipedia, the spread of social labeling, and the reception of social systems administration applications, and a staggering move towards the acknowledgment of different perspectives and arranged implications, as well as a general, certain, inclination to show up at an impartial perspective - all highlight a requirement for embracing a social constructivist point of view [49]. Perceiving and tolerating the presence of numerous understandings of an item clearly has a course on semantic metadata interoperability as it suggests and represents contrasts in the translations of computerized objects among people, gatherings, nations, and geographic districts. The following conceptual framework is generally developed based on the existing review of the literature (See [Fig. 1](#)).

3.3. Instruments

To bring together the necessary data and provide answers to the research questions, the researcher employed two questionnaires. The researcher distributed the questionnaires that were Social Network Usage Questionnaire and Academic Engagement Questionnaire to the participants.

3.3.1. Social Network Usage Questionnaire

Subsequent to concentrating on the past writing on social networking utilization, it was found that few estimations had been created to explore social networking use. This scale is really founded on the reason for social networking site use. Since this scale has finished a corroborative variable examination, or given definite psychometric insights, for example, test-retest dependability coefficient gauges, it was a reliable and valid questionnaire to use in the current study. The Social Network Usage Questionnaire was designed by Gupta and Bashir in 2018. The questionnaire has 25 questions of a 5-point Likert scale that range from one (Not at all true of me) to five (Completely true of me). Generally, the questionnaire examines four Social Network Usage subcategories. Each category was measured through five to seven questions in the questionnaire. The first category was Academic: Sum items 1, 2, 3, 4, 5, 6, and 7. 7 items in total; range: 7–35. The second category was Socialization: Sum items 8, 9, 10, 11, 12, and 13. 6 items in total; range: 6–30. The third category was Entertainment: Sum items 14, 15, 16, 17, 18, 19, and 20. 7 items in total; range: 7–35. The fourth category was informative: Sum items 21, 22, 23, 24, and 25. 5 items in total; range: 5–25. The score of the respondents demonstrates the participant’s social network usages. First and foremost, to abstain from misconception, the analyst made an interpretation of the poll in Chinese. Two bilingual interpreters deciphered the survey, Then, three specialists in the field really looked at the pre-last form of the poll. The legitimacy of the survey had been checked in the past examination concentrates by leading exploratory variable examination and corroborative component investigation. The reliability of the questionnaire had been checked through conducting a pilot study with 50 learners of the same population. The results of Cronbach Alpha analysis show the reliability index of 0.95 ($\alpha = 0.95$).

3.3.2. Academic Engagement Questionnaire

After studying the previous literature of academic engagement, it was found that Kember and Leung 2009’s scale was actually based on the purpose of academic engagement, completed a confirmatory factor analysis (CFA), and provided detailed psychometric

Table 1
Demographic information of the participants.

		Gender	Age	Education
N	Valid	591	591	591
	Missing	0	0	0
Mean		1.48	26.46	1.44
Std. Deviation		.500	41.572	.536
Variance		.250	1728.269	.287
Skewness		.078	21.919	.653
Std. Error of Skewness		.101	.101	.101
Kurtosis		−2.001	510.348	−.775
Std. Error of Kurtosis		.201	.201	.201

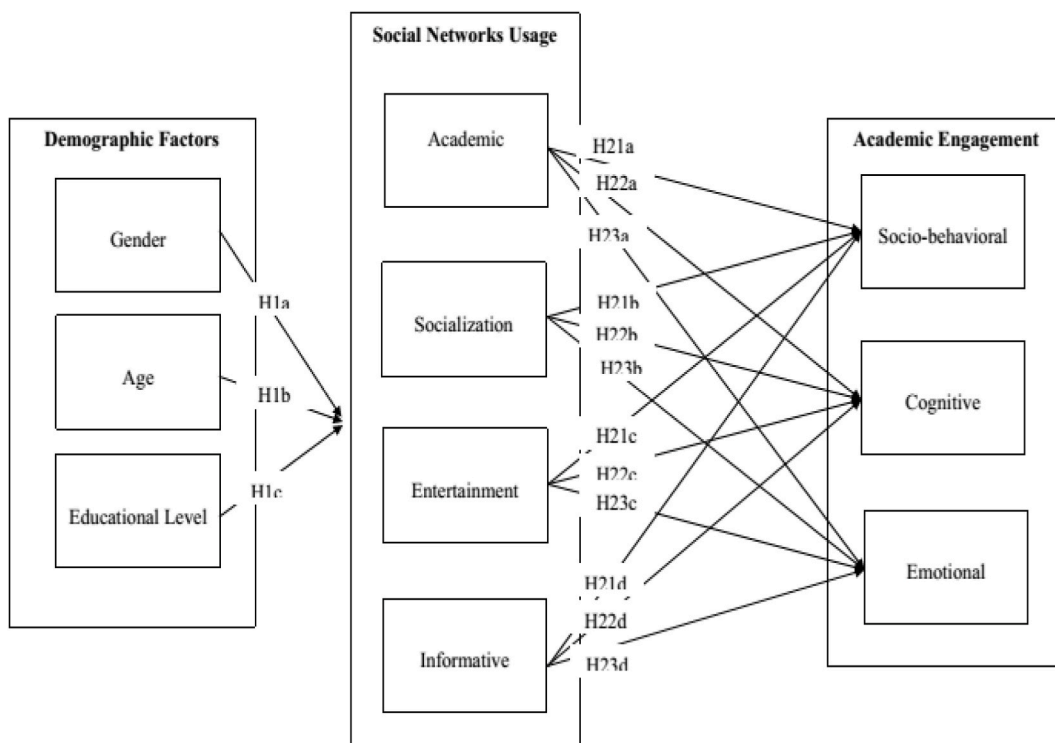


Fig. 1. Conceptual framework.

statistics. It was a reliable and valid scale to measure the participants’ social behavior, cognition, and emotional state. The Student Engagement Questionnaire was designed by Kember and Leung 2009. The questionnaire has 35 questions of a 5-point Likert scale that range from one (N Strongly disagree) to five (Strongly agree). Generally, the questionnaire examines three engagement subcategories. Each category was measured through eleven to twelve questions in the questionnaire. The first category was Socio-behavioral: Sum items 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, and 11. 11 items in total; range: 11–55. The second category was Cognitive: Sum items 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, and 23. 12 items in total; range: 12–60. The third category was Emotional: Sum items 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, and 35. 12 items in total; range: 12–60. The score of the respondents demonstrates the participant’s academic engagement. High scores show the academic engagement of the participants. Three specialists in the field actually look at the pre-last adaptation of the survey. The legitimacy of the survey had been checked in the past examination concentrates by leading an exploratory component investigation and corroborative variable examination. The reliability of the questionnaire had been checked by conducting a pilot study with 50 learners of the same population. The results of the Cronbach Alpha analysis show a reliability index of 0.98 ($\alpha = 0.98$).

3.4. Procedures

A priori power analysis was directed utilizing G*Power variant 3.1.9.7 to decide the base sample size expected to test the research questions. Thus, the obtained sample size of $n = 457$ was adequate to test the study hypothesis. To reach the objectives of the present study, the researcher distributed the questionnaires online via Wen Juanxing and via WeChat. Prior to data collection, we reported to the Academic and Ethics Committee of Gungdong Polytechnic Normal University in written form to obtain the permit of collecting data and we additionally affirmed that educated assent was acquired from all members for our ongoing review. Those members were educated that their information would just be utilized for research purposes and their data would be kept private. The researchers collected the required data efficiently at the end of April 2022. Altogether, 591 valid questionnaires were gathered from EFL students from Guangdong Province in China. The participants were also informed of their human rights to withdraw from the study if they sensed any discomfort. Since the teachers made no contact with the researcher, there were no interest conflicts between the researcher and participants. Using SPSS (version 25) and AMOS (version 24), the researcher analyzed the collected data.

4. Results

At the outset of the study and to check the reliability of the questionnaires (Social Network Usage Questionnaire & Academic Engagement Questionnaire), the final versions of the questionnaires were piloted with 50 participants of the same population. The results of using Cronbach Alpha coefficient, it showed the reliability index of 0.95 ($r = 0.95$) for Social Network Usage Questionnaire

and 0.98 ($r = 0.98$) for Academic Engagement Questionnaire. The results of these analyses are presented in [Table 2](#).

To break down the information into two areas of unmistakable measurements and inferential measurements, spss25 and Amos 24 programming were utilized. First and foremost, the enlightening insights present the focal markers and the scattering of examination factors. The results of this analysis were shown in the following tables.

The descriptive statistics in [Table 3](#) show that the mean variables of Sp Social Network Usage and Academic Engagement Questionnaire are equal to 35.05 and 61.62 with deviations of 11.41 and 21.89, respectively. Also, the Skew and Kurto indices are in the range (2- and 2) and show that the designation of factors is practically anticipated. One of the principal suppositions of the Primary Condition Techniques is the ordinariness of the exploration factors. To check the ordinariness of the examination factors, the specialist utilized the Kolmogorov-Smirnov ordinariness test, the aftereffects of which are as per the following:

The results of [Table 4](#) show that the normality of the data is not violated; therefore, parametric analyses can be employed. The following suspicion of the Primary Condition Techniques is the relationship of examination factors. To examine the relationship of examination factors, the specialist utilized the Pearson test, the consequences of which are as per the following:

The results of [Table 5](#) indicate that the correlation coefficient of Social Network Usage with Academic Engagement is 0.744 which is significant at the level of 0.05. The model was fitted in Amos 24 software. The results were obtained as follows. The model is depicted in [Fig. 2](#) (See [Fig. 2](#)).

The model was fitted in Amos 24 software. The results were obtained as follows. The standard estimation mode is depicted in [Fig. 3](#) (See [Fig. 3](#)).

The non-standardized estimation mode is depicted in [Fig. 4](#) (See [Fig. 4](#)).

According to the software output, Chi-square = 114.987, $df = 20$, and Probability level = .000, the chi-square test is critical ($Sig = 0.000 < 0.05$), so it tends to be reasoned that there is a huge distinction in the recurrence of factors.

CMIN represents the Chi-square worth and is utilized to think about assuming that the noticed factors and expected results are genuinely critical. All in all, CMIN shows assuming the example information and speculative model are an adequate fit in the examination. The value of interest here is the CMIN/DF for the default model and is interpreted as follows: If the CMIN/DF value is ≤ 4 it indicates an acceptable fit. The results of [Table 6](#) show that the value for CMIN/DF is 5.749 that near 4.

The results of [Table 7](#) reveal that the RMSEA for the study is 0.090 that is considered as borderline.

As an answer to the first research question, the results of [Table 8](#) indicate that age causes a significant difference in students' social networks usage. However, two other hypotheses related to the demographic factors are rejected. It means that gender and educational level do not cause a significant difference to students' social network usage.

As an answer to the second research question, the results of [Table 9](#) reveal that six subcategories related to association between EFL learners' social networks usage and academic engagement are accepted. The results show that there is significant association between Chinese EFL students' socialization, entertainment, and socialization usage of social networks and socio-behavioral aspect of academic engagement. The results also show that there is significant association between the usage of social networks and cognitive and emotional aspect of academic engagement. Generally, it means that there is a significant direct association between Chinese EFL students' social networks usage and their academic engagement.

The consequences of [Table 10](#) present the Normalized Relapse Loads for the informal community use and scholastic commitment factors. The outcomes show which of the factors remembered for the model added to the expectation of the scholarly commitment scores. The outcomes show that the biggest measurably huge worth is ascribed to the understudies who utilize interpersonal organizations for amusement. These values indicate that Entertainment uniquely explains about 37, 36, & 35% of the variance in the emotional, cognitive, and behavior scores respectively. The second variable is Socialization that uniquely explains about 35, 30, & 29% of the variance in the emotional, cognitive, and behavior scores respectively.

5. Discussion

The results of this study confirmed Heiberger and Harper [67], Shi et al. [27], and Veldthuis et al. [73], what that there is a positive relationship between the use of social networking sites and students' academic engagement. Up-to-date learning has become one of the lifestyles of modern society. Learners are constantly seeking information. To do this, most of them use digital technology and networks to acquire and share information. In addition, learning in social networks is largely self-motivated, independent, and informal, and an essential section of the academic experience [8]. The results of this study demonstrated that learning in social networks permits learners to manage and maintain the learning space and facilitate their learning activities and communicate with their peers. The results confirmed the usefulness of the usage of social networks in improving academic engagement and subsequently academic achievement. However, some universities still rely on traditional platforms such as learning and course management systems that cannot show the educational potential of social media [49].

This platform includes both hardware requirements (such as system type and CPU) and software requirements (such as operating system). The utilization of social networks as one of the new devices of data and correspondence advances lately has been enormously

Table 2
The results of reliability analysis of two questionnaires.

Questionnaire	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
Social Network Usage Questionnaire	.954	.955	25
Academic Engagement Questionnaire	.982	.983	35

Table 3
Central indicators and dispersion of research variables.

		Social Network Usage Questionnaire	Academic Engagement Questionnaire
N	Valid	591	591
	Missing	0	0
Mean		35.0592	61.6244
Std. Deviation		11.41920	21.89438
Variance		130.398	479.364
Skewness		.445	.604
Std. Error of Skewness		.101	.101
Kurtosis		.642	.773
Std. Error of Kurtosis		.201	.201
Minimum		19.00	35.00
Maximum		95.00	173.00

Table 4
The results of tests of normality.

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Social Network Usage	.091	591	.000	.944	591	.000
Academic Engagement	.122	591	.000	.916	591	.000

*. This is a lower bound of the true significance.

^a Lilliefors Significance Correction.

Table 5
The correlations among research variables.

		SI	AE
Social Network Usage	Pearson Correlation	1	.744 ^a
	Sig. (2-tailed)		.000
	N	591	591
Academic Engagement	Pearson Correlation	.744 ^a	1
	Sig. (2-tailed)	.000	
	N	591	591

^a Correlation is significant at the 0.01 level (2-tailed).

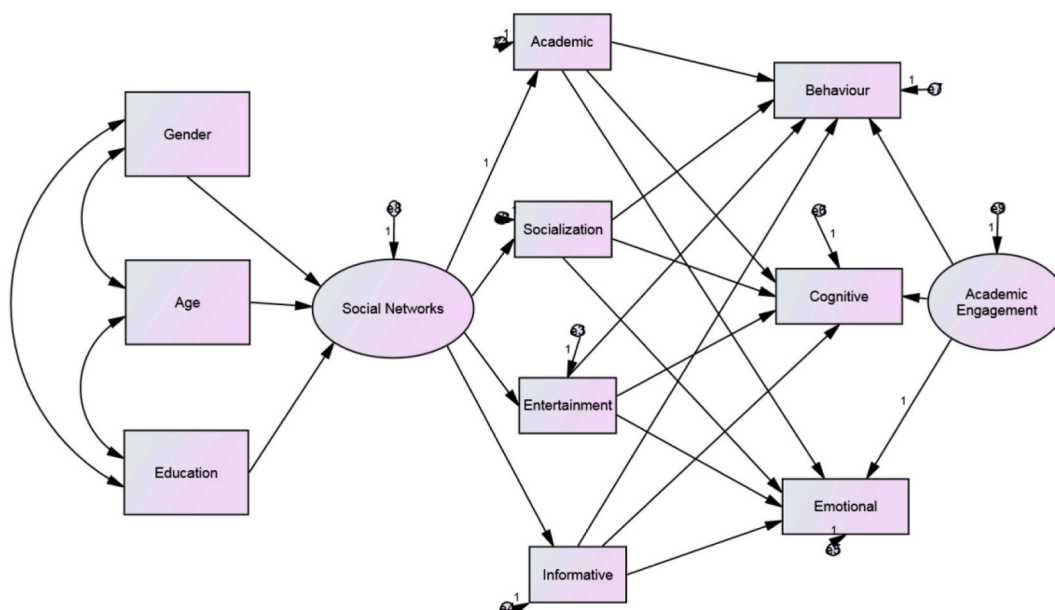


Fig. 2. The research models.

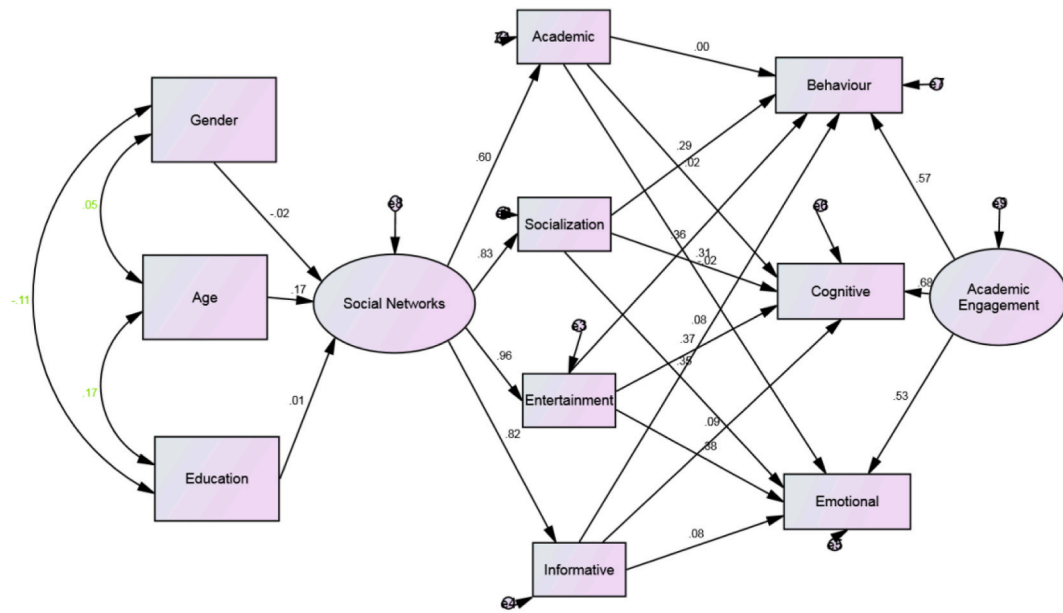


Fig. 3. Model fit in the standardized estimation mode.

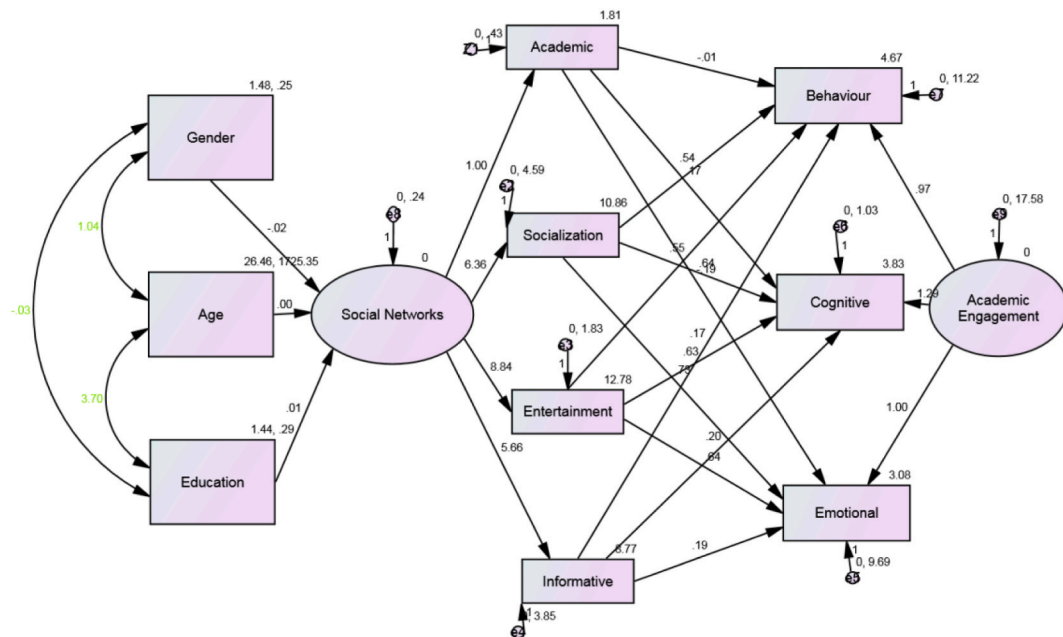


Fig. 4. Model fit in the non-standardized estimation mode.

Table 6
The Results of Chi-square value.

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	45	114.987	20	.000	5.749
Saturated model	65	.000	0		
Independence model	20	3927.861	45	.000	87.286

Table 7
The results of root mean square error of approximation.

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.090	.074	.106	.000
Independence model	.382	.372	.393	.000

Table 8
Estimates of regression weights for the demographic variables.

			Estimate	S.E.	C.R.	P
Social Networks	<—	Gender	-.017	.042	-.395	.693
Social Networks	<—	Age	.002	.001	3.818	***
Social Networks	<—	Education	.007	.040	.177	.859

Table 9
Estimates of regression weights for the subcategories of social networks usage and academic engagement.

Hypothesis				Estimate	S.E.	C.R.	P
H21a	Behavior	<—	Academic	-.011	.323	-.033	.974
H22a	Cognitive	<—	Academic	.173	.339	.511	.610
H23a	Emotional	<—	Academic	-.193	.320	-.603	.546
H21b	Behavior	<—	Socialization	.544	.094	5.779	***
H22b	Cognitive	<—	Socialization	.638	.099	6.455	***
H23b	Emotional	<—	Socialization	.728	.093	7.790	***
H21c	Behavior	<—	Entertainment	.550	.095	5.775	***
H22c	Cognitive	<—	Entertainment	.627	.100	6.270	***
H23c	Emotional	<—	Entertainment	.642	.095	6.796	***
H21d	Behavior	<—	informative	.168	.103	1.624	.104
H22d	Cognitive	<—	informative	.200	.108	1.850	.064
H23d	Emotional	<—	informative	.189	.102	1.846	.065

Table 10
Standardized regression weights for the variables.

			Estimate
Social Networks	<—	Gender	-.017
Social Networks	<—	Age	.166
Social Networks	<—	Education	.008
Behavior	<—	Academic	-.001
Cognitive	<—	Academic	.018
Emotional	<—	Academic	-.020
Behavior	<—	Socialization	.292
Cognitive	<—	Socialization	.308
Emotional	<—	Socialization	.355
Behavior	<—	Entertainment	.356
Cognitive	<—	Entertainment	.365
Emotional	<—	Entertainment	.378
Behavior	<—	informative	.081
Cognitive	<—	informative	.087
Emotional	<—	informative	.083

invited [35,36]. The spearheading intelligent and shared elements of Web 2 apparatuses and administrations, particularly social networks, stand out enough to be noticed of numerous analysts in different fields to concentrate on this peculiarity and its applications in different fields. According to Lai et al. [3], Web 2 services are one of the most widely discussed issues in the field of information science and technology [11]. In contrast with other social media and Web 2 devices, social networks are the quickest and most famous advancements. In training, understudies progressively utilize social networks to make and keep up with social connections and associations and keep up with casual learning techniques and learning exercises. In short, Web 2 tools are more than just a set of tools and features. There are powerful ideas behind these tools and facilities that have great potential for education and research; including public content and texts for users, the concept of a wide participation network, and a low border for easy access. As a result, students interact with learning by using social networks and manage their own learning [30]. The results of this study were consistent with Hung's [30] findings and demonstrated that participation in the social network had a positive impact on different aspects of their learning; from their motivation to their engagement.

The results of the main hypothesis of the research showed that there is a positive and considerable association between academic

engagement and the amount of use of social networks. That is, the more hours students spend on social networks, the higher their academic engagement. The results of this study are consistent with the findings of Kim et al. [45], Akçayır and Akçayır [8], Asiksoy and Özdamli [28], Bredow et al. [57], Chen et al. [41], and Demirel [40]. In explanation, it can be said that the importance of interaction in learning has been emphasized in new learning theories. This learning theory emphasizes the importance of the role of technology in the learning process and the relationship of people with technology and relationships with other people.

Learners who use social networks focus on tasks for a longer period and find assignments that they previously considered boring more interesting and are more eager to participate and share in discussions and ask more questions. Computer and e-learning environment has the advantage of making learning more exciting and as a result, it motivates and engages language learners in learning tasks. The results of this research are inconsistent with the research of Ganji et al. [72] and Junco et al. [66]. The results of these studies showed that addiction to the Internet and social networks caused a decrease in academic motivation and, as a result, a decrease in academic engagement and the relationship between the variable of Internet addiction and academic motivation and academic engagement is negative and significant. In explanation, it can be said that these networks lead to students being able to establish a positive relationship with other students, especially people of the same age and interests, and thereby cause the motivation and academic engagement of the learner. Increasing students' motivation, engagement, and learning skills, the ability to quickly expand course content and easy access for all students, providing personalized/individual course materials are among the advantages of these networks [14].

One of the interesting results of this research is the higher academic engagement of students who use social networks for entertainment purposes. The results show that social networks have the ability to be used in a learning environment because it improves students' academic engagement in class and then their academic success and achievements. The results of this present study also showed that there is no significant difference in the academic engagement of males and females. However, the results of this research are different from some previous researches. The disparity in the results of previous research with this research can be attributed to the different statistical population and the cultural difference of different societies [15].

6. Conclusion

In general, the results of the present study showed that there is a positive and significant association between the amount of use of social networks and academic engagement. The more hours students use social networks, the higher their academic engagement. In a short period of time, data and correspondence innovation and social networks have become essential parts of present-day cultures. In numerous nations, alongside perusing, composing, and number-crunching, understanding data and correspondence innovation and dominating the essential abilities and ideas of data and correspondence innovation have been viewed as the focal piece of advanced education in these social orders. In the field of education and training, communication technology is a set of tools and combinations of computer use and communication that support the learning process and a wide range of educational activities in different ways for professors and students [35,83].

The changes brought about by social networks are more fundamental than industrial changes and transformations that is why organizations, especially educational organizations, are forced to use the latest technological achievements to achieve the highest level of improvement in their abilities in order to maintain and survive. Statistics show that social networks have attracted many users and users have made these networks a part of their lives. Therefore, professors use these networks to communicate and involve students, as well as increase enthusiasm and engagement in education. Social networks have even changed the way of communicating between students and professors and the way of teaching at different educational levels. Students have expanded the scope of their learning process beyond the boundaries of the classroom and use social networks as a key factor in the process of creating knowledge and sharing content [81].

One of the main features of using social networks in teaching and learning is the boldness of collaborative and interactive learning, individual communication, and class interaction, and it easily increases the possibility of discussion with classmates, the possibility of understanding and accepting the opinions of others, and the formation of knowledge based on social agreements. Social networks keep up with different types of understudies getting the hang of, including useful learning, social learning, genuine learning, agreeable learning, intuitive learning, and non-formal learning. Albeit the primary reason for social networks when it was first presented was social purposes. As of now, improving understudy commitment through social networks is perhaps the main issue in expanding learning and showing in advanced education. It seems that education and culture building and continuous monitoring of social networks and planning for the future can be two basic suggestions for policymakers and practitioners. These programs can lead to the increase of students' engagement, learning, motivation and enthusiasm in academic and scientific affairs, and ultimately academic success in social networks. Therefore, it is recommended to make decisions for students' better knowledge and use, so that students, while using social networks for entertainment, get to know its other functions such as commercial and educational capabilities. Future studies can focus on cultural differences and technology literacy of students in different educational environments that might influence their engagement significantly.

Notwithstanding these implications, this study has limitations, as well. The information was gathered from just a single setting compelling the generalizability scope. Besides, an unadulterated quantitative plan was utilized in this review, while blended strategies and subjective examinations might have given further bits of knowledge. Moreover, foundation factors were not viewed in that frame of mind of the three factors, while orientation, age, training, and so on may influence EFL understudies' acknowledgment of innovation. To connect the holes, future analysts can utilize different exploration instruments (interviews, perception, journals, and reflections) to decide the connection between the factors under study.

Ethics statement

The research study was authorized by the Academic and Ethics Committee of Guangdong Polytechnic Normal University under the number of ethics AEGPNU2301.

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Data availability statement

Data will be made available on request.

CRedit authorship contribution statement

Ting Yin: Writing - original draft, Writing - review & editing. **Jing Yin:** Resources. **Zhujun Xu:** Funding acquisition.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.heliyon.2023.e21686>.

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