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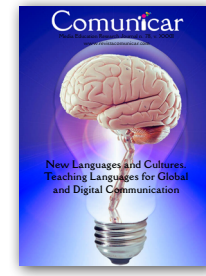

Analyzing the Impact of Digital Media on Promoting High-Quality Skiing Education: A Case Study of Online Tutorials and Social Media Campaigns

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ABSTRACT
This study investigates the impact of digital media on promoting high-quality skills by assessing its impact on collaborative education and technological skills within Chinese higher education. A survey-based strategy was adopted and three explanatory variables were incorporated, namely students' learning using social media, students' experience of using social media in teaching and social media usage frequency. The learner's motivation was also included as a mediator. The study collected data from university students across mainland China, focusing on those engaged in learning using social media platforms. Structural Equation Modelling (SEM) was employed to analyze the data. The findings showed that usage of social media for learning positively impacts collaborative education, indicating students' preference for interactive projects and online lectures on social media. Regarding the impact on technological skills, the findings showed that social media usage frequency positively influenced technological skills among students in Chinese universities. Additionally, it was found that learner's motivation significantly mediated the association of social media usage frequency with collaborative education and technological skills. Learner's motivation played a significant mediating role in the relationship between students' experience of social media learning and collaborative education. The findings hold implications for educators, institutions, and policymakers striving to leverage digital media to advance high-quality skills in educational settings.

KEYWORDS
Digital Media, Skills Development, Social Media, Higher Education.

RESUMEN
Este estudio investiga el impacto de los medios digitales en la promoción de competencias de alta calidad evaluando su repercusión en la educación colaborativa y las competencias tecnológicas dentro de la enseñanza superior china. Se adoptó una estrategia basada en encuestas y se incorporaron tres variables explicativas, a saber, el aprendizaje de los estudiantes utilizando las redes sociales, la experiencia de los estudiantes en el uso de las redes sociales en la enseñanza y la frecuencia de uso de las redes sociales. La motivación del estudiante también se incluyó como mediador. El estudio recopiló datos de estudiantes universitarios de China continental, centrándose en los que aprendían utilizando plataformas de redes sociales. Se utilizó Modelos de Ecuaciones Estructurales (MES) para analizar los datos. Los resultados mostraron que el uso de redes sociales para el aprendizaje influye positivamente en la educación colaborativa, lo que indica la preferencia de los estudiantes por los proyectos interactivos y las clases en línea en las redes sociales. Con respecto al impacto en las competencias tecnológicas, los resultados mostraron que la frecuencia de uso de las redes sociales influía positivamente en las competencias tecnológicas de los estudiantes de las universidades chinas. Además, se descubrió que la motivación del alumno medió significativamente en la asociación de la frecuencia de uso de las redes sociales con la educación colaborativa y las competencias tecnológicas. La motivación del alumno desempeñó un papel mediador significativo en la relación entre la experiencia de los alumnos con el aprendizaje a través de las redes sociales y la educación colaborativa. Las conclusiones tienen implicaciones para los educadores, las instituciones y los responsables políticos que se esfuerzan por aprovechar los medios digitales para fomentar las competencias de alta calidad en los entornos educativos.

PALABRAS CLAVES
Medios Digitales, Desarrollo de Competencias, Redes Sociales, Educación Superior.

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1. Introduction

The widespread adoption of digital technology has prominently captured the interest of researchers, particularly in examining the impact and effectiveness of digital media in learning and teaching processes and outcomes (Bourbour, 2023; Haleem et al., 2022). Additionally, the popularity of social media among students has experienced a significant surge in recent years due to advancements in Web 2.0 tools (Xue & Churchill, 2022). The extensive adoption of social media is evident from the staggering number of over 4 billion active users worldwide (Dixon, 2023). These technological and digital tools have demonstrated their potential in the domain of learning and teaching, offering functions like e-learning tutorials, the exchange of documents, allowing virtual communication, and access to knowledge information (Hosen et al., 2021; McGuinness & Fulton, 2019). A recent review by Manca (2020) highlighted that higher education students primarily engage in content development, peer learning and assessment discussions on various social media platforms like Instagram, Pinterest, and Snapchat.

The Chinese government has heavily invested in higher education as the number of public universities increased five-fold, growing to approximately 2500, and a similar trend was observed in private institutions, which grew to 500 private universities by 2019 (Mok & Marginson, 2021). In terms of social media usage, roughly 485 million population in China have adopted numerous social network sites, employing them for diverse social and professional reasons (Jiang et al., 2018). Additionally, China has emerged as a prominent country in implementing digital technologies in education (Djeki et al., 2022). As a result, the potential of social media for teaching and learning activities has captured increasing interest and attention from the academic community (Barrot, 2020). Chinese students utilized WeChat, a versatile mobile app, to enhance their pronunciation learning by receiving feedback from programmed automatic speech recognition systems (Dai & Wu, 2023). Angelova and Zhao (2016) highlighted that online tutorials can enhance teaching experience, increase knowledge and improve language skills.

Social media learning experience is linked with enhanced motivation of students (Akgündüz & Akınoğlu, 2017), where motivation and learning using online methods lead to enhanced student achievement (Rafiola et al., 2020). Several studies have provided evidence of academics using social media for personal, professional, and teaching purposes (Johnson & Veletsianos, 2021). In terms of specific social media platforms, researchers have found that Facebook groups offer an effective means of supporting learning, with benefits that traditional online Learning Management Systems may not provide (Barrot, 2020). The WeChat-based classroom approach in China enhanced higher education achievement and critical thinking skills (Liu & Zhang, 2022). Similarly, video streaming services in Japan were employed to facilitate foreign language learning, specifically for improving reading, vocabulary, and listening comprehension (Dizon, 2021).

There is a growing call for a deeper understanding of the role of technology in influencing student knowledge and skills. Amid this extensive transformation of traditional teaching and learning methods, numerous students in higher education have become inclined toward learning using digital media (Angelova & Zhao, 2016; Herrmann et al., 2021). The concept of using learning technology is instrumental in aligning with students' skills, with the aim of fortifying teaching practices and ultimately leading to improved student outcomes, such as student engagement (Bond et al., 2020). Greenhow et al. (2019) discussed the increasing significance of social media in collaboration among teachers, students and the ability of social media to impact learning and skills of students.

Therefore, the present study aimed to analyze the role of digital media, specifically the use of social media, in promoting high-quality skills among Chinese university students. However, the question remains whether the experience of learning and frequent use of social media leads to improved knowledge and skills, as studies have focused largely on the adoption of blended learning in the context of Chinese higher education (Yu et al., 2023). There was a need to evaluate learning using social media and online tutorials to enhance the skills and collaboration of students.

This study determined the impact of students' experience of using social media in learning, and students' experience of using social media in teaching and frequency of acquiring technological skills by using social media. Additionally, it assessed whether a learner's motivation plays a significant mediating role in the relationship between the independent and dependent variables. With China's higher education sector experiencing continuous expansion and transformation (Mok & Marginson, 2021), this research addressed a critical area of interest of innovative learning approach for education stakeholders. The study's outcomes can pave the way for innovative and effective educational practices, promoting a learner-centric approach that fosters collaboration and high-quality essential skills for thriving in the digital age.

2. Literature Review

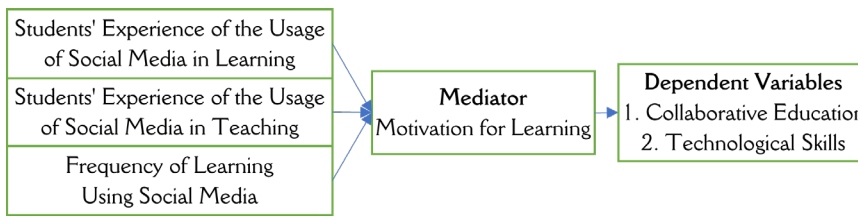
2.1. Theoretical Background

Connectivism theory is utilized to provide the association between digital platforms and skills development (Glassner & Back, 2020; Qureshi et al., 2023). Connectivism theory in this regard postulates that social interactions can play a crucial role in supporting the development of knowledge and skills (Sozudogru et al., 2019). In the current digital era, information and communication technology can be integrated into the learning process. Within the framework of connectivism theory, engaging in dialogue and sharing ideas lead to enhanced knowledge, interaction and skills (Glassner & Back, 2020). This theory has gained significant attention related to digitalization concepts, particularly to study social media usage (Sozudogru et al., 2019), and has been applied to various digital platforms such as social media, to enhance students' capabilities and learning (Qureshi et al., 2023).

Connectivism theory highlights assumptions that allows the understanding of learning in today's digitalized world (Bozkurt, 2023). This theory highlights that digital media has become a global platform that can affect learners' capabilities, with social media being a prominent digital tool for these activities (Chu, 2020). Digital technologies have transformed social media into a crucial tool that can be utilized by students, as individuals use it to exchange information, engage in virtual communication, and develop skills (Glassner & Back, 2020). In line with the principles of Connectivism, Qureshi et al. (2023) evaluated the association between social media usage, interaction, collaborative learning and students' ability and potential. Similarly, Hosen et al. (2021) have utilized the theory to explore the functions of social media for enhancing students' knowledge. The underlying foundation of this study was that the usage of social media, along with personal motivations, can influence the knowledge and skills, and learning processes of students.

Figure 1 outlines the theoretical framework adopted for this study, stating the independent variables of students' experience of the usage of social media in learning, students' experience of the usage of social media in teaching, and frequency of learning using social media. The framework also shows the mediating variable of motivation for learning and two dependent variables namely collaborative education and technological skills.

Figure 1: Theoretical Framework.



2.2. Social Media for Boosting Collaborative Education

Social media is often used in the context of digital media as it utilizes digital tools. Social media enhances collaborative education among students by providing a medium for communication and resource sharing. In this way, a sense of community is created (Orfan et al., 2021). Students can utilize social media to collaborate with other fellow students, ask different questions, and share different ideas. Furthermore, group chats and discussion platforms speed up communication and allow students to work together to solve different problems (Prescott et al., 2013). Social media is a medium for sharing of various resources such as articles, informative videos and similarly other learning materials. This assists students in developing a deeper understanding of the subject (Xodabande, 2017). Hence, social media develops a sense of community among students, hence promoting their high-quality skills, resulting in better engagement and higher motivation (Luo et al., 2022). By working together in a collaborative manner and supporting each other, students feel more linked to the education process and more motivated for their own success (Zikmund & Babin, 2010). Hence, students' experience of using social media in learning positively and significantly affects collaborative education.

Similarly, social media can positively affect collaborative education in a teaching context. Social media is a precious tool for teachers that enhances collaborative learning in a classroom. By utilizing social media, teachers are able to create a more dynamic education atmosphere that promotes high-quality skills like

collaboration and interaction among students (Tantarangsee et al., 2017). One method of how social media is incorporated into teaching is the formation of online discussion forums. These forums are utilized to facilitate classroom discussions, promote peer-to-peer learning and provide a medium for students to discuss their ideas and thoughts. By allowing students to interact with each other online, teachers inculcate a sense of community and promote collaboration among students (Taheryar, 2017).

Another method where social media is utilized in teaching is the formation of online learning communities. These communities use social media links to connect students with one another and with the experts in a particular field, providing a medium for sharing resources, clarifying confusion and collaborating on projects (Noori et al., 2022). Social media is also used to facilitate group assignments and projects. By forming online groups and giving students a platform for collaboration, teachers can motivate students to work together and complete assignments. This also builds teamwork skills and develops a sense of mutual responsibility among the students (Sife et al., 2007). Social media is also utilized to give students access to a broader range of resources and learning materials. By sharing different articles, informative videos and other materials on social media platforms, teachers pave the way for students to new ideas and knowledge dimensions and motivate them to discover topics that they may not have otherwise explored (Aragon, 2007). Hence, social media is a useful tool for teachers in promoting high-quality skills among students.

Similarly, the frequency of learning using social media positively affects collaborative education. By utilizing social media to encourage group work and collaboration, teachers bring students to work together to solve problems and complete their assignments and projects (Haidari et al., 2020). Social media also provides students access to a broader range of resources and learning materials. By utilizing social media on a regular basis to share informative articles, videos, and other resources, teachers can incorporate new thoughts and perspectives in students' minds and motivate them to discover topics that they may not have otherwise discovered (Ansari & Khan, 2020). Moreover, the frequency of learning using social media positively affects collaborative education by encouraging a more dynamic and engaging education atmosphere. By regularly including social media in the learning experience, teachers produce a more collaborative and engaging learning atmosphere that makes students to play an active part in their own learning as well as the learning of their peers (Babury & Hayward, 2014). In this way, the frequency of learning using social media has an important effect on collaborative education. So, according to the findings discussed above, the following three hypotheses are proposed:

H1. Students' experience of using social media in learning has a positive impact on collaborative education.
H2. Students' experience of the usage of social media in teaching has a positive impact on collaborative education.
H3. The frequency of learning using social media has a positive impact on collaborative education.

2.3. Social Media for Boosting Technological Skills in Students

The experience of using social media in education and learning has a positive and significant effect on students' technological skills (Lea, 2019). Social media provides students with exposure to a variety of digital tools and media. By using social media frequently, students can develop skills and expertise in digital communication, collaboration and content creation. These skills are applicable in a variety of contexts, i.e., from educational assignments to professional settings (Mushtaq & Benraghda, 2018). By using social media to connect with fellows and teachers, students enhance their self-directed education, critical thinking and problem-solving skills. These skills are very important in today's rapidly transforming digital landscape, in which the power to adapt and learn new skills is essential for success (Redecker et al., 2010). Furthermore, using social media in learning also enhances technological skills of students by giving them exposure to various digital tools (Lea, 2019). The utilization of social media in teaching has a positive effect on students' technological skills. By utilizing social media to collaborate with fellows and teachers, students are developing multiple skills like brainstorming, problem-solving and idea creation. These skills are very important to survive in the modern world (Sife et al., 2007). Further, the frequency of learning by utilizing social media affects technological skills by promoting innovation and creativity. Students enhance their creativity and innovation skills by utilizing social media to share thoughts and collaborate with fellows (Cullen et al., 2009). Based on these findings, the following three hypotheses are proposed:

H4. Students' experience of using social media in learning has a positive impact on enhancing the technological skills of students.

H5. Students' experience of the usage of social media in teaching has a positive impact on enhancing the technological skills of students.
H6. The frequency of learning using social media has a positive impact on enhancing the technological skills of students.

2.4. Mediation of Motivation for Learning between Students' Experience of Using Social Media and Collaborative Education among Students

Motivation for learning is important in students' experience of utilizing social media in learning and collaborative education (Oh et al., 2020). Motivation for learning mediates students' experience of utilizing social media in learning by promoting engagement and participation. When students are encouraged to learn, they are more likely to actively interact with the content and participate in discussions and activities. This helps to develop a more collaborative learning atmosphere, improving the overall learning experience (Ala-Mutka, 2010). Moreover, motivation for learning mediates students' experience of utilizing social media in learning by spreading self-directed learning. When students are encouraged to learn, they probably take ownership of their learning and search out resources and informative materials on their own. This helps form a more personalized learning experience, which can improve the overall learning experience (Peña-López, 2008). When students are encouraged to learn, they are more favorable to accept challenges and consider them as opportunities for growth. This helps to form a more positive and supportive learning atmosphere (Heid et al., 2009).

Similarly, motivation for learning has an important role in students' experience of utilizing social media in teaching and collaborative education (Ansari & Khan, 2020). Motivation for learning mediates students' experience of utilizing social media in teaching by playing an important part in developing students' digital literacy skills. This is leading towards a more comprehensive and all-rounded educational experience, which is preparing students for the modern digital world (Hulme, 2009). Moreover, Motivation for learning mediates students' experience of utilizing social media in teaching by promoting a sense of purpose among students in the learning procedure. When students are encouraged to seek information, they better understand the content's importance and value, which helps form a more logical and collaborative learning experience. This leads to a better understanding and retention of the concepts, which enhances the overall learning experience (Cullen et al., 2009).

The frequency of learning utilizing social media and collaborative education assists in developing a lifelong learning. When students are encouraged to learn, they search for opportunities for their growth and development. This leads towards a more fulfilling and positive life journey (Redecker, 2009). Motivation for learning is crucial in affecting the frequency with which students learn using social media as well as collaborative education mediums. It is the driving factor that motivates students to actively interact with such digital learning resources (Khan et al., 2021). Students that are driven to acquire knowledge are more inclined to search out educational material as well as participate effectively in collaborative endeavors thus promoting their high-quality skills. This drive can come from a variety of sources, including individual interests, career goals, or an honest desire to learn (Chu et al., 2021). Motivated students are more likely to follow academic accounts, join related groups, as well as devour educational information on an ongoing basis on social networks (Nelson et al., 2023). As they diligently seek knowledge and discuss their ideas with others, their passion creates a never-ending cycle of inquiry and learning. This not just improves their individual understanding but also improves the virtual community's collective experience of learning (Townley, 2020). Students that are motivated are not just more inclined to begin and continue participating in educational activities, but also are inclined to do this more frequently. The constant practice as well as reinforcing of vital skills like teamwork, communication, critical thinking, as well as problem-solving result from this sustained involvement (Wrahatnolo & Munoto, 2018). In addition, motivation improves a student's capacity for time management, adaptability to a variety of learning situations, and leadership traits in group settings (Mitsea et al., 2021). So, according to the findings discussed above, the following three hypotheses are proposed:
H7. Motivation for learning significantly mediates students' experience of using social media in learning and collaborative education.
H8. Motivation for learning significantly mediates students' experience of the usage of social media in teaching and collaborative education.
H9. Motivation for learning significantly mediates the frequency of learning using social media and collaborative education.

2.5. Mediation of Motivation for Learning between Students' Experience of Using social media and Technological Skills of Students

Motivation for learning is also an important factor that significantly mediates students' experience of utilizing social media in learning and their technological skills. Motivation for learning assists students in enhancing the technological skills essential to efficiently utilize social media in the learning procedure. When students are encouraged to learn, they search for opportunities to enhance their technological skills, which assist them in efficiently navigating social media platforms and utilizing them to improve their learning experience (Aragon, 2007). Moreover, motivation for learning helps develop a growth mindset, further enhancing students' technological skills. When students are encouraged to learn, they find challenges and issues as opportunities for growth and development, which assists them in facing technological challenges and enhance the skills essential to efficiently utilize social media in the learning procedure (Tippett & Kwak, 2012).

Similarly, motivation is a basic factor in how students approach learning and can affect how they experience using social media in teaching and their technological skills. When students are encouraged to learn, they interact with social media and utilize it as equipment for learning (Cullen et al., 2009). Additionally, it encouraged students to develop and enhance their technological skills, which further enhanced their experience of using social media in teaching. On the contrary, when students lack motivation, they are less likely to interact with social media or utilize it to promote their learning. This leads towards a less positive experience of utilizing social media in teaching and stops the development of their technological skills (Lusoli & Miltgen, 2009).

Similarly, motivation is a significant factor in analyzing how often students utilize social media for learning and how efficiently they enhance their technological skills. When students are encouraged to learn, they search for chances to utilize social media as equipment for learning. This paves the way for more frequent utilization of social media for learning and more interaction with technology. Moreover, motivated students enhance and improve their technological skills, which further promotes their experience of utilizing social media in learning (Soon & Park, 2009). On the contrary, when students are low in motivation, they are less likely to utilize social media in learning or utilize it in a way that supports their learning. This leads towards infrequent use of social media for learning and less interaction with technology (Tippett & Kwak, 2012). Furthermore, when students lack encouragement, they don't enhance their technological skills, which can limit their ability to efficiently utilize social media for learning (Tippett & Kwak, 2012). So, according to the findings discussed above, the following three hypotheses are proposed:

H10. Motivation for learning significantly mediates students' experience of using social media in learning and technological skills of students.

H11. Motivation for learning significantly mediates students' experience of the usage of social media in teaching and technological skills of students.

H12. Motivation for learning significantly mediates the frequency of learning using social media and the technological skills of students.

3. Research Methodology

3.1. Research Design

The present research adopted a positivist philosophical view and employed a survey-based strategy to investigate the impact of digital media on promoting high-quality skills in the Chinese higher education context. The research framework aims to establish a causal relationship between the variables under study which aligns with the explanatory nature of the study. Drawing from a positivist perspective, the researcher employed deductive reasoning to propose the research model and formulate hypotheses (Creswell & Creswell, 2017). The study focused on Chinese higher education to assess the influence of digital media on fostering high-quality skills. Using a quantitative approach, the study aimed to understand how digital media, such as online tutorials and social media platforms, made an impact on technological skills and collaborative education in higher education.

3.2. Sampling and Participants

The researcher employed a convenience sampling technique to recruit participants for this study, which offered several benefits (Etikan et al., 2016). These advantages included the ease of reaching participants

in close proximity along with their accessibility and availability, and willingness to participate voluntarily (Etikan et al., 2016). The research targeted university students from different campuses and departments throughout mainland China who had either currently participated in or previously participated in using social media for learning and engagement. These students were invited to participate in the survey and provide their responses. A questionnaire was sent to all these students. A total of 363 responses were received, out of which 43 were discarded due to incomplete information. The final sample comprised 320 responses. As per the recommendations of scholars, a minimum sample size of 300 was suitable for structural equation modelling (Kline, 2023; Yu et al., 2023).

3.3. Data Collection

Questionnaires have been widely used as a research instrument in investigating perspectives of students, as evident in previous studies (Bordoloi et al., 2021; Sari & Wahyudin, 2019; Zheng et al., 2021). Data collection for this study also involved a self-administered online questionnaire distributed among geographically dispersed students. The choice of a cross-sectional online questionnaire was well-suited to the study's scope, considering the need for completion within a limited timeframe and resources. Students were informed about the research purposes and objectives prior to administering the survey. The questionnaire, comprised of closed-ended questions, designed using a Likert-type scale, provided insights into the frequency, usage, and experience of students of digital media as a learning tool. Participants' involvement in the study was voluntary, and the researcher took measures to guarantee their willingness to participate. Furthermore, the researcher provided assurance to the participants that all information collected would be strictly used for research purposes and that their personal data would be treated with confidentiality.

3.4. Research Instrument

The research instrument utilized in this study was divided into two sections. The first section gathered demographic data from the respondents, while the second section comprised questions aimed at assessing the constructs included in the proposed theoretical model. The responses of the participants were rated on a Likert scale, ranging from 5 ("Strongly Agree") to 1 ("Strongly Disagree"). In order to ensure the reliability and content validity of the scales in the questionnaire, prior literature was utilized, and scales were adopted from well-established questionnaires and adjusted as per the context of the study, namely:

1) For the construct, students' experience of using social media in learning, a total of 11 items were utilized to measure students' experience of using social media in learning from Noori et al. (2022).
2) To operationalize the construct, students' experience of the usage of social media in teaching, five items were adapted from Noori et al. (2022).
3) For the construct, students' experience of frequency of learning using social media, ten items were adopted from the work of Noori et al. (2022).
4) For the variable, collaborative education, four items were used to measure collaborative education by Tkacová et al. (2022).
5) To assess the variable, technological skills, a set of four items was adapted from Tkacová et al. (2022).
6) To measure the mediating variable, motivation for learning, four items were adapted from a study by Hung et al. (2010).

In the end, the adapted version of the questionnaire was reviewed and discussed by two academic professors specializing in the field of education, who unanimously affirmed its validity. This process further ascertained the face and content validity of the questionnaire.

3.5. Data Analysis

The current research's investigative framework was assessed using SPSS software to conduct preliminary statistical analyses. In the initial analysis, the researcher employed descriptive statistics, reliability tests, and sample adequacy testing. Furthermore, a multivariate two-step technique was implemented, following the methodology proposed by scholars (Hair et al., 2010). For the two-step procedure, AMOS software was utilized, enabling the application of structural equation modelling (SEM) (Collier, 2020). SEM is a statistical technique employed to establish, estimate, and assess causal relationships. Unlike conventional regression

analysis, SEM is capable of handling multiple dependent variables simultaneously, as well as independent latent variables. The initial step involved establishing the measurement model, while the subsequent phase focused on the structural model. In the first phase of analysis, the researcher employed confirmatory factor analysis (CFA). This technique was crucial in assessing the reliability of the model. In the second part of the analysis, the formulated hypotheses in the study underwent evaluation.

4. Results

4.1. Respondents' Demographic Profile

Data were obtained from university students in China, and the evaluation of the demographic profile of respondents is displayed in Table 1. Out of 320 respondents, 172 (53.8%) were male, and 148 (46.2%) were female, indicating fair representation of both genders. Regarding age, 165(51.6%) of the respondents were between the ages of 18 to 21 years, whereas 155 (48.4%) belonged to the second age group of 22 to 25 years.

Table 1: Demographic Profile of Respondents.

	Frequency	Percent
Gender		
Male	172	53.8
Female	148	46.2
Total	320	100.0
Age		
18-21 years	165	51.6
22-25 years	155	48.4
Total	320	100.0

Additionally, as the study was based on evaluating learning using social media, respondents were asked about their social media usage for educational purposes, as shown in Table 2. A total of 233 (72.8%) stated that they utilized social media for education, while 87 (27.2%) stated otherwise.

Table 2: Social Media Usage for Education.

	Frequency	Percent
Yes	233	72.8
No	87	27.2
Total	320	100.0

4.2. Descriptive Results

For each construct, descriptive statistics were calculated and presented in Table 3. The mean values of items were positioned above the midpoint, spanning from 3.20 to 3.39. Regarding skewness, no asymmetrical distribution was observed, as the range considered acceptable for confirming symmetrical distribution lay between -2 and +2 (Byrne, 2013).

Table 3: Descriptive Statistics.

	N	Min	Max	Mean	SD	Skewness	
						Statistic	Std. Error
SML	320	1.00	5.00	3.2036	1.06935	-.315	.136
SMF	320	1.00	5.00	3.2670	1.22680	-.223	.136
SMT	320	1.00	5.00	3.2125	1.25437	-.160	.136
MOT	320	1.00	5.00	3.3937	1.06473	-.250	.136
CE	320	1.00	5.00	3.2650	1.20366	-.149	.136
TS	320	1.00	5.00	3.2870	1.10006	-.312	.136
Valid N (listwise)	320						

Note: SML= Students' experiences of using social media in learning, SMF= Students' experiences of the frequency of using social media in teaching and learning, SMT= Students' experiences of the usage of social media in teaching, MOT= Motivation, CE= Collaborative education, TS= Technological Skills"

4.3. Reliability Test and Factor Analysis

The Kaiser-Meyer-Olkin value of 0.950 in this study demonstrates the data's suitability for factor analysis (Sabah, 2020). Moreover, Bartlett's test examines the equality of variances among groups. The results in Table 4 reveal a p-value below 0.05, confirming the data's appropriateness for further factorial analysis (Pallant, 2020).

Table 4: KMO and Bartlett's Test.		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.950
Bartlett's Test of Sphericity	Approx. Chi-Square	16274.541
	Df	465
	Sig.	.000

Furthermore, the factor analysis demonstrated satisfactory factor loading at a level of 0.4, adhering to acceptability criteria (Chan & Idris, 2017). Table 5 exhibits the absence of cross-loadings.

Table 5: Rotated Component Matrix.						
	Component					
	1	2	3	4	5	6
SML1		.792				
SML2		.766				
SML3		.729				
SML4		.708				
SML5		.691				
SML6		.824				
SML7		.821				
SMF1	.855					
SMF2	.866					
SMF3	.873					
SMF4	.864					
SMF5	.870					
SMF6	.865					
SMF7	.866					
SMF8	.872					
SMT1					.695	
SMT2					.741	
SMT3					.732	
SMT4					.700	
MOT1				.819		
MOT2				.810		
MOT3				.799		
MOT4				.809		
CE1			.917			
CE2			.913			
CE3			.907			
CE4			.902			
TS1						.929
TS2						.855
TS3						.866
TS4						.799

Note: SML= Students' experiences of using social media in learning, SMF= Students' experiences of the frequency of using social media in teaching and learning, SMT= Students' experiences of the usage of social media in teaching, MOT= Motivation, CE= Collaborative education, TS= Technological Skills"

4.4. Confirmatory Factor Analysis

Both convergent and discriminant validity were assessed. All constructs, except technological skills, displayed CR values above the suggested level of 0.7, adhering to guidelines established by scholars (Hair et al., 2021a, 2021b). Similarly, AVE values were assessed using the threshold of > 0.5. AVE values for all variables, except MOT, were greater than 0.5. While the MOT scale demonstrated poor convergent validity, the convergent validity score only slightly deviated from the desired threshold of .50, and the factor loadings were within the acceptable criteria. AVE scores must be greater than the MSV values to establish discriminant validity. Table 6 shows that AVE values are greater than MSV values for all constructs except collaborative education and technological skills, indicating discriminant validity concerns.

Table 6: Discriminant and Convergent Validity.

	CR	AVE	MSV	MaxR(H)	SMF	SML	CE	MOT	SMT	TS
SMF	0.996	0.970	0.598	0.998	**0.985**					
SML	0.951	0.734	0.601	0.971	0.761***	**0.857**				
CE	0.949	0.824	1.009	0.951	0.258***	0.349***	**0.908**			
MOT	0.899	0.689	0.303	0.900	0.550***	0.469***	0.269***	**0.830**		
SMT	0.961	0.861	0.601	0.962	0.773***	0.775***	0.242***	0.443***	**0.928**	
TS	0.426	0.307	1.009	0.875	0.274***	0.371***	1.005***	0.295***	0.271***	**0.554**

Therefore, the discriminant validity was assessed using the heterotrait-monotrait (HTMT) method. In contrast to the Fornell and Larcker criterion, the HTMT method is regarded as a more stringent and credible approach in structural modelling methodologies (Henseler et al., 2015). The results presented in Table 7 indicate that the values between latent constructs remain below 0.850 for all variables. This confirms the absence of high correlation among the constructs, and discriminant validity was achieved.

Table 7: HTMT Method.

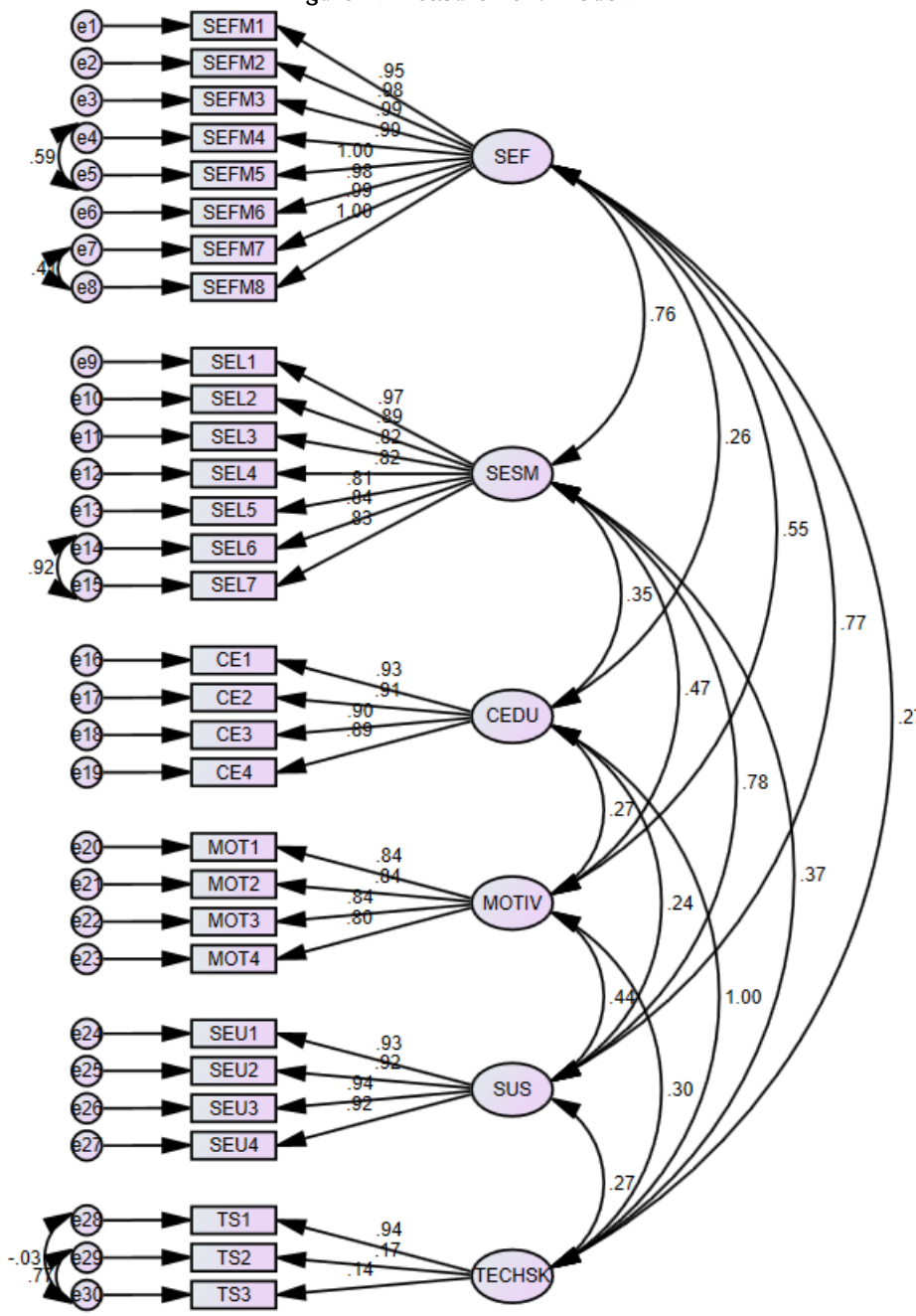
	SML	SMF	CE	MOT	SMT	TS
SML						
SMF	0.753					
CE	0.256	0.360				
MOT	0.547	0.473	0.269			
SMT	0.774	0.774	0.243	0.443		
TS	0.550	0.541	0.683	0.624	0.499	

The CFA was also utilized to evaluate the model's adequacy. The outcomes displayed in Table 8 validate the model's precision and suitability, as evidenced by observed values. Hence, the values in Table 8 and the measurement model in Figure 2 support the fulfilment of all the criteria, leading to the outcome that the model is reliable and appropriate.

Table 8: Confirmatory Factor Analysis.

CFA Indicators	CMIN/DF	GFI	IFI	CFI	RMSEA
Threshold Value	≤ 3	≥ 0.80	≥ 0.90	≥ 0.90	≤ 0.08
Observed Value	1.656	0.881	0.984	0.984	0.045

Figure 2: Measurement Model.



4.5. Structural Equation Modelling (SEM)

SEM assesses the interconnections between latent and observable variables (Byrne, 2013). The direct and indirect impacts of the proposed model are presented in Table 9 and Table 10 respectively and in Figure 3. The results indicate that SML has a positive influence on CE with β= 0.35. The p-value of 0.04 validates the significance of the association at a 1% significance level, thereby supporting the first hypothesis. As opposed to the hypotheses proposed, SMT and SMF were negatively associated with CE, indicating a decline in collaborative learning. Therefore, with p-values greater than 0.05, H_2 and H_3 hypotheses were not supported. Secondly, the researcher evaluated the impact of the independent

variables on technological skills. No significant association was found between SML and TS. Similarly, SMT was not significantly associated with TS, with a p-value of 0.348. However, H_6 was supported as SMF positively and significantly impacted the TS of students in Chinese universities.

Table 9: Direct Path Analysis.				
Direct Path	Estimate	Lower	Upper	P-Value
SML → CE	.350	.211	.563	.004
SMT → CE	-.051	-.199	.154	.640
SMF → CE	-.039	-.211	.121	.703
SML → TS	.015	-.127	.135	.953
SMT → TS	.100	-.060	.221	.348
SMF → TS	.176	.022	.329	.024

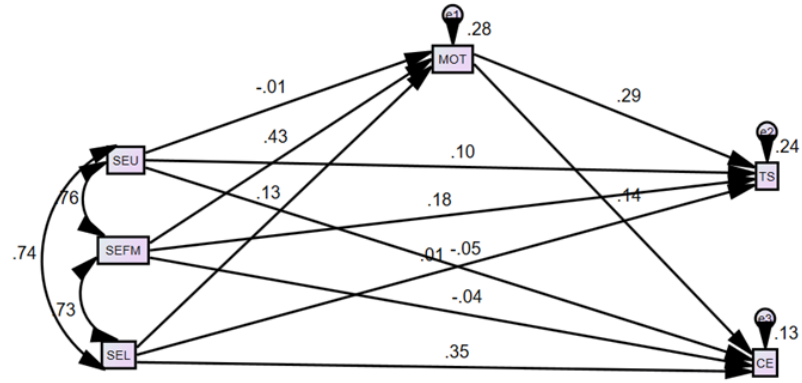
Note: SML= Students' experiences of using social media in learning, SMF= Students' experiences of the frequency of using social media in teaching and learning, SMT= Students' experiences of the usage of social media in teaching, CE= Collaborative education, TS= Technological Skills"

The study incorporated the mediating role of learner motivation as per the SCT. Table 10 reveals that MOT significantly mediated the association between SML and CE at a low level of significance, lending support to H_7. However, MOT was found to be an insignificant mediator in the association between SMT and CE, with a p-value of 0.796. With a p-value of 0.02, MOT significantly mediated the association between SMF and CE at a 5% significance level, and therefore, H_9 was accepted. In terms of the association between SML and TS, as presumed in H_{10}, no significant mediating role of MOT was observed. Similarly, with a p-value of 0.837, H_{11} was not supported as MOT insignificantly mediated the association between SMT and TS. Lastly, MOT significantly mediated the relationship between SMF and TS at a high level of significance, resulting in the acceptance of H_{12}.

Table 10: Indirect Path Analysis.					
Indirect Path	Unstandardized Estimate	Lower	Upper	P-Value	Standardized Estimate
SML --> MOT --> CE	0.020	0.001	0.057	0.089	0.018
SMT --> MOT --> CE	-0.001	-0.024	0.016	0.796	-0.001
SMF --> MOT --> CE	0.060	0.017	0.116	0.020	0.061*
SML --> MOT --> TS	0.038	-0.001	0.093	0.111	0.037
SMT --> MOT --> TS	-0.003	-0.044	0.028	0.837	-0.003
SMF --> MOT --> TS	0.112	0.062	0.182	0.000	0.125***

Significance of Estimates: ***p<0.001, **p<0.010, *p<0.050, ŧp<0.100
Note: SML= Students' experiences of using social media in learning, SMF= Students' experiences of the frequency of using social media in teaching and learning, SMT= Students' experiences of the usage of social media in teaching, CE= Collaborative education, TS= Technological Skills"

Figure 3: Structural Equation Modelling.



5. Discussion

The 21st century brought significant changes in the learning and teaching environment and ways. The multiple uses of social media provide enormous opportunities for individuals to learn skills and educate themselves. Besides entertainment, it also proved an effective education and learning medium, especially regarding high-quality skills learning and awareness. The present study analyzed students' experience using social media in learning and teaching. The researcher also examined the impact of learning frequency on collaborative education and technological skills. The mediating role of learning motivation was also studied.

The results of the direct association indicate a significant relationship between motivation for learning and collaborative education and technical skills. The findings imply that students' orientation, aptitude, and motivation toward learning significantly impact their technical skills and collaborative education. The results align with the previous, as Hosen et al. (2021) identified a strong relationship between social media use, technological orientation, and individual learning. It is confirmed that the students find social media learning more exciting and effective. The higher cases of maximum motivation in social media learning impact their technological skills. It is also confirmed by Akgündüz and Akınoğlu (2017) that social media-supported learning are directly associated with the student's perception of social media and their attitude towards this type of learning.

The results also confirmed the relationship between the frequency of learning social media and technological skills. The students who were more eager for learning opportunities and consume maximum knowledge were more likeable to have improved technological skills as the use of social media itself opens multiple rooms of opportunities to learn these skills by putting your attention in the right direction. These results are justified by the previous studies as well. The findings of Stopar and Bartol (2019) indicate that digital competency and computer skills enhance learning frequency, impacting their technological skills. Biswas et al. (2020) identified that the frequency of using social media cannot determine the learning outcomes. It is necessary to consider the factors, i.e., learning frequency, competence, and knowledge consumption which impact technological skills. According to the results, the student's experience using social media in learning is positively associated with collaborative education.

As collaborative learning is effective in teaching technological skills, interaction and learning through social media improve collaborative education, which resultantly improves learning outcomes. The previous studies support these results, as Ansari and Khan (2020) highlighted the usefulness of social media in interaction and collaborative learning. It has occurred that interaction through such platforms positively impacts knowledge-sharing behaviour. Van Den Beemt et al. (2020) also confirmed that social media enhances active engagement, resulting in improved learning outcomes.

The results of the indirect hypothesis indicate a significant mediating role of learning motivation between students' frequency of learning social media and technological skills and collaborative education. The previous literature justifies the results. Collaborative education is thus facilitated by learning motivation. Regarding technological skills, learning through social media facilitates teaching technological skills (Sari & Wahyudin, 2019). Due to the encouraging perception towards the social media learning campaigns and the deviation from the alternative means of learning, the motivation and perception of students regarding learning and teaching method are also changed. Active engagement, interest, and motivation in learning through social media are positively associated with technological skills learning and collaborative education at one hand. On the other, it is significantly related to the frequency of learning. The learning motivation thus establishes a strong relation between the two factors.

6. Conclusion

E-learning trends nowadays have altered the traditional conception of learning and teaching technological skills. The youth are more inclined to social platforms to acquire knowledge and skills. Social media, therefore, becomes a potential medium for teaching and learning. With the growing digital literacy and social media aptitude in China, collaborative education is becoming easy. Social media campaigns for this purpose have proven effective in yielding better learning outcomes than traditional learning. Due to these trends in China, the researcher aimed to examine the association between social media usage and technological skills and collaborative learning. The quantitative research method is adopted to analyze the relationship. According to the results, MOT is significantly associated with TS and CE. SMF is found significant in association with the TS. The direct impact of SML is also found to be significant with the CE. The results of the indirect

relationship indicate the significant mediating role of MOT between SMF and TS. The mediating role of MOT is also found significant in the relationship between SMF and CE. The findings proved that learning motivation is important in learning and teaching technological skills through social media. The in-depth analysis of the relationship between factors confirmed that social media campaigns and online learning are proven effective in engaging students and equipping them with efficient technological skills. It is also proven that learning motivation remains high on social media platforms and therefore facilitates collaborative education.

The researcher considered the role of social media in enhancing skill-based learning. As the traditional mediums proved inadequate in providing effective skills, social media emerged as one of the strongest mediums of learning, which changed the education dynamics. The present study explored multiple learning factors associated with social media use. The researcher has discussed the student's learning experience and the frequency of using social media for this purpose. The study contributes to the current research stream on the selected issues based on their in-depth findings. The researcher contributed to the previous information on the research forum by justifying the hypothesis with empirical evidence.

By analyzing the relationship between digital media usage and skill promotion, this study contributes valuable insights to educational policymakers, institutions, and educators in China. It will assist the education management authorities in understanding the role of social media in boosting learning courage and encouraging them to learn from social media instead of consuming it purposelessly. Moreover, the study can be valuable for teachers and mentors using such platforms to teach skills. It will enable them to understand the impact and influence they have on the student's creativity, learning, and skills. For the students, it is necessary to take the learning responsibly and equip themselves with the skills that can be beneficial in the future. Moreover, the study develops a strong base for policy-making regarding content creation on different social media platforms and social campaigns to develop skills and potential in the youth through social media.

The study had certain limitations that pave the way for future researchers to cover these gaps by expanding the research in the right direction. The study covered the issues in the context of China. The use of social media is widely observed in the whole Asian and European region. Analyzing these factors in this context does not allow the researcher to generalize the findings to any other country's context. The education system, policies, and aptitude vary in each region. Therefore, future research should expand this research topic and investigate the research problem in different country contexts. A comparison on an international level or between China and other Asian countries can be made to get a broader insight into the issue.

Moreover, the research choices in this study limit the scope of the findings. The researcher adopted a quantitative research method and analyzed the data through AMOS. To get a subjective perspective on this issue from the relevant figures, i.e., students, social media mentors can be interviewed through qualitative research. Investigating the research problem this way can also widen the scope of the research study. Different methodological options can be opted for by future researchers to get diverse perspectives. The choice of the variables is also limited. Besides the selected factors, the aptitude and perception of students towards social media learning, media literacy, the quality of content on social media, and the teaching orientation of mentors can be discussed in association with social media learning and teaching.

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