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The Role of Digital Literacy in Mitigating the Effects of Social Media Usage on Academic Performance: A Study of TikTok Users in Higher Education Institutions in China

Jiaqi Liu[1], Hamedi Mohd Adnan[1], Nur Izzati Binti Aziz[1]

[1]Faculty of Arts and social sciences, Universiti Malaya, Kuala Lumpur, Malaysia

Correspondence: Jiaqi Liu, Faculty of Arts and social sciences, Universiti Malaya, Kuala Lumpur, Malaysia.

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Abstract

Digital literacy improvement is considered supportive to optimize the use of social media platforms in a positive way. The influence of platforms such as TikTok is considered significant for influencing the academic performance level of a student pursuing his/her higher education. However, lack of proper knowledge about digital literacy improvement is still affecting the academic performance of the users in China. Relevant questions and objectives are developed to reach the purpose of the research study. The integration of the "Uses and Gratification Theory" further helps in exploring the interrelationship between the variables selected in the study that is followed by formation of the hypotheses. A detailed analysis of existing literature has facilitated the identification of the gap that shows lack of research on potential effects of TikTok on academic outcomes. Primary data collection has been used in this study for conducting the survey process among 410 students from the institutions of China. The quantitative data analysis has been used for examining the collected information through IBM SPSS. The results highlight that all the variables selected for the research have a significant impact on the Academic Performance of the students in higher education institutions in China apart from frequency of usage. Its direct impact on Academic Performance has not been established by the findings from the analysis. The study helps in identifying the need for more extensive research or doing qualitative data based research for exploring more ideas about the factors associated with digital literacy improvement by practical strategies.

Keywords: educational materials, social media addiction, procrastination, negative gratifications

1. Introduction

1.1 Introduce the Problem

Digital literacy refers to the appropriate use of digital devices, which facilitates the acquisition of necessary knowledge and ideas for meaningful action (Peng et al., 2022). Due to the growth of online learning and the increasing popularity of social media for various purposes, the advancement of digital literacy is crucial and should be supported. Digital media such as TikTok are inherently learner-centered and have been found to impact learners' speaking and writing skills (F. Jimola, 2023). When higher education students use these platforms, improving digital literacy can increase their learning-focused time. However, certain influencing factors can positively influence digital literacy, but these factors have been limited in their exploration or application. The need for more training to enhance digital competence or literacy and to incorporate more relevant training to improve digital competency skills has been recognized (Li et al., 2024). Research has also found that there is insufficient understanding of the tools or methods available to enhance digital literacy among students in higher education institutions. Therefore, further research is needed to investigate the role of digital literacy in improving social media use and academic achievement. This study aims to explore the role of digital literacy in controlling the impact of social media use on the academic achievement of TikTok users in Chinese universities, hoping to provide a meaningful reference for the cognition and improvement of digital literacy.

Research on the impact of digital literacy has primarily focused on TikTok users pursuing degrees at higher education institutions. Therefore, prioritizing or considering student perspectives should be prioritized to determine student perceptions of TikTok use. This study focused on TikTok users in China; therefore, it does not consider social media use among students in other regions. Considering its theoretical and practical implications is important, as the findings can help educational institutions strengthen relevant practices or policies to improve digital literacy in all settings.

Furthermore, learners will gain essential insights into digital literacy concepts, which can positively impact their use of social media platforms like TikTok.

1.2 Research Objectives

RO1: To evaluate the influence of frequency of usage on academic performance of TikTok users in higher education institutions in China

RO2: To analyse the impact of student engagement on academic performance of TikTok users in higher education institutions in China

RO3: To investigate the influence of perceived usefulness on academic performance of TikTok users in higher education institutions in China

RO4: To analyse the role of self-expression in terms of influencing academic performance of TikTok users in higher education institutions in China

RO5: To investigate the mediating impact of escapism on the relationship between frequency of usage, student engagement, perceived usefulness, self-expression and academic performance

1.3 Research Questions

RQ1: What is the impact of frequency of usage on academic performance of TikTok users in higher education institutions in China?

RQ2: What is the influence of student engagement on academic performance of TikTok users in higher education institutions in China?

RQ3: What is the influence of perceived usefulness on academic performance of TikTok users in higher education institutions in China?

RQ4: What is the significance of self-expression in terms of influencing academic performance of TikTok users in higher education institutions in China?

RQ5: What is the mediating impact of escapism on the relationship between frequency of usage, student engagement, perceived usefulness, self-expression and academic performance?

1.4 Relevant Scholarship

Uses and Gratification Theory, The uses and gratification theory is a communication framework that examines why individuals actively seek out specific media content to satisfy their needs and desires(Kujur & Singh, 2020). It was proposed by Elihu Katz and Jay Blumler and is significant in shifting the focus from the effects of media on passive audiences to understanding users as active participants in media consumption. The theory posits that people use media to fulfil specific psychological and social needs, such as information, personal identity, social interaction, or entertainment(Rrustemi et al., 2021). The theory is pertinent in recognising diverse motivations and outcomes, allowing for a nuanced understanding of media use. This framework holds significance in deciphering the effects of media on people and illustrates how media is used by people to derive satisfaction.

In the context of the research, the inclusion of the uses and gratification theory helps in deciphering the intentions of the students for using TikTok whether entertainment, social connection, relaxation, or seeking information(Du et al., 2023). These factors can significantly drive the intentions of the students in engaging with the platform influencing the span of time spent on the platform as well as its potential impact on academic performance. In addition to this, the framework can be significant in terms of illustrating the concept of digital literacy, which involves the ability to critically evaluate and effectively use digital platforms wherein a detailed notion of how students actively use TikTok can help clarify the relationship between digital literacy and the management of academic priorities(Vaagan, 2022).

In addition to this, the integration of the uses and gratification theory is further integral in highlighting the diversity of motivations for TikTok use(Ahlse et al., 2020). Understanding these motivations can guide the development of targeted digital literacy programs that in turn might impart a positive influence on their technological competence as well as academic performance through the development of their ability to identify credible sources. The objectives of the framework are significant in exploring the specific gratifications that correlate with positive or negative academic outcomes. In this regard, while the framework emphasises the acquisition of new skills, or networking with peers which might support academic growth yet at the same time highlight the negative gratifications related to procrastination, entertainment, or avoidance of academic stress that might hinder academic performance. Furthermore, insights gained from the uses and gratification theory can inform higher education policies by identifying patterns in students' media use which can benefit the institutions in integrating digital literacy training tailored to social media usage enabling students to align media use with their academic and personal development goals.

Academic performance means, students' performance in education activities geared towards the achievement of educational objectives and outcomes including grades, knowledge gained and learnt skills (Quílez et al., 2023). This paper also embraces the theory to understand how TikTok consumers in higher education seek the app to cater for their needs such as entertainment or learning purposes. It is a part in the assessment of the role it plays in the academic performance of students, to determine whether or not they use TikTok to study or as an interruption. E-Safety allows students to be the recipients of proper guidance regarding their choices and make positive choices so that they use social media platforms to foster learning instead of diminishing one's performance.

Frequency of usage concerns the degree up to which higher education students use the TikTok platform (O'Day & Heimberg, 2021). The theory brings clarity to understand why students often use TikTok, concentrating on their needs such as entertainment, communication or educational purposes. These latter motives assist in the analysis of use patterns given the awareness of their existence. In the case of TikTok, student digital literacy helps students to find the wanted content and manage their time on the site so it doesn't become a net loss to their performance.

Student engagement: Students' learning involvement is a measure of the manner in which the learners approach their classroom exercises (Salas et al., 2022). It elucidates how students use TikTok depending on the task at hand to get education, social interaction or to calm down. This theory I believe can be used to understand how TikTok's features grab students Attention and how they manipulate the level of engagement. Digital literacy also has a predominant role because it enables students to make a significant distinction and shifts their emphasis from non-educational content uses. When students have used TikTok responsibly to enhance their academic endeavours, then the social app can enhance learning instead of retarding it.

Perceived usefulness: Perceived ease of use is the extent to which the students believe that using TikTok will be beneficial for academic or personal progress respectively (Eryc, 2022). The theory deals with the manner in which students consider TikTok useful depending on their wants, needs, wants or a combination of both. From this rather unassailable position, if students are using TikTok for substances, they are likely to perceive it as beneficial for that purpose. This perception is improved by digital literacy since it helps the students to recognize and apply various forms of educational materials. Once the students embrace understanding the manner in which TikTok is useful in their learning needs, they will be able to refine the site to be more productive instead of engaging in it causing more distractions.

Self-expression: TikTok eases self-expression in the way that the students relate their ideas, inner and creativity to the social app (Wang et al., 2023). The idea of how TikTok organizes students' demand for self- expression through producing and posting content. This allows the students free self-expression or creativity, opinion or experience among other things hence the appeal of the platform. Technology proficiency is crucial to guaranteeing that learners are keen when it comes to the use of TikTok parsing in a way that will suit personal as well as academic goals. Creating meaningful self- exploration will help students be creative with their work while minimizing the effects of social media on their studies so as not to affect their study time.

Escapism, Impulsiveness is about students' ability to run away from something through using TikTok or pressure they are experiencing in school or back at home(ZHANG & Vilma, 2023). The theory of Uses and Gratification in social media states that the use of TikTok helps students to break free from studying and get away from stressing thoughts. This theory will justify why students use the platform to have fun and be occupied. Short-term it can be the best way to escape problems, nonetheless, frequent use negatively impacts academic results. Another is Digital literacy enables the students to understand this behavior and avoid excessive use of TikTok. In this way, through the presented means the student can receive all the enjoyable factors of this phenomenon without disrupting his academic pursuits.

Literature gap: Much of the existing literature primarily addresses social media in general, with limited exploration of the specific relationship between TikTok as a platform and its impact on education or academic performance. Despite TikTok's widespread popularity, there is a noticeable lack of research on its potential effects on academic outcomes, particularly within higher education institutions in China. Furthermore, the platform's emphasis on short, engaging content may influence students differently than other social media platforms, a distinction that remains underexplored. Additionally, most studies tend to treat digital literacy as a concept inherently linked to online education, overlooking its broader significance outside of this context. This results in a considerable gap in the literature.

1.5 Research Hypothesis

DV: The dependent variable "Academic Performance" is influenced by digital literacy and proper monitoring is needed in terms of improving it (Yustika G & Iswati S, 2020).

IV: Frequency of usage: It can be considered as the time or under use of using digital devices or interaction with such devices that can impact abilities of an individual (Shatskaya st al., 2023).

Student Engagement: It can stated based on the variable, student engagement towards the digital devices is often influenced through the learning environment provided to them (Nkomo et al., 2021).

Perceived Usefulness: It is considered as the perception on the ability of the digital device that are used for academic purposes (Ortiz-López et al., 2024).

Self-expression: It can be referred to in the study as the way through which expression or thought of a student can be expressed through the help of digital mediums (Codetoday, 2023).

MV: "Escapism" can be considered as an escape from the real-life situation (such as studying) and engaging in entertainment, especially while the digital device is used (Kloppers, 2025).

It is evident that intensive use of social media has a significant impact on academic performance especially among students in higher education. Studies have shown that frequent usage of TikTok may influence the study outcome since it has both positive and negative impact ((Febrianti et al., 2022), The result of a study has discovered that academic performance had a major effect by TikTok, and most students said that the app enhanced their learning results and that they were happy using it for educational purposes (Iglesias et al., 2021). Unquestionably, educational strategies are crucial for encouraging students to use technology for learning and for assisting them in developing self-control over their use of it (Jiang et al., 2022). In this context, a research has demonstrated that personal time management abilities may also influence how TikTok affects academic achievement. Pupils who are able to strike a balance between their extracurricular and academic obligations might not suffer, while those who find it difficult may do worse (Yafie et al., 2025). Subsequently, research on how social media affects academic achievement has revealed conflicting findings. While some research suggests that there is no substantial association, others show that excessive usage of social media might result in shorter periods of concentration and poor results (Kolhar et al., 2021). Hence, it can be hypothesised that:

H1: Frequency of usage has a significant impact on academic performance

The basis of student achievement and academic achievement is student involvement, which involves a number of factors that people should be aware of(Amerstorfer & Von Münster-Kistner, 2021). According to study, students who actively participate in their studies are better able to comprehend and remember material as well as relate lessons learnt to real-world circumstances. Additionally, engagement fosters a pleasant learning atmosphere and raises curiosity, teamwork, and a passion for learning(YouScience, 2024). The findings of a study showed that academic success was significantly impacted by TikTok. Additionally, the students responded well to the usage of TikTok, with 84% of them finding it simpler to comprehend the course topics and 80% feeling more motivated to study them(Salasac & Lobo, 2022). Irrespective of the format teachers choose to create their classes and learners are more inclined to interact with the material if it is presented through all of their preferred multimedia formats(Vallis et al., 2023). Similarly, other studies have shown that students are more likely to participate enthusiastically in the learning process when they perceive that their instructor and other students value and support them. As they do this, they become more competent, self-assured, and confident, which increases student engagement and endurance while dealing with challenging material(Hollister et al., 2022). Hence, it can be stated that:

H2: Student engagement has a significant impact on academic performance

According to research, investigators have stated that users must be happy with the services they get and expect to gain from consumption-based products in their everyday lives. Whether or not a technical gadget is beneficial determines the expectations surrounding its use(Toros et al., 2024). The link between such constructs, which together influence how technology is accepted and used, serves as the foundation for the justification for using perceived usefulness to forecast PEOU. Users believe that an app is easy to use because they believe it will benefit them, that it will take little training to master, and that they may employ it effortlessly(Muñoz-Carril et al., 2021). Prior research has demonstrated that perceived usefulness significantly improves pleasure and the perceived influence on learning. Perceived usefulness along with mind-set are positively correlated, according to several research on the implementation of technology in education(Lamimi et al., 2024). Research findings have demonstrated that group collaboration has increased the effectiveness of learning about topics discussed in the course. According to some investigators, the TikTok platform has the capacity to be academically valuable since it significantly enhances kids' physical science abilities and inventiveness(Rahimullah et al., 2022). Thus, the following hypothesis is put forth by this study:

H3: Perceived usefulness has a significant impact on academic performance

It has been established by (Liang, 2023) that as much as TikTok has more than 600 million daily active users where 85% of users are under the age of 24 accounting for approximately 26 million college students. Simultaneously, (Gao, 2023) has emphasised that the platform imparts a positive impact on the users and as per statistics 44.3% of young people learn new knowledge on Douyin which is one of the biggest reasons for engagement with the platform. In the opinions

of(Zhu et al., 2024), the symbolic interaction and self-perception that the platforms offer have a tremendous influence on the younger demography which changes their own perceptions, emotions and self-expression. The ability to express themselves, adapt, and have self-efficacy play an important role in the academic success of students. In this regard(Yusefi et al., 2024), has opined that students who demonstrate a higher level of self-expression and a greater ability to communicate effectively tend to make better academic progress. However, it is not necessarily devoid of negative implications where students deeply engaged in self-expression on TikTok may spend excessive time on the platform, leading to reduced study hours or procrastination. Additionally, the gratification from likes, views, or comments might shift priorities away from studies, leading to academic underperformance (School, 2023).

H4: Self-expression has a significant impact on academic performance

In the report published by the "China Internet Network Information Center (2023)" it could be identified that the majority of the students in China use TikTok for entertainment purposes where the duration of engagement is roughly more than 2 hours daily(Liu & Li, 2024). While exploring the motivations for the usage of TikTok, (Zhang, 2022) has identified that excessive involvement with TikTok is attributable to social anxiety, loneliness, and happiness wherein loneliness partly leads to escapism, and through escapism leads to TikTok addiction. Additionally, (Dong & Xie, 2024) has highlighted that in addition to escapism, the prolonged use of TikTok among students can also be attributed to relieving stress, passing time, seeking fame, and other factors. TikTok's algorithm tailors content to the viewer's preferences, often promoting emotionally engaging or humorous videos. For frequent users, this reinforces a cycle of emotional disengagement, where they turn to the app to cope with feelings of anxiety, loneliness, or stress, instead of addressing these issues directly(Ramsden & Talbot, 2024). Furthermore, (Bujph, 2021) has stated that TikTok's rapid delivery of content with high emotional or intellectual appeal can trigger dopamine releases, creating a reward loop. Therefore, it can be ascertained that escaping into TikTok can provide temporary relief from academic pressures, wherein frequent use may prevent users from addressing underlying issues, leading to longer-term consequences such as poor time management, procrastination, or poor academic performance.

H5: Frequency of usage has a significant impact on escapism

The term "intensity of social media use" describes how involved people are with social media, especially how much time they spend on it, how many friends they have online, and how often they use it(Yang et al., 2022). On TikTok, a lot of college students regularly participate in intense interpersonal relationships by responding on other users' posts and sharing updates from their own lives. Their sense of belonging, companionship, and connection may all be influenced by the online interaction(Brailovskaia et al., 2020). While some studies characterised escapism as a behaviour used to divert one's attention from real-life issues, others defined it as the use of the online world to avoid focusing on real-life issues(Swart, 2021) (Ramsden & Talbot, 2024b). Escapism was thought to be one of the driving forces for compulsive social media use. According to research, using social media in an unhealthy way as an escape may be a major contributing factor to social media addiction. Social media is a preferred method of communication and learning for college students(Luchtefeld & Jordan, 2022). Additionally, when users plan to use TikTok as an escape, their frequency of use will rise. Yet, experts have looked at social media addiction, but they have not delved into TikTok usage in general. This highlights missing information in the literature and restricts the interpretations that can be made about dependency and escapism in TikTok usage(Timotheou et al., 2022). The following hypothesis has its foundation on the research review mentioned above:

H6: Student engagement has a significant impact on escapism

The perceived usefulness to which TikTok users can believe in a platform and provide their personal experiences on them addressing their needs is a very crucial aspect of studying. In higher education, students often visualise the content on social media platforms like TikTok for escaping their academic pressures(Sharabati et al., 2022). The perceived usefulness of the social media platform can become a source of distraction for the students which can significantly impact stress among the students as a form of escapism. It is also evidently seen that the students who perceive TikTok as a useful tool for entertainment or stress relief are better able to engage in it for escaping particularly in situations of high-pressure academic periods. For many students TikTok's short and engaging videos work out as a mental distraction from academic tasks. The perceived usefulness of TikTok engaging features like personalised content or algorithm driven recommendations for the users helps in deeper engagement with the platform. This further escalates the engagement of the users with the social media platform and helps them to have greater mental detachment from academic pressures and responsibilities(Wang & Oh, 2023). The following hypothesis has been developed for the understanding of the above-mentioned relationship between perceived usefulness and escapism:

H7: Perceived usefulness has a significant impact on escapism

Self-expression is generally referred to the ability of a person to share their thoughts, creativity, and emotions through different social media platforms like TikTok. This aspect about the social media platforms like TikTok helps the

students to use the platform like a mediator for escaping and sharing their narratives(Dias & Duarte, 2022). Higher education students generally are found to be using TikTok for escapism and exploring and expressing different aspects about their identity, which may not be visible in their academic or social lives. A student's ability of creating and sharing original content on social media platforms like dance, humour or storytelling helps students to channel their creativity better. This provides a valuable escape to the students to reduce their stress of academic lives. Along with this, sharing personal experience aspects about TikTok and more also helps the students to use the platform as an outlet for their feelings(Sharabati et al., 2022). With the expression on the different videos, students are available to relieve their academic and personal challenges with engagement in escapism. All of this enables the development of the following hypothesis here:

H8: Self-expression has a significant impact on escapism

Escapism is the act of seeking relief from reality with the help of activities such as TikTok. Higher education students often are found to use escapism to avoid academic stress or challenges which can directly impact their academic performances. It is often advisable to take healthy escape routes for the students which can help them to recharge and return to their studies better (Di Pomponio & Cerniglia, 2024). The positive impact of escapism on academic performance also depends on the frequency of escapist behaviour. More than needed use of TikTok for escapism can also lead to procrastination which delays the academic tasks for the students. Along with this, it is also known for allowing the students to step away from any form of academic demands that are overwhelming for them and reduce the overall cognitive overload(Miranda et al., 2023). In moderation, this can help in improving concentration and academic performance for the students. Regarding this, the following hypothesis has been developed for the current study.

H9: Escapism has a significant impact on academic performance

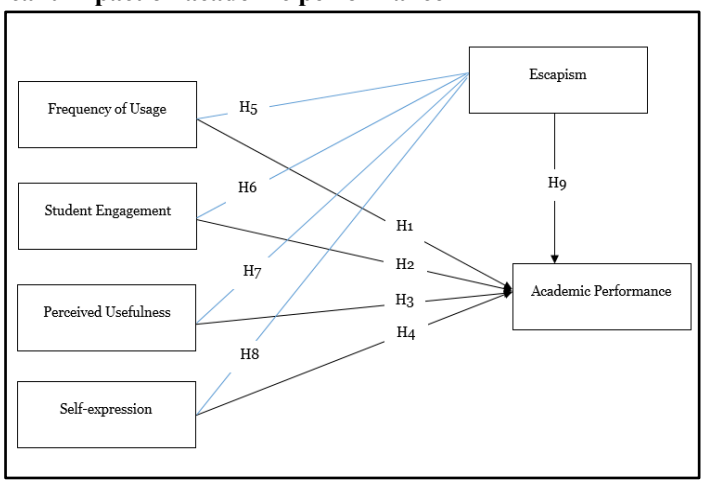


Figure 1. Conceptual Framework

Description: This is the conceptual framework of the research.

2. Research Method

The research on the role of digital literacy in mitigating the social media usage effect and enhancing academic performance can be done through quantitative research design. The quantitative research design is suitable for the research because it is suitable while a large amount of data should be collected (Mohajan, 2020). The quantitative research designs can be considered helpful to represent the result by maintaining objectivity. Hence, the chance of bias is very less in the specific case. The quantitative research design is suitable in the study in terms of doing study in such a way that can be supportive for the hypotheses testing. Hence, a primary data collection method should be followed in this context. The collection of primary data is associated with the collection of first-hand data (Hamed, 2021). The chances of addressing the gaps are recognised in this specific case and the primary data collection can increase the chance of gaining new insight. Secondary data collection is not considered effective because of the requirement of fresh information in the study to identify the more recent ideas about the different aspects of the topic.

2.1 Identify Subsections

A survey method is considered appropriate to collect information from the respondent of the study. It can be stated that a survey method is helpful to gather a large amount of data from a large number of respondents. The closed-ended questionnaire is used for conducting the data collection while the data is objective by nature. Some demographic questions can also be asked to the target respondents to gather detailed information about them. The survey method through the help of these closed ended questionnaires is associated with gaining such information that have significant

statistical value (Rouder et al., 2021). The collection of information should be done through a selected number of respondents. Hence, detection of target population and sample selection is required in this matter. The selection of sample for this study should consider the population of the student for the academic performance in the Chinese institutions. The probability sampling method needs to select a proper group of individuals from an available population without any criteria. The use of probability sampling in this study can help to decrease the chances of errors or bias while collecting data.

2.2 Participant (Subject) Characteristics

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	246
25	24	130	97	320	175	950	274	4000	351
30	26	140	103	340	181	1000	276	4500	351
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	181	1200	291	6000	361
45	40	180	118	400	196	1300	297	7000	364
50	44	190	123	420	201	1400	302	8000	367
55	48	200	127	440	205	1500	306	9000	368
60	52	210	132	460	210	1600	310	10000	373
65	56	220	136	480	214	1700	313	15000	375
70	59	230	140	500	217	1800	317	20000	377
75	63	240	144	550	225	1900	320	30000	379
80	66	250	148	600	234	2000	322	40000	380
85	70	260	152	650	242	2200	327	50000	381
90	73	270	155	700	248	2400	331	75000	382
95	76	270	159	750	256	2600	335	100000	384

Note: "N" is Population Size
"S" is Sample Size.

Figure 2. Krejcie& Morgan Sampling Table

Description: Krejcie and Morgan (1970) developed a table for determining sample size, which is widely used in the social sciences and education. This table helps researchers determine the required sample size based on the known total population size, thereby ensuring representative and accurate research results.

Here, the quantitative study can be done through taking responses from the students pursuing their higher education in China. The students are the population considered in the study and it can be recognised that over 47.33 million students are pursuing their studies in higher educational institutions (Tian & Wu. 2024). The population size is too big to be considered as survey respondents, hence, a small subset from the identified population will be drawn in this matter. The "Krejcie& Morgan" table can be used there to decide the sample size based on the size of population. It can be recognised that the size of the sample should be 384 or above while the population is above 1, 00,000 or equal to it (Muchai et al., 2021). Based on the huge population size, it can be stated that a sample size of 410 students can be appropriate to this study.

To ensure content validity, the questionnaire was pilot-tested with 60 undergraduates (excluded from the final sample); items with item–total correlations < .40 were deleted or reworded, leaving 42 Likert-scale items plus six demographic questions. The Chinese version followed Brislin's back-translation protocol. Ethical clearance was obtained from the University of Malaya Research Ethics Committee (Ref. UM.TNC2/UMREC_3914) in compliance with the Declaration of Helsinki and China's Personal Information Protection Law; written e-consent was secured before respondents could proceed to the survey questions.

Since no single existing instrument integrates all constructs of interest, the questionnaire was assembled in four steps.

(1) Validated sub-scales were identified in the literature and reproduced verbatim wherever possible.

(2) Additional items capturing platform-specific behaviours were generated through student focus groups and reviewed by subject-matter experts; wording was refined until the content-validity index met the conventional threshold.

(3) The pilot version was administered to a convenience sample of undergraduates (excluded from the final dataset); items with low item–total correlations or extreme skewness were deleted or re-phrased, leaving the final set of Likert-type items plus demographic questions.

(4) The Chinese version was produced following Brislin's back-translation protocol.

Internal-consistency reliability for each sub-scale (Cronbach's α) ranged from .831 to .838, exceeding the .70 cut-off.

The selection of sample and formation of questionnaire is followed by the data analysis in the research work. Software like IBM SPSS can be selected in the study to analyse the objective data. The result that is to be generated through the help of IBM SPSS software is considered beneficial to test the hypotheses (Fayaz et al., 2022). The influence of mediating variables in the study can also be done through sobel tests that can be also done though the help of these

software. However, some relevant ethical guidelines should also be followed in this research that mainly includes considering the importance of privacy of the respondents. It is also associated with maintaining integrity and confidentiality as much as possible. Relevant rules and regulation related to data analysis and collection is followed in the study to avoid any kind of legal risk.

3. Results

3.1 Demographic Details

The data in the table below highlights the entire social intercessor participant's male and female distribution, its age group and the ethnicity is also indicated. As for gender distribution, the female respondents are higher than the male respondents at 57.1% (234) and the males are slightly lower at 42.7% (175), respectively. When it comes to age distribution, the largest percentage is that of participants who are 17- 19 years old accounting for 32.9% (135 participants). Third are those in the age bracket 20 — 22 years with 24.9%, 102 participants and finally those above 22 years were 23.4%, 96 participants.

Table 1. Demographic analysis

		Count	Column N %
Gender	Male	175	42.7%
	Female	234	57.1%
Age	Below 17 years	76	18.5%
	17 to 19 years	135	32.9%
	20 to 22 years	102	24.9%
	Above 22 years	96	23.4%
Ethnicity	Han	93	22.7%
	Hui	138	33.7%
	Zhuang	76	18.5%
	Others	103	25.1%

Description: This is the demographic details of this research

The other age group comprises participants below 17 years, and a total of 76 of them, representing 18.5%. Based on ethnicity, the highest proportion of the Hui at 33.7% (138) participants followed by Han at 22.7% (93) participants. Zhuang participants are 18.5% (76 persons), respondents from other ethnic origins are 25.1% (103 persons). In total, the visual material demonstrates that a wide range of individuals of different gender, age, and ethnicity are included among members of the community.

3.2 Reliability Analysis

Table 2. Reliability Statistics (Cronbach Alpha)

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.831	.838	36

Description: The overall internal reliability of Cronbach's Alpha is 0.831 for the 36 BFI items and 0.838 with standardized items. The table provides descriptive data of the 36 items assessed in the 410 participants.

Table 3. Mean and Deviation Statistics

Item Statistics	Mean	Std. Deviation	N
FU1	4.3854	.98288	410
FU2	3.5293	1.25301	410
FU3	3.9512	1.10680	410
FU4	3.8561	1.06799	410
FU5	4.2073	1.07810	410
FU6	3.9244	1.10639	410
SE1	4.4122	.95797	410
SE2	3.4927	1.25723	410
SE3	3.9610	1.10497	410
SE4	3.8366	1.10129	410
SE5	4.1829	1.04106	410
SE6	3.9293	1.11332	410
PU1	4.1000	1.11327	410
PU2	3.9195	1.22559	410
PU3	3.6902	1.21890	410
PU4	3.8171	1.06199	410
PU5	4.0951	1.05970	410
PU6	4.0073	1.11115	410
S1	4.3585	.96427	410
S2	3.6439	1.26453	410
S3	3.9293	1.12859	410
S4	3.8195	1.08630	410
S5	4.1683	1.07356	410
S6	3.9463	1.11537	410
E1	4.3512	.98326	410
E2	3.6439	1.25288	410
E3	3.8902	1.14698	410
E4	3.8366	1.09461	410
E5	4.1341	1.09189	410
E6	3.9610	1.10054	410
AP1	4.4049	.95727	410
AP2	3.5122	1.25135	410
AP3	3.9268	1.11206	410
AP4	3.8488	1.08177	410
AP5	4.1829	1.07344	410
AP6	3.8951	1.11720	410

Description: All the means range from 3.49 to 4.41, which means that the participants had a high level of agreement on all the items. Standard deviations ranging from 0.95 to 1.26 indicate moderate variability of the responses.

3.3 Sobel Test

Table 4: Sobel Test for Academic Performance and Escapism

Coefficientsa						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.799	.113		7.081	.000
	E1	.829	.025	.851	32.764	.000

a. Dependent Variable: AP1

Description: Relationship between Academic Performance and Escapism

Table 5. Sobel Test for Frequency of Usage

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.716	.125		5.747	.000
	FU1	.829	.028	.829	29.892	.000

a. Dependent Variable: E1

Description: Relationship between Escapism and Frequency of Usage

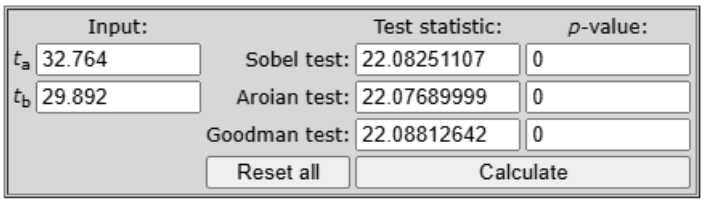


Figure 3. Sobel Test for Frequency of Usage

Description: The desired value for Sobel test should be greater than 1.96 wherein the t-score value for the mediating variable “Escapism” is 32.764 and the t-value for the first independent variable Frequency of Usage is identified to be 22.082 which signifies a significant mediating impact of Escapism on the relationship between Academic Performance and Frequency of Usage.

Table 6. Sobel Test for Student Engagement

Coefficientsa						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.535	.124		4.331	.000
	SE1	.865	.027	.843	31.614	.000

a. Dependent Variable: E1

Description: Relationship between Escapism and Student Engagement

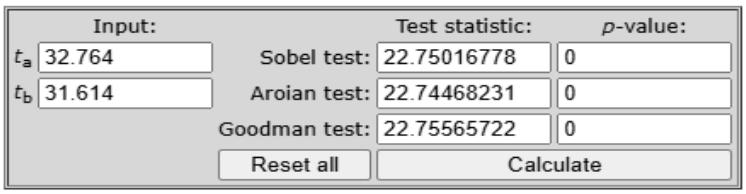


Figure 4. Sobel Test for Student Engagement

Description: The t-value for the second independent variable “Student Engagement" is identified to be 22.750 which is also higher than the required t value of 1.96 and thus it can be concluded that there is a significant mediating impact of Escapism on the relationship between Student Engagement and Academic Performance.

Table 7. Sobel Test for Perceived Usefulness

Coefficientsa						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.721	.166		16.404	.000
	PU1	.398	.039	.450	10.187	.000

a. Dependent Variable: E1

Description: Relationship between Escapism and Perceived Usefulness

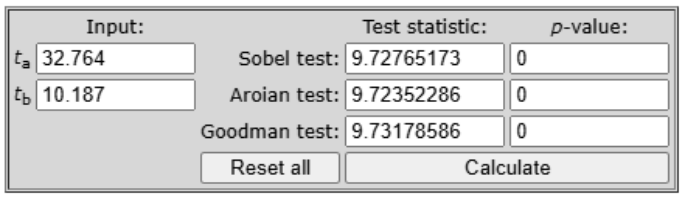


Figure 5. Sobel Test for Perceived Usefulness

Description: The t-value for the third independent variable “Perceived Usefulness” is identified to be 9.727 which is also greater than the statistically ideated 1.96 thereby referring to a significant mediating impact of Escapism on the relationship between Perceived Usefulness and Academic Performance.

Table 8. Relationship between Escapism and Self-expression

Coefficientsa						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.840	.138		6.080	.000
	S1	.806	.031	.790	26.031	.000

a. Dependent Variable: E1

Description: Sobel Test for Self-expression

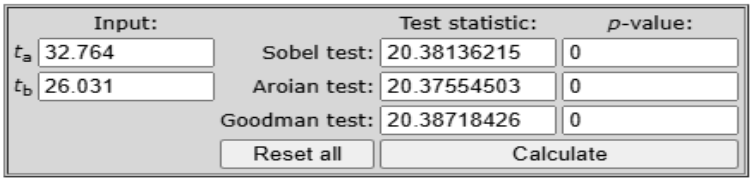


Figure 6. Sobel Test for Self-expression

Description: The t-value for the fourth independent variable "Self-expression" is observed to be 20.38 which is significantly higher than 1.96 exhibiting a significant mediating impact of Escapism on the relationship between Self-expression and Academic Performance.

3.4 Hypothesis Testing

Table 9. Hypothesis Testing

Hypotheses	Result
H1: Frequency of usage has a significant impact on academic performance	Not Supported
H2: Student engagement has a significant impact on academic performance	Supported
H3: Perceived usefulness has a significant impact on academic performance	Supported
H4: Self-expression has a significant impact on academic performance	Supported
H5: Frequency of usage has a significant impact on escapism	Supported
H6: Student engagement has a significant impact on escapism	Supported
H7: perceived usefulness has a significant impact on escapism	Supported
H8: Self-expression has a significant impact on escapism	Supported
H9: Escapism has a significant impact on academic performance	Supported

Description: From the table it can be identified that the assumptions made exploring the interplay of the different variables have been contrasted with the data acquired from the responses. It led to the identification of the viability of all the hypotheses undertaken into the study apart from H1 that is focussed on assessing the impact of Frequency of Usage on Academic Performance which has not been validated by the data.

4. Discussion and Conclusion

This work establishes aspects like self-assertion, students' involvement and perceived relevance are positively associated with the enhancement of academic performance in the course. These findings have some commonalities with some aspects of prior work and present new ideas at the same time. Surprisingly, the present study does not corroborate the hypothesis of what may be described as a direct positive effect of social media on academic achievement. However, it emphasizes on escapism which has a very big impact on the academic performance depending on the type of game. The findings are that escapism plays a role in controlling the amount of self-assertion and immersion, which influence students' performance. However, the study concerns itself with the fact that escapism is as important for assessing a student's digital literacy as the other factors discussed above. The finding of this research corroborates earlier work that perceived usefulness is actually closely linked with the ability of the medium in meeting the needs of the user. Likewise,

self-expression when practiced with digital competence is also found to support higher education students 'performance in academic settings. Therefore, the study also presents a scepticism to the existing knowledge by revealing that the foe user frequency need not necessarily mean low academic results, an issue, which has not been discussed in the previous discussions comprehensively.

This is a clear indication that promoting the development of the abilities in self-expression and level of engagement should be a greater factor of consideration than is the arguably correct perception that more of the product should be used. However, it is good to note that the study attained the research objective despite the following limitations. Firstly, the limitations presented by the current study are the research sample that is comparatively small, it only includes Chinese students exclusively. To a certain extent, this limitation limits the applicability of the study results to other cultural and educational climates. As for these limitations, these general analysis strategies may be replaced by primary qualitative methods in the subsequent studies. For example, conducting surveys with teachers in higher education can contain useful insights about the engagements of educators in enhancing the digital literacy of the society. In addition, more research should be devoted to identifying and promoting the proper and effective approaches for the improvement of digital literacy of Chinese higher learning institutions.

Subsequent researchers are strongly advised to conduct a study on the involvement of teachers in developing the use of digital products in students' learning alongside the effects on student's performance. The areas that have not been investigated, but have potential to affect learners' digital literacy and academic performance, should also be explored to increase knowledge on this subject. As such, future research will elaborate and expand on the findings of this research and offer practical strategies for institutions of higher learning. This study also revealed that self-assertion, interaction, and diversion are central in performance outcomes. It posits a more inclusive concept of digital literacy in which different cultures can be considered so as to effectively prepare students for better academic performance in the time of digital learning.

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Authors contributions

Jiaqi Liu: Methodology, Software, Validation, Formal analysis, Investigation, Data curation, Writing – original draft, Visualization.

Prof. Dr Hamedi Mohd Adnan and Dr. Nur Izzati Binti Aziz: Conceptualization, Resources, Supervision, Project administration, Writing – review & editing.

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Data sharing statement

No additional data are available.

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