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How Cyber Stalking and Cyber Bullying Affect Students' Open Learning

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ABSTRACT This paper aims to bridge the literature gap concerning the use of social media to conduct collaboration learning and explore its effect on student performance through cyberstalking (CS) and cyberbullying (CB). To achieve the study objective, this study employed a questionnaire as the main data collection method and distributed it to 538 university students based on both the technology acceptance model and constructivism theory, all of whom use social media. The findings were obtained via a quantitative research method, structural equation modeling. This study found a significant relationship between perceived usefulness, perceived ease of use, and perceived enjoyment with social media use for open learning. However, this study found a negative relationship from social media use on open learning that was dampened by CB, which is considered a dampening factor. Also, open learning was reported to be negatively influenced by perceived usefulness as CS was found to dampen the relationship with open learning.

INDEX TERMS Cyber stalking and cyber bullying, social media use, open learning.

I. INTRODUCTION

The term open learning is defined as "an inward feeling expressed by outward behavior on this strategy, which involves students in established, sustained learning groups or teams" [1]. The creation of practical online formats was caused by the rapid expansion of communications technology. Some tools are inexpensive to use to create an environment suitable for open learning [2]. Open learning refers to an educational approach whereby groups work together to solve a problem, complete a task, or create a product. Student academic performance was reported to be strongly enhanced by social media. Several channels for student communication and interaction were made possible through the use of computer-supported learning environments [3]. The rapid adoption of social media as a major communication tool is being witnessed for the purpose of student learning [4]. Most universities have the foundations and support to start using social media, but their teaching staff lacks the skills to use such tools as observed by Tess [5], which looked at the use of social media in higher education. Positive and negative student attitudes towards conducting learning were combined with the use of social media, which is core of most studies in this field. Some studies have shown student attitudes towards social media use within academic environments. Such attitudes highlighted that students find social media to be fun, meaningful, and interactive. It also gave students the chance to engage in activities besides learning, such as motivating peers and receiving feedback [6], [7]. In comparison to boys and older adolescents, girls and younger victims were reported to be the most affected by cyber stalking and cyber bullying [8], even when they experienced the same incidents [9]. Features such as multiple aggressors, persistence, repetition, and covert and anonymous harassment in aggregate are responsible for adolescent suffering [10]. 25,000 children in 25 European countries participated in a study by Livingstone *et al.* [9], in which 87% were reported to access the internet from home and 63% accessed the internet at university. Despite the positive side of online interactions and connectivity, some negative concerns were reported such as exposure to cyber stalking and cyber bullying [11]. Cyber stalking and cyber bullying are carried out by individuals or groups through the use of electronic tools to harass or threaten individuals through email, mobile messaging, social networks, or web pages. These concepts

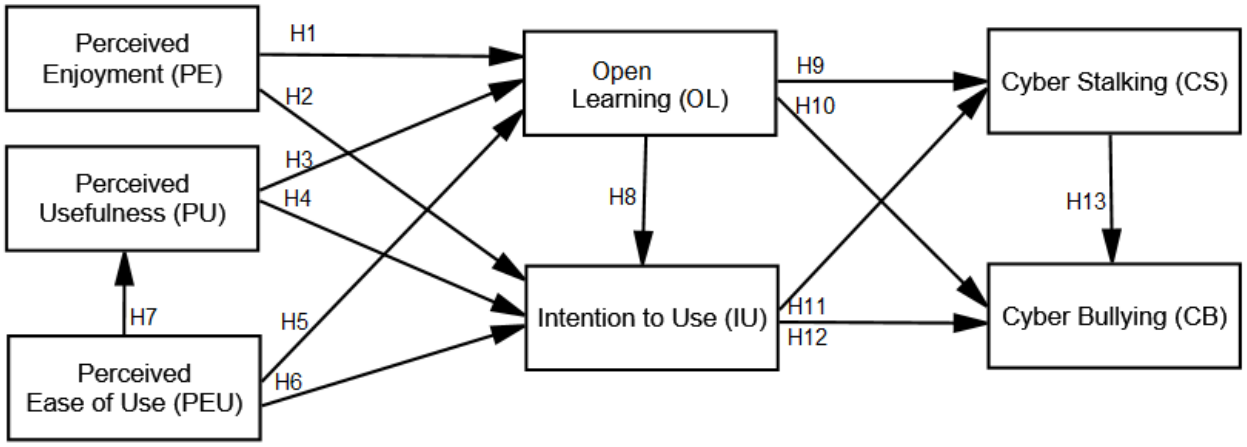

FIGURE 1. Research model and hypotheses.

are not novel but little research has been done to address them. It is reported that cybercrime offenses are increasing through the social media use [12] and that some of these offences take place within universities [13]. To address the literature gap and to provide recommendations for future research, this study presents three new insights into the effect of student intent to use social media towards open learning and the moderating role of cyber stalking and cyber bullying on academic performance by: (i) determining the factors that influence student intentions to use social media to participate in open learning, (ii) examining relationships between all factors; (iii) investigating the significance of the moderating role of cyber stalking and cyber bullying on open learning and social media use; (iv) developing a model for student intentions to use social media to participate in open learning to improve their academic performance.

II. RESEARCH MODEL AND HYPOTHESES

This research considers the Perceived Enjoyment (PE), Perceived Usefulness (PU), and Perceived Ease of Use (PEU) to be independent variables, and Open Learning (OL) and Intention to Use Social Media for Learning (IU) to be mediator variables. The dependent variable is Cyber Stalking (CS) and Cyber Bullying (CB). See Figure 1.

A. OPEN LEARNING

Open learning refers to a learning process where students have the chance to work in groups so that learning is fostered by interpersonal interactions, team cooperation, and active learning [4]. In a study by Balakrishnan and Lay [14], a number of factors were examined to determine their influence on student intensions to use social media. These factors were engagement, open style, and independent style from the social media use acceptance model. The use of Facebook was reported to improve active open learning and develop robust and engaging students-lecturer connections. Therefore, this research claims that open learning increases academic performance. In contrast, [15]–[17] students and researchers have positive attitudes and intentions to use social media for open learning and educational purposes.

B. PERCEIVED USEFULNESS

Perceived Usefulness refers to "the extent to which individuals believe that using a particular system would enhance his or her job performance" [23]. The acceptance of Long-Term Evolution (LTE) services was investigated in terms of perceived usefulness and found to be largely influenced by user intentions to use the service [21]. Furthermore, a continued intention to use a short message service that provided utilitarian benefits to users in search of effective communication alternatives was influenced by perceived usefulness [22]. Some researchers found that continuing intention to use social media for open learning was positively influenced by perceived usefulness. This study uses perceived usefulness to refer to student feelings of how much social media use for open learning improves academic performance.

C. PERCEIVED EASE OF USE

Perceived ease of use refers to the degree to which an individual believes that using a particular system is free of effort [20]. Davis [20] further added that perceived ease of use also influenced technology adoption through consumer attitudes in addition to behavioral intentions. These findings are in line with other studies confirming the positive relationship between perceived ease of use and attitude [23]. Also, some researchers found that continued intention to use social media for open learning was strongly influenced by perceived ease of use. Perceived ease of use was used in this study to refer to the degree to which students feel that using social media for open learning would improve academic performance.

D. PERCEIVED ENJOYMENT

Perceived Enjoyment refers to the extent to which the service offered by Learning Management Systems (LMS) is

perceived to be enjoyable in its own right, separate from any expected performance consequences [24]. Several terms such as hedonic motivation, critical intrinsic and extrinsic motivation for adopting IT systems and services were used in previous research to refer to perceived enjoyment [24], [25]. The perceived values of mobile internet from cognitive elements such as usefulness and fees have perceived enjoyment as a determining factor [22]. The continuous intention of social virtual service usage is largely determined by perceived enjoyment as claimed by Mäntymäki and Salo [26]. Following Davis [20], this study used perceived enjoyment to refer to the extent to which using social media is perceived as enjoyable in its own right, apart from any performance consequences. Therefore, this study uses perceived enjoyment to refer to the extent to which students believe that using social media for open learning is integral to their academic performance.

E. INTENTION TO USE SOCIAL MEDIA FOR LEARNING

According to Venkatesh *et al.* [25], intention to use refers to the willingness of users to use a technology. The dimension perceived value (i.e., hedonic, utilitarian, and social value) and its influence on behavioral intention to use location-based social networking services was examined by Yu *et al.* [27]. The intentional use of social media was also examined by Romero-Hall [28], who reported that social media spaces provided awareness of self-directed, voluntary, and informal learning opportunities, engaged students in conversations with their peers, and expanded the learning experience beyond the traditional classroom. In same vein, intentions to use social media for open learning were examined by previous studies. In this study, intention to use social media refers to the extent to which students feel that academic performance is enhanced through intentions to use social media for open learning. Similarly, in previous research stages, the hypothesis about the significant relationship between open learning through social media and student intention to use social media was supported [29]–[32].

F. CYBER STALKING

Cyber stalking refers to ''an escalated form of online harassment directed at a specific person that causes substantial emotional distress and serves no legitimate purpose, the action is to annoy, alarm, and emotionally abuse another person'' [33]. Both 'cyber stalking' and 'online harassment' are used interchangeably throughout the related literature. Individuals who carry out such actions are called cyber stalkers. ''A cyber stalker does not present a direct threat to a victim but follows the victim's online activity to gather information and make threats or other forms of verbal intimidation'' [34]. Several issues were highlighted by the research done in this area. Examples of such issues are the influence of online communities on criminal behavior including generating of an online identity, seeking information on individuals using only very limited information, and facilitating relationships with individuals through social media, which has generated a new and dangerous form of criminal stalking behavior known as cyber stalking [35]. The reason behind the emergence cyber bullying, cyber stalking, and cyber abuse can be traced to internet safety conditions that have not evolved at the same rate as social networking's popularity [36], [37]. Similar to stalking, bullying is a behavior that has troubled individuals and groups for a long time, which has become easier through the use of social networks [36], [38], [39].

G. CYBER BULLYING

The term cyber bullying is different from cyber stalking as the former takes place among minors, and is subtler in nature [40]. Cyber bullying has been reported as an international issue [41]. This issue is behind internet-based harassment, and in some cases student suicide. Normally, victims of such bullying are usually particular students rather than a group of students. Despite many incidents of cyber bullying, traditional bullying remains more pervasive than cyber bullying in terms of the number of incidents [42]. Heirman and Walrave [43] reported a correlation between inappropriate communication and cyber bullying. The influence of cyber bullying remains unacknowledged by educators due to its obscurity [38], [39], [43].

III. RESEARCH METHODOLOGY

A. PROCEDURE AND PARTICIPANTS

This study was held in classrooms with open learning atmospheres within three different faculties at Universiti Teknologi Malaysia, which is among the five largest universities within Malaysia based on student numbers. Undergraduate students from 18 social science and humanity classes under three different faculties participated in this study, (Faculty of Computing, Faculty of Education, and Faculty of Management). SPSS 23 package software was used to analyze data from 595 surveys. 18 responses were missing and there were 39 outliners. After the exclusion of these responses, 538 was the final number of surveys to be analyzed. The model's validity using confirmatory factor analysis by employing Square Structural Equation Modeling (AMOS).

B. INSTRUMENTATION

A survey was used in this study based on a review of related literature. The scales used in this research were predefined, established measurements used in previous research. Four items were adapted from previous study to measure open learning from [44] was used. The scale items used to assess perceived ease of use, perceived usefulness, perceived enjoyment and intention to use were adapted from previous research, with four items each to measure reliability and validity [23]. For the cyber bullying and cyber stalking items, four items for each category were adapted from [38], [39], [45], and [46]. A five-point Likert scale was adopted for the questionnaire items (with 1: strongly disagree, 2: disagree, 3: neutral, 4: agree, and 5: strongly agree).

TABLE 1. Demographic data of respondents.

No	Variable	Type	Frequency	No	Variable	Type	Frequency
1	Gender	Male	234	3	Faculty	Computing	155
		Female	304			Education	181
2	Age	18-21	81			Management	202
		22-25	233	4	Level of education	Level 1	83
		26-29	197			Level 2	200
		30 and more	27			Level 3	107
						Level 4	148

TABLE 2. Reliability statistics.

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	No of Items
0.932	0.932	7

TABLE 3. Mean interval used in analysis [47].

Mean interval	Respondents' Level of Degree of Agreement
1.00 – 2.32	Low level
2.33 – 3.65	Medium level
3.66 – 5.00	High level

IV. RESULT AND ANALYSIS

A. DESCRIPTIVE STATISTICS OF DEMOGRAPHIC DATA

Background of respondents is obtained based on the results of the questionnaire. The analysis can be seen in Table 1, which is easily understood and supported by the explanation. The results of frequency descriptive analysis in described in Table 1. There are 234 male respondents and 304 female respondents, indicating more female than male respondents. Moreover, based on their age groups, 81 students are 18-21 years old, 233 students are 22-25 years old, 197 students are 26-29 years old, and 27 students 30 years old and above. In addition, 155 students are from faculty of computing, 181 students are from faculty of education, and 202 students are from faculty of management. Finally, the demographic based level of education, 83 students are from level 1, 200 students are from level 2, 107 students are from level 3 and 148 students are from level 4.

B. RELIABILITY OF THE VARIABLES

From the analysis have done on the final questionnaire, as for the reliability of the study, alpha Cronbach value was calculated to ensure stability coefficient alpha of the total degree of the questionnaires, and the stability coefficient for all the paragraphs of the questionnaire (0.930). Table 2 shows that all the variables had high are reliability (more than 93%) which reflects the powerful of the data collected. See table 2 and table 3.

The current section provides descriptive analysis for seven characteristics of using social media for open learning. The characteristics are: open learning, perceived usefulness, perceived ease of use, perceived enjoyment, an intention to use social media for learning, cyber bullying and cyber stalking. The analysis comprises mean, standard deviation and the level of using social media affecting the students learning performance. The mean interval score identifies the importance of each item based on the level of agreement per variable under a factor as illustrated in Table 3.

Tables 4 displays the measurement of seven factors as follows: measurement of open learning, measurement of perceived usefulness, measurement of perceived ease of use, measurement of perceived enjoyment, measurement of intention to use social media for learning, measurement of cyber bullying and measurement of cyber stalking. Reputation recorded standard deviation of all values less than (0.669), indicating that the responses were not widely scattered from the mean. In addition, the aforementioned dimensions of interval mean levels scored over (3.8549) reflecting high level of importance on the perceived characteristics of using social media for open learning to affect learning performance of research students in higher education. Moreover, Table 4, shows that all the variables had high are reliability (more than 93%) which reflects the powerful of the data collected. Measuring cyber bullying had got (0.902); the measuring cyber stalking is (0.897); the measuring perceived ease of use is (0.886); the measuring open learning is (0.885); the measuring intention to use social media for learning is (0.861); the measuring perceived enjoyment is (0.856); and the measuring perceived usefulness is (0.831). See Table 4.

C. CONVERGENT VALIDITY OF MEASUREMENTS

Hair and Ringle [62] state that convergent validity can be confirmed using three methodological procedures: composite reliability (CR), factor loadings and Average

TABLE 4. Reliability of the variables.

No	Variables	Cronbach's Alpha	Mean	Std. Deviation	No of Items
1	Measuring Open Learning (OL)	0.885	3.8549	0.61172	4
2	Measuring Perceived Usefulness (PU)	0.831	3.5926	0.54842	4
3	Measuring Perceived Ease of Use (PEU)	0.886	3.6358	0.66956	4
4	Measuring Perceived Enjoyment (PE)	0.856	3.7679	0.66085	4
5	Measuring Intention to Use Social Media for Learning (IU)	0.861	3.6444	0.65863	4
6	Measuring Cyber Stalking (CS)	0.897	3.7446	0.64695	4
7	Measuring Cyber Bullying (CB)	0.902	3.7850	0.59288	4

TABLE 5. Confirmatory factor analysis results.

No	Variables	Code	Factors Loading	Cronbach's Alpha	Composite Reliability	AVE	R Square
1	Open Learning (OL)	OL1	0.811	0.833	0.926	0.699	0.506
2		OL2	0.799				
3		OL3	0.823				
4		OL4	0.839				
5	Perceived Usefulness (PU)	PU1	0.799	0.945	0.899	0.609	0.529
6		PU2	0.821				
7		PU3	0.810				
8		PU4	0.823				
9	Perceived Ease of Use (PEU)	PEU1	0.834	0.846	0.896	0.612	0.000
10		PEU2	0.805				
11		PEU3	0.864				
12		PEU4	0.838				
13	Perceived Enjoyment (PE)	PE1	0.876	0.942	0.927	0.641	0.000
14		PE2	0.836				
15		PE3	0.829				
16		PE4	0.802				
17	Intention to Use Social Media for Learning (IU)	IU1	0.800	0.837	0.907	0.598	0.621
18		IU2	0.739				
19		IU3	0.822				
20		IU4	0.871				
21	Cyber Stalking (CS)	CS1	0.869	0.877	0.903	0.600	0.579
22		CS2	0.834				
23		CS3	0.875				
24		CS4	0.835				
25	Cyber Bullying (CB)	CB1	0.811	0.931	0.921	0.610	0.507
26		CB2	0.809				
27		CB3	0.833				
28		CB4	0.864				

Variance Extracted (AVE). The suggested lower limit for composite reliability (0.70) was exceeded by the identified values, which were between 0.896 and 0.927. The recommended lower limit for the factor loadings was also surpassed, with results between 0.73 and 0.87. As Table 5 indicates, the loadings show that the factors were allocated the appropriate items, which is equal to or above 0.50. The factor must be assessed through the loading of pertinent indicators, as Al-Rahmi *et al.* [29] have emphasized. With results between 0.598 and 0.699 for the (AVE), this also exceeded the suggested figure of 0.5 as indicated by Hair and Ringle [62] for all the three tests of convergent validity. As well, the square root of the average variance shared by a single construct's items should not be exceeded by the correlations between the items in two constructs, as indicated by Hair and Ringle [62]. Table 5 presents the statistical model's overall confirmatory factor analysis (CFA) with R Square.

TABLE 6. Inter-variables correlation matrix.

Variables	OL	PU	PEU	PE	IU	CS	CB
Open Learning (OL)	**1.000**						
Perceived Usefulness (PU)	0.616	**1.000**					
Perceived Ease of Use (PEU)	0.665	0.631	**1.000**				
Perceived Enjoyment (PE)	0.666	0.536	0.674	**1.000**			
Intention to Use Social Media for Learning (IU)	0.565	0.545	0.631	0.504	**1.000**		
Cyber Stalking (CS)	0.730	0.699	0.663	0.704	0.683	**1.000**	
Cyber Bullying (CB)	0.773	0.580	0.654	0.710	0.508	0.653	**1.000**

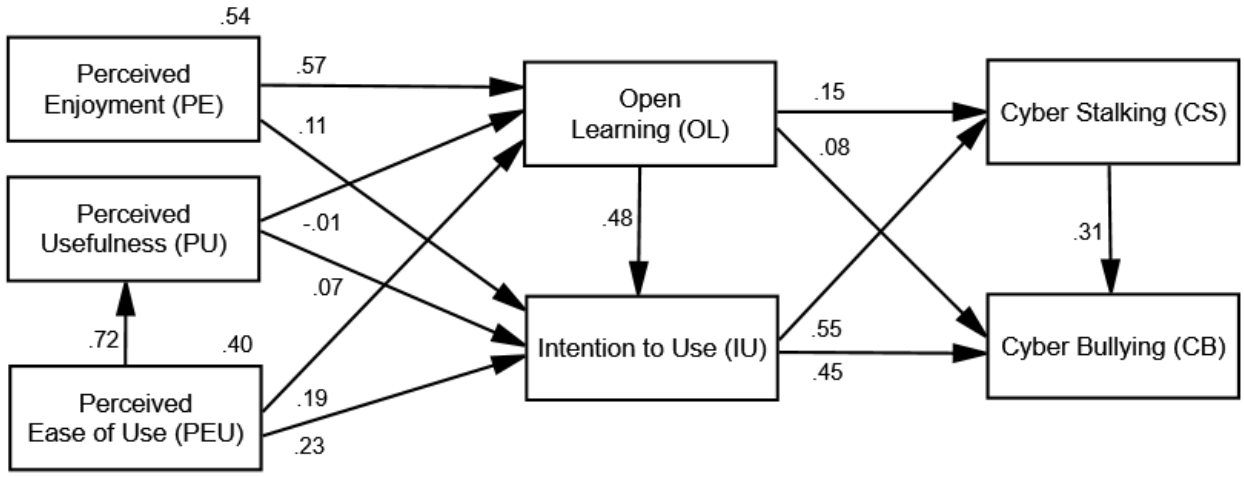

FIGURE 2. Research model results.

D. CORRELATION OF THE VARIABLES

The term correlation coefficient is used to measure linear association between two variables and values of correlation coefficient are always between -1 and $+1$. A correlation coefficient of -1 indicates two variable are perfectly related in a negative linear relations and a correlation coefficient of $+1$ indicates that two variables are perfectly related in a positive linear sense whereas a correlation coefficient of 0 indicate that there is no linear relationship between the two variables. See Table 6.

E. ANALYSIS OF THE STRUCTURAL MODEL

In order to investigate the different constructs' correlations, the hypotheses were assessed using the Square Structural Equation Modeling (AMOS). The identified path coefficients are presented in figure 1, while the hypothesis testing outcomes are outlined in figures 2. Additionally, table 5 also provides the reliability and validity scores. The subsequent Structural equation modeling SEM stage adopted confirmatory factor analysis CFA in order to verify the posited hypotheses. Figure 2 indicates that all hypotheses were accepted.

The hypotheses developed for the factors' correlations, as well as the research model, are supported by the findings. The structural framework's standard errors and unstandardized coefficient results are presented in Table 7. It is apparent that the structural framework's assessment for verifying hypotheses and determining the framework's validity is sound, with robust results given in relation to the crucial statistical measures.

Regarding the first hypothesis, the relationship between perceived enjoyment and open learning achieved the following results ($\beta = 0.573$, $t = 14.492$, $p < 0.001$). Therefore, the first hypothesis is positive and supported. The second hypothesis is also positive and supported, as the analysis indicates a relationship between perceived enjoyment and intention to use social media for learning ($\beta = 0.108$, $t = 3.642$, $p < 0.001$). The next direct effect is the relationship between perceived usefulness and open learning ($\beta = 0.007$, $t = 0.169$, $p < 0.001$). Thus, hypothesis number 3 is negative and unsupported. Moreover, hypothesis number four is a positive and supported, as the analysis also indicates a strong relationship between perceived usefulness and intention to use social media for learning ($\beta = 0.067$, $t = 2.324$, $p < 0.001$). The next hypothesis five is also positive and supported, as a relationship exists between perceived ease of use and open learning ($\beta = 0.192$, $t = 4.283$, $p < 0.001$). Perceived ease of use was further found to be positively and significantly related with intention to use social media for learning ($\beta = 0.235$, $t = 7.887$, $p < 0.001$). The relationship between perceived ease of use and perceived usefulness was also found to be positive and significantly ($\beta = 0.724$, $t = 22.466$,

TABLE 7. Hypotheses testing results of structural model.

H	Independent	Relationship	Dependent	Estimate	S.E.	C.R.	P. Value	Result
H1	PE	→	OL	.573	.040	14.492	000	Supported
H2	PE	→	IU	.108	.030	3.642	000	Supported
H3	PU	→	OL	-.007	.044	-.169	.866	Unsupported
H4	PU	→	IU	.067	.029	2.324	.020	Supported
H5	PEU	→	OL	.192	.045	4.283	000	Supported
H6	PEU	→	IU	.235	.030	7.887	000	Supported
H7	PEU	→	PU	.724	.032	22.466	000	Supported
H8	OL	→	IU	.476	.025	18.784	000	Supported
H9	OL	→	CS	.149	.043	3.484	000	Supported
H10	OL	→	CB	.080	.038	2.109	.035	Supported
H11	IU	→	CS	.553	.049	11.288	000	Supported
H12	IU	→	CB	.451	.047	9.562	000	Supported
H13	CS	→	CB	.305	.034	8.971	000	Supported

Note: S.E: Standard Error; C.R: Critical Ratio.

TABLE 8. Measuring social media use for open learning.

Factor	Code	1	2	3	4	5	Mean	S.D
		f (%)	*f (%)*	*f (%)*	*f (%)*	*f (%)*		
Open Learning	CL1	5 (.9)	13(2.4)	194(36.1)	246(45.7)	80(14.9)	3.78	.911
	CL2	6 (1.1)	22(4.1)	182(33.8)	262(48.7)	66(12.3)	3.73	.831
	CL3	31(5.8)	50(9.3)	194(36.1)	196(36.4)	67(12.5)	3.62	.856
	CL4	12(2.2)	30(5.6)	190(35.3)	237(44.1)	69(12.8)	3.66	.886
	CL5	8(1.5)	28(5.2)	167(31.0)	253(47.0)	82(15.2)	3.67	.836
	CL6	11(2.0)	32(5.9)	196(36.4)	228(42.4)	71(13.2)	3.65	.887

$p < 0.001$). The next direct effect is the relationship between open learning and intention to use social media for learning ($\beta = 0.476$, $t = 18.784$, $p < 0.001$). Therefore, hypothesis number 8 is positive and supported. Also, hypothesis number nine is a positive and supported, as the analysis also indicates a good relationship between open learning and cyber stalking ($\beta = 0.149$, $t = 3.484$, $p < 0.001$). The next hypothesis ten is also positive and supported, as a relationship exists between open learning and cyber bullying ($\beta = 0.080$, $t = 2.109$, $p < 0.001$). Moreover, hypothesis number eleven is a positive and supported, as the analysis also indicates a strong relationship between intention to use social media for learning and cyber stalking ($\beta = 0.553$, $t = 11.288$, $p < 0.001$). Likewise, hypothesis number twelve is a positive and supported, as the analysis a relationship between intention to use social media for learning and cyber bullying ($\beta = 0.451$, $t = 9.562$, $p < 0.001$). Finally, the results also confirm that cyber stalking is significantly related to cyber bullying ($\beta = 0.305$, $t = 8.971$, $p < 0.001$), thus confirming hypothesis number 13.

F. DESCRIPTIVE AND ANALYSIS OF CONSTRUCTIVISM FACTORS WITH TAM

The result shows the majority of students agree and strongly agree to use social media for open learning. In other words, social media use has an influence on open learning, which in turn affects students' academic performance through knowledge sharing, information exchange, and peer discussion. These results are consistent with [38], [48], and [49], who argued that social media tools are useful for open learning. See Table 8.

As shown in Table 9, the majority of students agree and strongly agree that social media useful. In other words, social media used has an influence on perceived usefulness, which in turn affects students' academic performance. These results are consistent with [18], who argued that social media is useful for learning.

As shown in Table 10, the majority of students agree and strongly agree that social media is perceived to be easy to use. In other words, social media use has an influence on perceived ease of use, which in turn affects students' academic performance. These results are consistent with [18], who argued that social media is perceived to be easy to use for learning.

Results in Table 11 show that the majority of students agree and strongly agree on the perceived enjoyment of social media use. In other words, social media use has an influence on perceived enjoyment, which in turn affects students' academic performance. These results are consistent with [26], who argued that social media can make learning enjoyable.

Results as shown in Table 12 indicate that the majority of students agree and strongly agree in their intention to use social media for learning. In other words, social media used

TABLE 9. Measuring perceived usefulness for learning.

Factor	Code	1	2	3	4	5	Mean	S.D
		f (%)	*f (%)*	*f (%)*	*f (%)*	*f (%)*		
Perceived Usefulness	PU1	14(2.6)	19(3.5)	155(28.8)	235(43.7)	115(21.4)	3.80	.793
	PU2	4(.7)	30(5.6)	165(30.7)	249(46.3)	90(16.7)	3.64	.911
	PU3	5(.9)	44(8.2)	178(33.1)	237(44.1)	74(13.8)	3.65	.818
	PU4	5(.9)	34(6.3)	198(36.8)	226(42.0)	75(13.9)	3.60	.825
	PU5	6(1.1)	48(8.9)	155(28.8)	245(45.5)	84(15.6)	3.64	.857
	PU6	6(1.1)	41(7.6)	170(31.6)	228(42.4)	93(17.3)	4.06	.835

TABLE 10. Measuring perceived ease of use for learning.

Factor	Code	1	2	3	4	5	Mean	S.D
		f (%)	*f (%)*	*f (%)*	*f (%)*	*f (%)*		
Perceived Ease of Use	PEU1	7(1.3)	26(4.8)	192(35.9)	234(43.5)	79(14.7)	4.06	.815
	PEU2	6(1.1)	35(6.5)	191(35.5)	238(44.2)	68(12.6)	4.06	.824
	PEU3	4(.7)	16(3.0)	161(29.9)	259(48.1)	98(18.2)	3.91	.767
	PEU4	11(2.0)	37(6.9)	175(32.5)	224(41.6)	91(16.9)	3.85	.846
	PEU5	7(1.3)	23(4.3)	194(36.1)	239(44.4)	75(13.9)	3.88	.853
	PEU6	4(.7)	35(6.5)	206(38.3)	222(41.3)	71(13.2)	3.84	.852

TABLE 11. Measuring perceived enjoyment for learning.

Factor	Code	1	2	3	4	5	Mean	S.D
		f (%)	*f (%)*	*f (%)*	*f (%)*	*f (%)*		
Perceived Enjoyment	PE1	6(1.1)	16(3.0)	89(16.5)	258(48.0)	169(31.4)	4.15	.817
	PE2	5(.9)	16(3.0)	85(15.8)	267(49.6)	165(30.7)	4.02	.844
	PE3	3(.6)	14(2.6)	108(20.1)	238(44.2)	175(32.5)	3.57	.849
	PE4	2(.4)	11(2.0)	139(25.8)	267(49.6)	119(22.1)	3.87	.760
	PE5	5(.9)	24(4.5)	136(25.3)	254(47.2)	119(22.1)	3.88	.790
	PE6	7(1.3)	22(4.1)	123(22.9)	262(48.7)	124(23.0)	3.83	.816

TABLE 12. Measuring intention to use social media for learning.

Factor	Code	1	2	3	4	5	Mean	S.D
		f (%)	*f (%)*	*f (%)*	*f (%)*	*f (%)*		
Intention to Use Social Media for Learning	IU1	5(.9)	21(3.9)	156(29.0)	264(49.1)	92(17.1)	3.70	.830
	IU2	5(.9)	24(4.5)	175(32.5)	245(45.5)	89(16.5)	3.72	.844
	IU3	5(.9)	25(4.6)	157(29.2)	250(46.5)	101(18.8)	3.57	.852
	IU4	4(.7)	19(3.5)	156(29.0)	266(49.4)	93(17.3)	3.72	.815
	IU5	5(.9)	13(2.4)	149(27.7)	263(48.9)	108(20.1)	3.62	.844
	IU6	6(1.1)	20(3.7)	166(30.9)	248(46.1)	98(18.2)	3.59	.920

has an influence on students' intention to use social media for learning, which in turn affects students' academic performance. These results are consistent with [38], [39], and [48] who argued that students intention to use social media for open learning that affect their academic performance.

Moreover, the result shows the majority of students agree and strongly agree to use social media for learning, but the relationship between student intentions to use social media and student academic performance was dampened by cyber stalking. In other words, social media use has an influence on students' intention to use social media for learning, which in turn affects students' academic performance, was dampened by cyber stalking. See table 10. These results are consistent with [8] and [35], who argued that student's intention to use social media for learning that affect their academic performance was dampened by cyber stalking. See Table 13.

Furthermore, the result shows the majority of students agree and strongly agree to use social media for learning, but

TABLE 13. Measuring cyber stalking for learning.

Factor	Code	1	2	3	4	5	Mean	S.D
		f (%)	*f (%)*	*f (%)*	*f (%)*	*f (%)*		
Cyber Stalking	CS1	11(2.0)	34(6.3)	171(31.8)	235(43.7)	87(16.2)	3.56	.916
	CS2	4(.7)	24(4.5)	152(28.3)	250(46.5)	108(20.1)	3.57	.867
	CS3	6(1.1)	35(6.5)	157(29.2)	256(47.6)	84(15.6)	3.74	.812
	CS4	8(1.5)	31(5.8)	178(33.1)	251(46.7)	70(13.0)	3.63	.855
	CS5	11(2.0)	26(4.8)	170(31.6)	257(47.8)	74(13.8)	3.77	.783

TABLE 14. Measuring cyber bullying for learning.

Factor	Code	1	2	3	4	5	Mean	S.D
		f (%)	*f (%)*	*f (%)*	*f (%)*	*f (%)*		
Cyber Bullying	CB1	14(2.6)	30(5.6)	146(27.1)	273(50.7)	75(13.9)	3.86	.785
	CB2	13(2.4)	25(4.6)	174(32.3)	253(47.0)	73(13.6)	3.90	.815
	CB3	16(3.0)	24(4.5)	183(34.0)	233(43.3)	82(15.2)	3.84	.832
	CB4	11(2.0)	31(5.8)	165(30.7)	241(44.8)	90(16.7)	3.86	.826
	CB5	14(2.6)	29(5.4)	147(27.3)	253(47.0)	95(17.7)	3.64	.897

the relationship between social media use for open learning and student academic performance was reported as positive and it was dampened by cyber bullying. In other words, social media use has an influence on students' intention to use social media for learning, which in turn affects students' academic performance, which was dampened by cyber bullying. These results are consistent with [35], [38], and [48], who argued that students intention to use social media for learning that affect their academic performance was dampened by cyber bullying. See table 14.

G. DISCUSSION AND IMPLICATIONS

This study found that the development of learning environments was facilitated by social networking sites and social media through increased student collaboration and articulation. Students had healthy class discussions, peer integration, and social presence when they engaged with open learning and enjoyed using social media. These results are consistent with [38] and [48], who argued that social networks are useful for interactive learning since they are accessible and easy to navigate. It was also found that participation in active student collaboration can be promoted by the use of social media in teaching and learning [29]–[31], [51], [52]. As a result, satisfactory learning outcomes and student academic performance can be enhanced through virtual community interactions. These findings are also in line with previous literature on social media tools and their functional effectiveness [53]. This study found a positive effect from student intentions to use social media from perceived enjoyment, perceived usefulness, and perceived ease of use. These factors enhanced student academic performance by obtaining necessary resources from peers, instructors, and supervisors. The study also found that supporting complementary social media for collaboration is needed more by students on campus than face-to-face conferences [38], [48]. This study highlighted the effectiveness of using social media for open learning and online communication over face-to-face methods. Therefore, related literature and student exchanges that develop research skills further support these findings. From the literature, it was found that some studies such as [54] contradict this study's findings and other studies such as [21] support this study's findings. Schoor and Bannert [18] further highlighted that there was no significant relationship between enjoyment and intentions to use social media due to student's high level of proficiency in using related information technology. The relationship between social media use for open learning and student academic performance was observed to be dampened by cyber stalking. Thus, this study proposes that intentions to use social media are not directly influenced by student enjoyment, which directly influences open learning and may have an indirect effect through social presence or other external factors. Another possible reason for this is related to student perceptions. Perceptions of multiple social networking tools and ease of use and enjoyment might play a role in such cases. The relationship between open learning and perceived usefulness was found to be insignificant despite its positive influence on students. By reviewing related literature, some studies contradicted this study's finding whereas other studies such as Liao *et al.* [4] support this study's findings. Liao *et al.* [4] reported an insignificant relationship between user learning attitudes and perceived usefulness, which occurred because students had a high level of proficiency in using related information technology. The relationship between social media use for open learning and student academic performance was reported as positive and it was dampened by cyber bullying. In this study, perceived usefulness did not affect open learning directly but had a direct influence on intentions to use social

media for open learning. It might also have an indirect effect through perceived ease of use or other external factors. Different student perceptions on each social networking tools' usefulness and enjoyment might be another possible factor. Looking at previous literature in this area, social networking tools as a leisure activity has been mentioned and highlighted in a few studies. These studies further explained this by stating much time is wasted using these tools for useless activities such as posting useless comments or browsing webpages [55]. Such activities were also highlighted for their potential negative influence on student behavior and performance [56], [57]. Another disadvantage was mentioned by Tariq *et al.* [58], who maintained that wasting time using such tools can distract students and divert attention, resulting in negative learning outcomes. This study also pinpointed both cyber stalking and cyber bullying as moderating variables as they dampen the positive relationship between student academic performance and social media use for open learning (Figure 1 and 2). These finding are in line with previous research such as [38], [39], [48], and [59], who reported a negative impact on student academic performance from the reception of undesirable pictures, messages, or other formulas of harassment. The low levels of concentration and actual learning caused by cyber stalking and cyber bullying might be the result of these 'distractions' [60], [61]. These distractions were also reported to decrease student motivation to attend school and to cause low grades [46]. This study presents three empirical findings. The first finding is on the role of social presence and student enjoyment on student intentions use social media for open learning. Second is on the role of perceived enjoyment, perceived usefulness, intentions to use social media for open learning, and perceived ease of use on student academic performance. The third finding is the relationship between social media use for open learning and student performance, which can be dampened by cyber stalking and cyber bullying. This study presents four implications based on the obtained results. This study highlights both technology and resources as two key terms in behavioral intentions to use social media for collaboration learning and online communication. The study recommends that students make use of the resources they have to achieve open learning to increase their learning performance. The study also recommends that students willing to use social media should be encouraged to enroll in open learning rather than being forced. Through such practices, institutions can make use of all the components and tools available for the learning process. The study maintains that students should be encouraged to use social media for open learning as it positively influences their academic performance in higher education. Furthermore, students should be assisted by lecturers and supervisors in case they have any inquiries about the use of social media or knowledge sharing. Lecturers and supervisors should provide students with information that enhances student learning experiences and improves their research skills. Based on the recommendations of this study, effective anti-bullying programs should be implemented by policymakers in universities. Such procedures should be taken into consideration to stop or at least lessen cyber stalking and bullying due to their negative influence on student educational attainment.

H. INNOVATION AND CONTRIBUTION

Internationally, research on cyber stalking and cyber bullying has rapidly evolved over the last years with the findings indicating that, similarly to university and school bullying, participation is related to a number of factors, which can be both individual and contextual. In terms of individual factors, most research findings indicate that boys and girls participate equally in cyber bullying and cyber stalking, but with different forms of deviant behaviors [37], [38]. Therefore, this research indicates that regardless of the fact that these social media are there to enhance our social experiences but many negative experiences were identified on cyber bullying and cyber stalking. Therefore, contributed develop a model for identifying the significant factors that are anticipated to play a major role in minimizing cyber stalking and cyber bullying among students.

V. CONCLUSION AND FUTURE WORK

This study investigated the factors that affect cyber stalking and cyber bullying among university students. In summary, our results indicate that exposure to social media use amplifies cyber bullying and cyber stalking. Also, the current study presents the rapid growth of social media, including various Internet-based tools used worldwide by all generations. The study also highlights the role of social media in the cohesive working and open learning concepts witnessed all over the world. This is because such tools are important to learning and teaching since they enhance student learning, collaboration, and information sharing. Perceived enjoyment and ease of use were also highlighted throughout this work as factors leading to open learning within teaching and learning. Such elements are suggested to be used with caution in terms of the internet. In addition to the many benefits these tools can provide, they also expose students to violence and aggression related to cyber stalking and cyber bullying. These findings emphasize the importance of considering the roles that social media and cyber engagement play in everyday life in an effort to mitigate the negative effects associated with cyber bullying and cyber stalking. Through the use of these tools, open learning and overall student academic performance can be negatively influenced. However, this study is limited in some areas. The first limitation is related to data collection. The current study only included questionnaires and qualitative data on the perspective of students and could be missing important insights into the issues under investigation. Moreover, the sampling was limited to Universiti Teknologi Malaysia and the results of this study cannot be generalized to the private sector, school teachers, or the army, due to this limitation. Finally, the study recommends future research in other contexts and other cultures to address the limitations stated above. Future research is also recommended on other

social media tools such as smartphone activities, smartphones conferences, etc. which enable communication between peers as well as between students and their teachers.

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