

Research article

# Digital Devices on Learning Management System and its Consequences on Physical and Mental Health among University Students in Nepal

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## ABSTRACT

**Background and Objectives:** Digital tools and devices are being integrated in almost areas of human activities demanding the implementation of digital literacy in modern education, health, business, and other related activities. This study was one of few to investigate the competence of learning management system by use of digital resources, and their impact on physical and mental health in Nepalese university students.

**Material and methods:** The cross-sectional online survey was conducted among the 300 MPhil scholars during the period of Jan. 2019 to Jul. 2019 through Google Form. The nature of information was in the form of qualitative and quantitative both because the tool contained open and closed questionnaire. Frequency, percentage, word cloud, bar chart, pi-chart and chi-square test were calculated at 95% confidence level.

**Results:** Around two-third (61.7%) of the participants have had habits to use digital resources by sitting on chairs/tools. More than half (53.33%) reported that use of digital device has negative effect on physical health whereas only 12% reported towards positive effect and 8.33% were not care on the effect of using digital devices on physical health. In case of mental health, around half (46.0%) have positive effect on mental health even around one-fourth (24%) have found to be negative effect however 3.3% did not care about the effect of using digital devices. The technology users with the distance greater than 3 ft. have less problems as compared to others. An insignificant association is observed in the effect on physical and mental health with respect to gender, age, years of using mobile and laptop except as the case of distance of digital devices with effect on mental health.

**Conclusion:** The use of digital resources has negative effect on physical health and positive effect on mental health. Use of such resources with the distance greater than 3 ft. is better for health however the limited use of digital tools, use as per need only, use by making schedule, mediation, to take suggestion by the doctors, use without monotonous, appropriate breaks and comfortable body posture are major are the major techniques for the safe use of digital resources.

**Key words** Physical health, mental health, effect, digital devices, technology

## INTRODUCTION

Digital technology has been integrated into every aspect of modern life. Technology allows humans to connect without the limitations of geography, it makes processes more efficient and it supplements the intellect and effectiveness of the human brain. Digital tools and devices are being integrated in almost areas of human activities such as office, classroom, training, seminar, workshop, medicine and social awareness program demanding the implementation of digital literacy in modern education, health, business, and other related activities [1-4]. The use of digital technology has significant and positive impact on learning management system (LMS) [5], personal health [6], and mental and physical health [7]. Researches revealed that the use of digital devices facilitate faculty student interactions and in-class participation, which ultimately enhanced academic engagement and active learning [8]. Moreover, use of digital devices in classroom was effective in enhancing motivation, the ability to apply course based knowledge, and overall academic achievement among students [9-10]. It was also evident that the digital devices coupled with internet connectivity had increased active exploratory learning and was effective in promoting interactions between students and the instructor in classes [11]. In addition to academic performance, digital devices with internet connectivity were convenient for medical care [12-13], self-care [14], well-being [15], care about health threats [16], improvement of mental health, endorsement on healthy behavior [17] and weight loss [18]. However, the excessive use of digital devices in recent years has led to addiction among university students across the world. Thereby, mobile and laptop are being included as digital resources to study their

impacts on physical and mental health problems among university students.

The excessive use of digital devices may create some potentially serious physical health threats to the undergraduate and graduate students [19]. Being overly connected to such devices, University students are facing musculoskeletal and visual disorders like visual problems [20], headache [21-22], technical issues in record maintenance [23], unnecessary time consuming [24] and weight gaining [25]. The proper use of digital resources can be adopted to improve our health conditions like improving diet plan, tracking fitness efforts, diagnosing medical compliances, etc [26]. Recent studies show that students are adopting several self-prevention measures to prevent and control such problems for living healthy life [27] and personal welfare. Likewise, the excessive use of digital devices also has adverse effects on mental health of the college students. Researcher have reported a probable relationship between digital device use and psychological symptoms and suggested that the depression, sleep disorder [28] and loneliness [29] were negative consequences of digital devices and communication technology use among college students.

Hence, the use of digital devices has attracted considerable controversy concerning its advantages and disadvantages in learning management system and health care issues among university students. The current research is aimed to perceive useful qualitative information about impact of utilization of digital devices on learning management system and health care assessment among University students in Nepal.

## **MATERIAL AND METHODS**

The study is a qualitative survey and has been conducted among the MPhil scholars during the period of January 2019 to July 2019. The data were collected through the online survey. The nature of information was in the form of qualitative and quantitative both because the tool contained open and closed questionnaire. The sample size for the finite population was calculated through the online calculator "select statistical services". We assumed  $p = 50\%$  as no prior research was conducted in the country. After substituting the values, sample size determined was found to be 212. By allowing 20% non-response, the final sample size obtained was 255 which are sufficient for this study [30]. We approached to all participants i.e. 469 MPhil scholars from two departments; Faculty of Social Science and Education, and Faculty of Health, Science and Technology of NOU Nepal Open University (NOU). However, we got 300 responses during the time which consist 64% response rate.

### **Definition of variables**

The outcome variables were impact of digital devices on physical health and mental health where both variables are categories as 'negative effect', 'no effect', 'did not care yet' and 'positive effect'. The categories were determined on the basis of participants open responses on relevant related items. Whereas negative effect represents headache, eye problem back pain, neck pain, body pain, hand and arm strain, pressure in muscle, passiveness of body, energy loss. under physical health and feeling tired, time killing, loneliness, loss memory, mental stress, depression, hang mind, anxiety, brain effect, lost creativity is under mental health. Positive effect represents rest of tired body, fresh

under physical health and gaining knowledge, social relation, updating, happiness and energized, enjoyment, increase social relation, increase the mental ability, increase the confidence, reduction in stress, avoid loneliness, self-problem-solving, fostering skills, mental freshness and gain useful knowledge, increase understanding level, guidance and counseling, experience are under mental health.

Five independent variables; gender, age, years of using mobile, years of using mobile/laptop and distance of digital devices are used in this study. Gender has categorized into female (14.3%) and male (85.7%), age has categorized into three groups as 20-34 years (35.7%), 35-44 years (50.7%) and 45-60 years (13.7%). Years of using mobile has categories as; before < 4 years (7.0%), before 4-8 years (35.7%) and before  $\geq 8$  years (57.3%), similarly, years of using laptop have also categorized same as in years of using mobile before < 4 years (33.7%), before 4-8 years (44.0%) and before  $\geq 8$  years (22.3%), and distance of digital device has four categories as less than 1 ft. (25.0%), 1 ft. to 2 ft. (64.6%), 2 ft. to 3 ft. and more than 3 ft. (2.7%) however, distance of digital devices represent the distance from the sitting position of the individual.

### **Statistical analysis**

Both descriptive and inferential statistical techniques were implemented for data analysis. Frequency and percentage were calculated under descriptive statistics, whereas chi-square test was carried out under inferential statistics for the significant association of effect of physical health and mental health with six mentioned socio-demographic variables separately. Additionally, responses of the open questions

were categorized based on the theme of open responses of the respondents. The  $p$ -value  $\leq 0.05$  was considered to be statistically significant by using Statistical Package for Social Science (SPSS version 23 for Windows).

## RESULTS

The results of the study are presented in following figures and charts. Figure 1 shows that most of the respondent has been using office package in their digital devices. The highest frequency of that word cloud is 95. However, internet surfing in google, Facebook, data analysis software SPSS and other tools were also used by participants. Since all the participants are students/faculties/staffs are from academic background, hence the result is likely found in favor of learning and academic activities. Similarly figure 2 reveals the purpose of using mobile and has shown that the most of the participants use their mobile for surfing social media, establishing communication, sharing information, learning, entertaining and internet surfing. The response indicates very good command of using mobile for academic activities and social networking.

Likewise, figure 3 reveals the information about sitting position of digital device users. The data showed majority (61.7%) of the participants have habit of using digital devices by sitting on chairs or tools, whereas few (7.7%) of them have used by lying on bed, and 10.7% with sitting position on their lap.



Figure 1: Frequently using applications



Figure 1: Purpose of using mobile

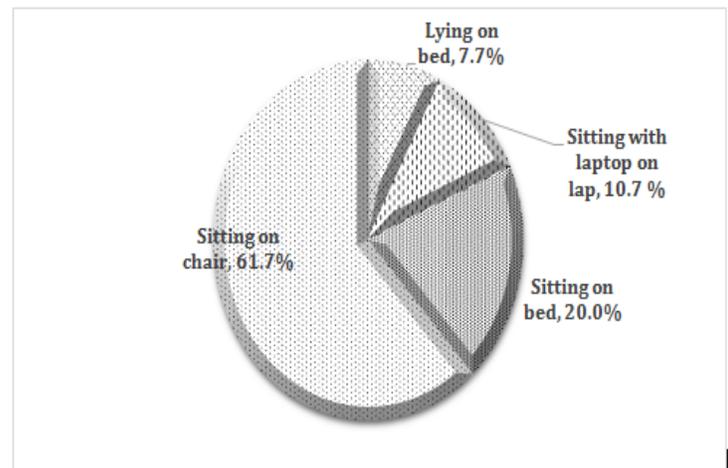


Figure 3: Sitting position during the use of digital devices

Title	Percentage	Frequency
Manage Appropriate break	2.6	7
Don't use monotonously	3	8
Consult with doctors and known person before using	3.7	10
Use device safely	3.7	10
Use with comfortable body posture	4.4	12
Use eye glass while using digital device	6.8	18
Meditation and rest	9.7	26
Use for making schedule	12	32
Use devices as per need only	26.9	72
Limited use of digital tool	27.2	73
Total	100	268

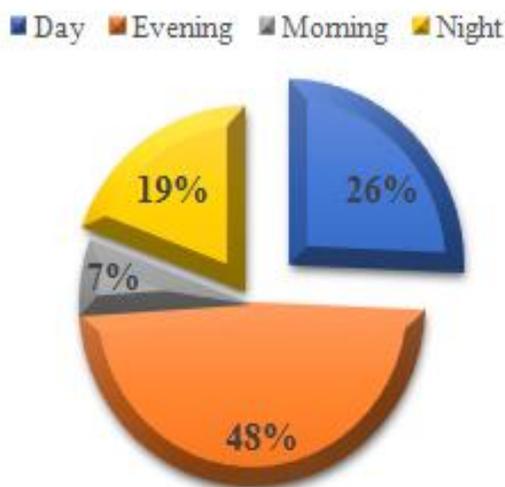
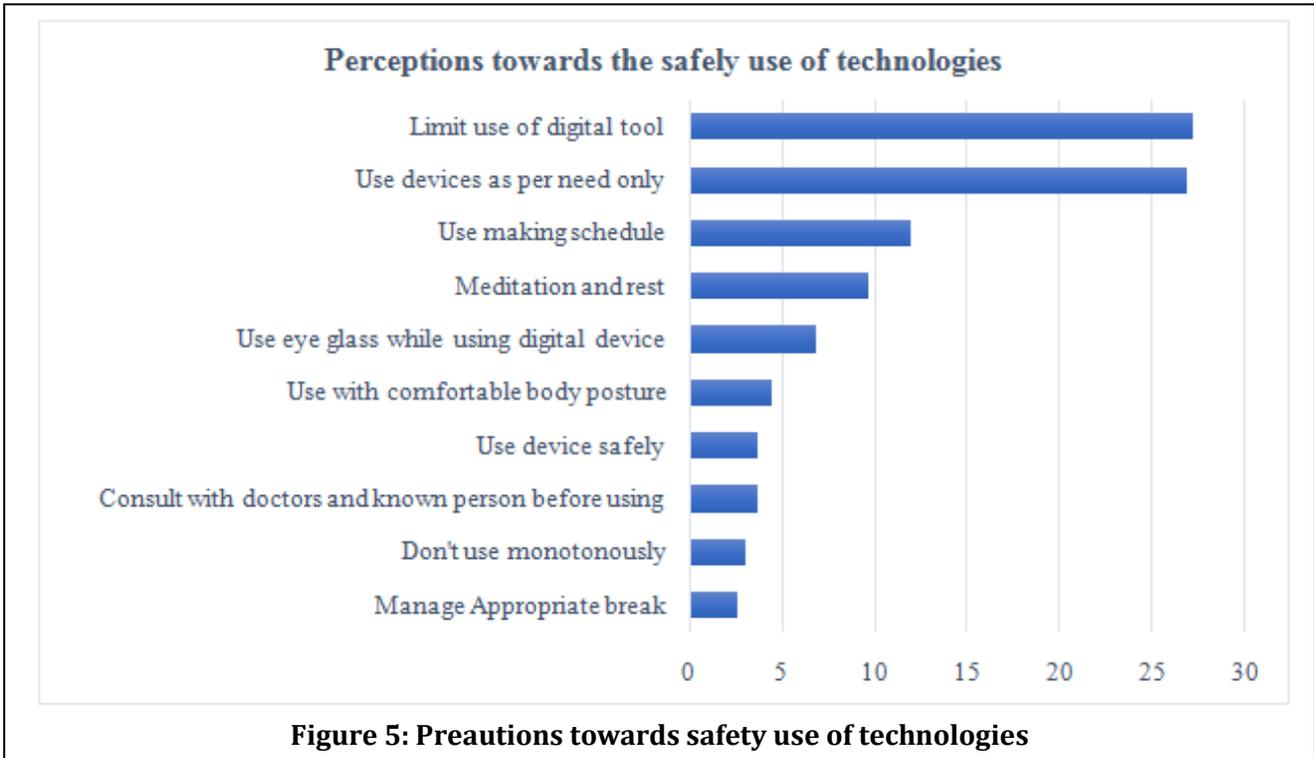


Figure 4: Preferred Time to Use Digital Devices

Participants have also asked about the good techniques for safety use of digital devices under different perceptive questionnaire mentioned in Table 1. Majority of them (27.2%) preferred to use for limited time and 26.9% prefer the utilization of digital resources only if they require them. Hence these two techniques are considered as the best techniques for the utilization of digital

resources for having minimized effect on their personal health. Manage appropriate break (2.6%) is minor solution for the effect on personal health in reference of table 1 and figure 5.

Association of effect of physical health with socio-demographic characteristics are presented in table 2, it is shown that more than half (53.33%) of respondent reported as use of digital device have negative effect, whereas only 12% and 8.33% of them have positive effect and not caring on the effect, respectively towards use of digital devices on their physical health. In relation to negative effect, those respondents who use digital device from the distance having more than 3 ft. are found to be poor (25%), whereas that rate is high for those, who use such resources from the distance 1 ft. to 2 ft. (60.9%) are using laptop before greater than or equal to 8 years (59.7%), 35-44 years age grouped (57.9%) and female (58.1%) participants. In comparison to others those users with the distances of more than 3 ft. have no effect (37.5%) in physical health. Additionally, chi-



Socio-demographic characteristics	Categories	Effect on physical health				Total	P-value
		Negative effect	No effect	Did not care yet	Positive effect		
<b>Gender</b>	Female	25(58.1)	5(11.6)	4(9.3)	9(20.9)	43(14.3)	0.08
	Male	141(54.9)	68(26.5)	21(8.2)	27(10.5)	257(85.7)	
<b>Age</b>	20-34 years	59(55.1)	24(22.4)	10(9.3)	14(13.1)	107(35.7)	0.64
	35-44 years	88(57.9)	38(25.0)	12(7.9)	14(9.2)	152(50.7)	
	45-60 years	19(46.3)	11(26.8)	3(7.3)	8(19.5)	41(13.7)	
<b>Years of using mobile</b>	Before < 4 years	11(52.4)	4(19.0)	2(9.5)	4(19.0)	21(7.0)	0.77
	Before 4-8 years	57(53.3)	26(24.3)	12(11.2)	12(11.2)	107(35.7)	
	Before ≥ 8 years	98(57.0)	43(25.0)	11(6.4)	20(11.6)	172(57.3)	
<b>Years of using laptop</b>	Before < 4 years	51(50.5)	28(27.7)	8(7.9)	14(13.9)	101(33.7)	0.67
	Before 4-8 years	75(56.8)	29(22.0)	14(10.6)	14(10.6)	132(44.0)	
	Before ≥ 8 years	40(59.7)	16(23.9)	3(4.5)	8(11.9)	67(22.3)	
<b>Distance of digital devices</b>	Less than 1 ft.	41(53.2)	18(23.4)	8(10.4)	10(13.0)	77(25.7)	0.10
	1 ft. to 2 ft.	106(60.9)	38(21.8)	9(5.2)	21(12.1)	174(58.0)	
	2 ft. to 3 ft.	17(41.5)	14(34.1)	7(17.1)	3(7.3)	41(13.7)	
	More than 3 ft.	2(25.0)	3(37.5)	1(12.5)	2(25.0)	8(2.7)	
<b>Total</b>		<b>166(53.33)</b>	<b>73(24.33)</b>	<b>25(8.33)</b>	<b>36(12.0)</b>	<b>300(100)</b>	

square test statistics shows that the p-value>0.05 at all cases under study hence

existing insignificant association on effect of physical health with respect to measured

<b>Table 3: Association of effect of mental health with socio-demographic characteristics</b>							
Socio-demographic characteristics	Categories	Effect on mental health				Total	p-value
		Negative effect	No effect	Did not care yet	Positive effect		
<b>Gender</b>							
	Female	8(18.6)	7(16.3)	2(4.7)	26(60.5)	43(14.3)	0.16
	Male	64(24.9)	73(28.4)	8(3.1)	112(43.6)	257(85.7)	
<b>Age</b>							
	20-34 years	22(20.6)	28(26.2)	6(5.6)	51(47.7)	107(35.7)	0.43
	35-44 years	42(27.6)	41(27.0)	4(2.6)	65(42.8)	152(50.7)	
	45-60 years	8(19.5)	11(26.8)	0(0.0)	22(53.7)	41(13.7)	
<b>Years of using mobile</b>							
	Before < 4 years	5(23.8)	5(23.8)	1(4.8)	10(47.6)	21(7.0)	0.14
	Before 4-8 years	21(19.6)	37(34.6)	6(5.6)	43(40.2)	107(35.7)	
	Before ≥ 8 years	46(26.7)	38(22.1)	3(1.7)	85(49.4)	172(57.3)	
<b>Years of using laptop</b>							
	Before < 4 years	20(19.8)	33(32.7)	2(2.0)	46(45.5)	101(33.7)	0.15
	Before 4-8 years	41(31.1)	28(21.2)	5(3.8)	58(43.9)	132(44.0)	
	Before ≥ 8 years	11(16.4)	19(28.4)	3(4.5)	34(50.7)	67(22.3)	
<b>Distance of digital devices</b>							
	Less than 1 ft.	23(29.9)	24(31.2)	3(3.9)	27(35.1)	77(25.7)	0.05*
	1 ft. to 2 ft.	37(21.3)	36(20.7)	5(2.9)	96(55.2)	174(58.0)	
	2 ft. to 3 ft.	10(24.4)	16(39.0)	2(4.9)	13(31.7)	41(13.7)	
	More than 3 ft.	2(25.0)	4(50.0)	0(0.0)	2(25.0)	8(2.7)	
<b>Total</b>		<b>72(24.0)</b>	<b>80(26.67)</b>	<b>10(3.33)</b>	<b>138(46.0)</b>	<b>300(100)</b>	

socio-demographic characteristics at 95% level of confidence interval.

Association of effect of mental health with socio-demographic characteristics is presented in table 3. Results, presented in Table 3, shows that around half (46.0%) of the participants have positive effect on mental health, whereas around one-fourth (24%) of them have negative effect and 3.3% did not care about the effect of using digital devices on their mental health. Frequency of respondent on negative effect having age 35-44 years (27.6%), male (24.9%), those using mobiles before greater than or equal to 8 years (26.7%), using laptop before 4-8 years (31.1%) and those using digital devices with the distance of less than 1 ft. (29.9%) are comparatively high in age, gender, years of using mobile, years of using laptop, and

distance of digital devices, respectively. Frequency on no effect found to be high among participants, who used digital devices from the distance more than 3 ft. (50%) in comparison to others. Similarly, Frequency of the positive effect is found to be comparatively higher among participants using mobile (49.7%) and laptop (50.7%) before more than or equal to 8 years, female (60.5%), having age 45-60 years (53.7%) and those using digital devices with the distance of 1 ft. to 2 ft. (55.2%) found to be high in composition to others. The findings as well as the 95% confidence interval of chi-square statistics are also shown in Table 3 and result shows that the significant association is measured in effect on mental health with respect to distance of using digital devices. However, insignificant associations are

measured with other remaining socio-demographic characteristics under study.

## DISCUSSION

This study was one of few to investigate competence of learning management system by use of digital resources and their impact on physical and mental health in Nepalese university students. The result indicated that majority of participants used digital resources for their academic activities and social connectivity as they mostly use their devices for social media, communication, information sharing, learning, entertainment and internet surfing. We observed majority (61.7%) participants have used their device in sitting positions which indicates their health consciousness about the long-term effect of digital devices. Similarly, participants also showed their positive attitude towards the preferred time of using devices, however a significant proportion preferred night and are likely to be more vulnerable to sleeping disorder and depression. Even, the percentage in our study is low than other similar kind of study [31-32]. The participants responses towards limited use of digital tools, use as per need only, use by making schedule, mediation, to take suggestion by the doctors, use without monotonous, appropriate breaks and comfortable body posture seem that they have good sense of knowledge and skill for the proper utilization of digital devices.

The result indicated that the use of digital device has negative effect on physical health like as headache, eye problems, back pain, neck pain and stiffness in fingers. In contrast to our study, many researchers have shown the significant impact of digital devices on personal health. Corroborating to the findings [21] in their research on 500 students, found that 53.3 % of the students had headache and

54.8 % had burning sensation in eyes. However, the age group in their study 17 to 30 was different than in our study. (Shan et al., 2013) from China also has similar result for neck pain and eye strain symptoms over the utilization of digital devices. A case study by Talwar [33] from India had similar finding regarding headache (29.2%), visual problems (eye strain) 76%, and musculoskeletal problems (strain on neck, back and hands/arms) were reported by 76.5%. Although, the other factors like age, gender, distance of device and duration of use are also the major affecting factors contributing health issues even the result shown in our study could not establish significant association.

The result is similar in case of mental health except in the case of one of socio-demographic variable i.e. distance of digital devices. It may be the cause that the participants of this research were digital literate and having high academic qualification. Our result about mental health perception also contrasted with other studies, where digital device played a significant role in their mental condition. Prince (2015) [34] found that rate of change of mental health problems is high among college and university students in USA and in other countries. However, our observations are limited to the university students and could not be extrapolated to the general public. This method currently considers only university scholars and needs further improvement in methodological approach.

## CONCLUSION

From the results we have drawn the conclusions that the use of digital resources has negative effect on physical health and positive effect on mental health. Use of such

resources with the distance greater than 3 ft. is better for health however the limited use of digital tools, use as per need only, use by making schedule, mediation, to take suggestion by the doctors, use without monotonous, appropriate breaks and comfortable body posture are major are the major techniques for the safe use of digital resources. Hence the findings suggest that all technology users should careful on safely use for their physical and mental health. Additionally, government and other related bodies should announce and advocate towards the effect of using technologies in public forum by newspaper, social media, radio and television program and such content should be integrate in school and university curriculum. This research is limited to only one university and only MPhil scholars hence further study should focus on all technology users with large sample size.

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