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Cyber Resource Usage and Cyber Crime Awareness among teachers in the making at Sikkim

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Abstract

The rapid digitalisation of education emphasises the critical need for educators to possess both favourable attitudes towards integrating cyber resources and cybercrime awareness. This study investigates pre-service teachers' attitudes towards using cyber resources and their cybercrime awareness in Sikkim. The need for technology integration in education necessitates that teachers possess both a positive attitude towards utilising cyber resources and awareness of potential cyber threats. The research studied the levels of attitude and awareness among Bachelor of Education (B.Ed.) students, based on gender, method paper, and college management (government/private). The results show that the majority of pre-service teachers hold a positive attitude towards using cyber resources. The study's results also depicted that most pre-service teachers had a high level of cybercrime awareness. Gender and method paper do not affect the attitude of pre-service teachers towards using cyber resources, while government pre-service teachers showed a significantly favourable attitude towards using cyber resources as compared to private pre-service teachers. There was no significant difference in cybercrime awareness with respect to gender and management; however significant difference was found in cybercrime awareness in relation to method paper adopted by the pre-service teachers.

Keywords: Pre-service teachers, attitude, cyber resources, cybercrime awareness, teacher education

Introduction

The use of ICT helps to access the desired information in a fraction of the time. The growth of modern society depends on the rapid changes and technological advances with the internet. The exploration of knowledge is crucial, as the present learning may not be useful in the next few years (Khan, 2018) [10].

In the present society of the 21st century, science has invented various technologies that are actively bringing social change. A computer is one of the technologies that can be observed in the areas of medical, education, management, and administration. Its use has revolutionized the educational field and practical knowledge that are essential. The rapid advancement of technology resulted in the emergence of computer phobia in most people (Suvera and Tailor, 2020) [24].

Technology like a computer, mobile phones, and the internet provides a significant impact in aspects like business, entertainment, and the educational field. These days everyone is familiar with the use of social sites and devices such as face book, twitter, computers, smartphones, and tablets. The development of the technology empowered the teaching methodology with new forms like MOOCs (Massive Open Online Courses. Computer and the internet has an important role in the dissemination of knowledge. In most educational institutions, several teachers are using computers and cyber resources in the educational process. It helps in the long-term retention process.

After China, India is the second largest online market in the world consisting of 560 million internet users. It may rise to 650 million users by 2023. As per the reports of crime records, bureau NCRD 27,248 cases of cyber-crime were reported in India in 2018. FBI reports state that India ranks third among the top 20cybercrimes victim. The National Cyber Crime Reporting Portal started in 2019 by the Ministry of Home Affairs received 33,152 complaints until now resulting in 790 FIRs. In 2017, the reports described that Indian Consumers loses over 18 billion US dollars due to cyber-crimes. The most popular cybercrimes were phishing frauds, identity theft defrauds, online harassment, cyberstalking, and invasion of privacy. The dynamic nature of the cyber-crime is the biggest challenge of the ongoing

advancement of digital technology (Narnolia, 2021) [14].
Recently two persons from Rajasthan in connection to the 2020 cybercrime case of an online gift card fraud were registered and arrested by CID Sikkim police (Ongmu, 2021) [15]. Multiple complaints of sextortion through social media were reported during the second wave of covid as per the cyber branch reports. Awareness is the essential element in order to be cautious (Times 8 web desk, 2021). A case was registered on 28 January 2022 that a man was defrauded an amount of rs.6, 93160 online on the pretext of installing a Jio tower on his land. The covid-19 pandemic made most people work from home through the internet, which attracted more cyber issues whether it may be for education, banking, and shopping. Cyber crime activities such as cloning Atm cards, identity theft, KYC frauds, crypto-jacking, drugs and illegal arms dark web, child pornography, online fraud job and lottery, social engineering, and cyber terrorism were reported due to the advancement of technology. The IT act 2000 amended several sections of the existing IPC, 1860,
the Indian Evidence Act, 1872, the Banker's Book Evidence Act, 1891, and the RBI Act, 1934 such that any cyber-related issues are booked under this law. Despite these, Acts India ranks top in targets of cyber-attacks among various countries. In 2013, the government of India under the National Cyber Security Policy (NCSP) recommended numerous strategies to counter cyber security threats but as of now limited implementation and a lack of comprehensive cyber security strategy have been followed (Rai, 2022).

Need of the study

Despite Sikkim's relatively low cybercrime rate and efforts towards digital literacy at the school level (especially during the pandemic), higher education has seen a gap in such initiatives. Teachers are key in promoting digital literacy and life skills.
Given the lack of research in Sikkim on pre-service teachers' attitudes and awareness towards digital content learning and cyber resources, this study aims to understand their perspectives to address potential issues and raise awareness in this crucial group.

Objectives of the study

1. To study the level of attitude towards using cyber resources among pre service teachers.
2. To study the level of cyber crime awareness among pre service teachers.
3. To find out the difference in attitude towards using cyber resources of pre service teachers with reference to:
   a. Gender.
   b. Method Paper
   c. Management
4. To find out the difference in cyber crime awareness of pre service teachers with reference to:
   a. Gender.
   b. Method Paper
   c. Management
5. To find the relationship between attitude towards using cyber resources and cyber crime awareness of pre service teachers of Sikkim.

Hypotheses

$H0_1$: There is no significant difference in the attitude towards using cyber resources of male and female pre service teachers.
$H0_2$: There is no significant difference in the attitude towards using cyber resources of pre service teachers with reference to method paper.
$H0_3$: There is no significant difference in the attitude towards using cyber resources of government and private college pre service teachers.
$H0_4$: There is no significant difference in cyber crime awareness of male and female pre service teachers.
$H0_5$: There is no significant difference in cyber crime awareness of pre service teachers with reference to method paper.
$H0_6$: There is no significant difference in cyber crime awareness of government and private college pre service teachers.
$H0_7$: There is no significant relationship between attitude towards using cyber resources and cyber crime awareness among pre service teachers.

Research Method

Employing a quantitative approach and a descriptive survey method, this research seeks to understand the attitudes, differences, and relationships of pre-service teachers in Sikkim regarding their use of cyber resources and their perceptions of cybercrime. The descriptive design allows for the examination of the present situation, relevant issues, and interconnections within the group, ultimately characterizing the study population.
The population for this study consisted of 328 B.Ed. pre-service teachers enrolled in government and private colleges within the state of Sikkim. The sample of respondents was drawn from the following institutions: Government B.Ed. College Soreng, Loyola College of Education (Namchi) and Harkamaya College of Education (Gangtok).
A sample of 150 second-year pre-service teachers affiliated with Sikkim University was selected for this research. This sample included 71 respondents from Government B.Ed. College, Soreng, 38 respondents from Harkamaya College of Education, Gangtok, and 41 respondents from Loyola College of Education, Namchi. Stratified random sampling was utilized to select the study sample. Data will be gathered from 150 pre-service teachers across the three B.Ed. colleges, with stratification based on gender, management type, and teaching methods.

Tools used for Data Collection

In this study, the researcher employed two standardized instruments: the "Attitude towards using cyber resource scale" developed by Rajasekar in 2010, and the "Cyber Crime awareness scale," constructed by Rajasekar in 2011.

Results

Objective 1: To study the level of attitude towards using cyber resources among pre service teachers of Sikkim.

Table 1: Frequency and percentage are used to analyse the data in order to understand the level of Attitude towards using cyber resources among Pre-Service Teachers of Sikkim.

Raw Score Range	Grade	Frequency	Percentage	Level of Attitude Towards using Cyber Resources
97 & above	A	21	14	Extremely High
89 to 96	B	67	45	High
81 to 88	C	55	37	Above Average
70 to 80	D	7	5	Average
62 to 69	E	-	-	Below Average
54 to 61	F	-	-	Low
53 & below	G	-	-	Extremely Low

***Source*:** Field Survey

As per the data, received Table 1 shows that 14% pre service teachers have extremely high attitudes towards cyber resources in the 97 & above range. Moreover, 45% obtained a high- level attitude towards cyber resources in the 89 to 96 range. Almost 37% of them obtained in the range 81 to 88 on above average level, the second highest level. Further, 5% of them have an average attitude towards using cyber resources in the 70 to 80 range. Therefore, none of pre service teachers has been identified in the range 62 to 69, 54 to 61 as well as 53 & below, which indicate all the pre service teachers have average to above average attitude towards using cyber resources. The data shows that majority of pre-service teachers in Sikkim hold positive attitudes towards using cyber resources.

Objective 2: To study the level of cyber crime awareness among pre service teachers of Sikkim.

Table 2: Frequency and percentage are used to analyse the data in order to understand the level of Attitude towards cyber crime awareness among Pre-Service Teachers of Sikkim

Raw score range	Grade	Frequency	Percentage	Cybercrime Awareness Scale
143 & above	A	105	70	Excellent Awareness
133-142	B	30	20	High Awareness
123-132	C	9	6	Above Average Awareness
108-122	D	6	4	Moderate Average Awareness
99-107	E	-	-	Below Average Awareness
88-98	F	-	-	Low Awareness

***Source*:** Field Survey

Table 2 revealed that 70% of them are having Excellent Awareness of cyber crimes in the 143 & above range. 20% of them have been identified as having high Awareness of cybercrimes 133 to 142 range. Around 6% of them are having Above Average Awareness of cyber-crimes. Only 4%of they are having moderate average awareness. None of them was identified in the range 99 to 107 and 88 to 98. The data shows that the majority of pre-service teachers in Sikkim, possess a generally high level of attitude towards cybercrime awareness.

Objective 3

To find out the difference in the attitude towards using cyber resources of pre service teacher with reference to

Gender

$H0_1$: There is no significant difference between the attitude of male and female pre service teachers towards using cyber resources

Table 3: Results of t-Test examining the difference in the Attitude towards using Cyber Resources of Male and Female Pre-Service Teachers.

Gender	N	M	SD	t (148)	p	Remarks
Male	57	90.33	6.97	0.079	0.9	not significant at 0.05 level
Female	93	90.25	6.14			

***Source*:** Field Survey

From the above table 3, the mean score and SD on attitude towards cyber resources of male pre service teachers were found (M=90.33, S.D. =6.97) while, the mean score and SD on attitude towards cyber resources of female pre service teachers were found (M=90.25, S.D. =6.14). Thus, both male and female pre service teachers have similar attitudes towards cyber resources. The results of an independent samples t-test ($t(148) = 0.079$, $p > 0.05$) revealed that male and female pre-service teachers have a similar attitude towards the use of cyber resources. The failure to reject the null hypothesis confirms that gender does not appear to be a significant factor influencing these attitudes within this group.

Objective 3: To find out the difference in the attitude towards using cyber resources of pre service teacher with reference to

Method Paper

$H0_2$: There is no significant difference in the attitude towards using cyber resources of pre service teachers with reference to method paper.

Table 4: Results of one-way ANOVA Examining the difference in the Attitude towards using Cyber Resources of Pre-Service Teachers with reference to Method papers

Variable	English (1)		Social Science (2)		Mathematics (3)		Science (4)		F (3, 146)	P
	M	SD	M	SD	M	SD	M	SD		
Attitude Towards Cyber Resources	88.89	4.74	89.42	6.98	92.05	5.67	91.81	6.64	2.075	0.11

***Source*:** Field Survey

In the above table 4 it is revealed that the mean score of English method pre service teachers is 88.89 and standard deviation is 4.742. The mean score of Social Science method paper pre service teachers is 89.42 and standard deviation is 6.984. Similarly, the mean score of Mathematics and Science method paper is 92.048 and 91.81, standard deviation is 5.669 and 6.641 respectively. All four groups of pre-service teachers, regardless of their method paper, demonstrate a generally positive attitude towards using cyber resources. Mathematics method paper pre-service teachers show the most positive attitude as compared to the mean scores of Social Science, Science and English.

From Table 4, it can be found that 'F' value and 'p' Value obtained is 2.075 and 0.11 respectively. The p-value is greater than 0.05, indicating that there is no significant difference in the attitude towards cyber resources of pre service teachers with reference to method papers. Thus, the null hypothesis "There is no significant difference in the attitude towards using cyber resources of pre service teachers with reference to method papers" is failed to be rejected. The study concludes that the method paper of pre-service teachers does not have a statistically significant impact on their attitude towards using cyber resources. All groups of pre-service teachers, regardless of their method paper, appear to have a similar attitude towards utilizing cyber resources.

Objective 3: To find out the difference in the attitude towards cyber resources of pre service teachers with regard to

Management

$H0_3$: There is no significant difference between the attitude of government and private pre service teacher towards using cyber resources.

Table 5: Results of t-Test examining the difference in the Attitude towards using Cyber Resources of Government and Private Pre-Service Teachers.

Management	N	M	SD	t (148)	P	remarks
Government	71	91.59	6.55	2.4	0.02	significant at 0.05 level
Private	79	89.1	6.17			

***Source*:** Field Survey

From the above table 5, the mean score and SD on attitude towards using cyber resources of government pre service teachers were found (M=91.59, S.D. =6.55) while, the mean score and SD on attitude towards cyber resources of private pre service teachers were found (M=89.10, S.D. =6.17). The mean scores towards using cyber resources are more favorable among government pre service teachers.

Table 5 provides the comparison between the attitude of government and private pre service teachers towards cyber resources. The results of the independent sample two-tailed *t*-test revealed that the value of t (148) = 2.4, p=0.02 <0.05, indicates that government and private pre service teachers vary in their attitude towards cyber resources. Thus, the null hypothesis "There is no significant difference between the attitude of the government and private pre service teacher towards using cyber resources" was rejected. This indicates that government pre service teachers have a significantly favourable attitude towards using cyber resources as compared to private pre service teachers.

Objective 4: To find out the difference in cyber crime awareness of pre service teacher with reference to

Gender

$H0_4$: There is no significant difference in cyber crime awareness between male and female pre service teachers.

Table 6: Results of t-Test examining the difference in Cyber Crime Awareness of Male and Female Pre Service Teachers.

Gender	N	M	SD	t (148)	p	remarks
Male	57	148.561	14.63	0.35	0.73	not significant at 0.05 level
Female	93	147.796	11.92			

***Source*:** Field Survey

From the above table 6, the mean score and SD on cyber crime awareness of male pre service teachers were found (M=147.79, S.D. =11.92) while, the mean score and SD on cyber crime awareness of female pre service teachers were found (M=148.56, S.D. =14.62). Thus, the mean scores of male and female pre service teachers favor cybercrime awareness.

Table 6 provides a comparison between the attitude of male and female pre service teachers towards cyber resources. The results of the independent sample two-tailed t-test revealed that the value of t (148) = 0.35, p =0.73 >0.05, indicates that male and female pre service teachers did not vary in their attitude towards cyber crime awareness. The null hypothesis "There is no significant difference between the attitude of male and female pre service teachers towards cyber resources" failed to be rejected. Thus, both groups exhibit similar levels of awareness regarding cyber crime.

Objective 4: To study the difference in the cyber crime awareness of pre service teachers with reference to

Method Paper

$H0_5$: There is no significant difference in cyber crime awareness of pre service teachers with reference to method paper.

Table 7: Results of one-way ANOVA examining the difference in Cyber Crime Awareness of Pre Service Teachers with reference to Method paper.

Variable	English (1)		Social Science (2)		Mathematics (3)		Science (4)		F (3, 146)	P
	M	SD	M	SD	M	SD	M	SD	3.49	0.017*
Cyber Crime Awareness	148.18	12.99	144.6	12.83	152.81	11.5	151.45	12.69		

***Source*:** Field Survey

Note: *Significant at 0.05 level

In the above table 7, it is revealed that the mean score of English method paper pre service teachers is 148.18, and the standard deviation is 12.99. This indicates that, on average, pre-service teachers in the English method group demonstrate a certain level of awareness regarding cyber crime. The mean score of Social Science method paper pre service teachers is 144.6 and the standard deviation is 12.83. This group has the largest sample size and shows a slightly lower average awareness. Similarly, the mean score of the Mathematics and Science method papers is 152.81 and 151.45. This suggests that, on average, pre-service teachers in the mathematics method group possess a relatively higher level of cyber crime awareness. The Science method paper group (N=37) has a mean cyber crime awareness score of 151.45 with a standard deviation of 12.69. This group also demonstrates a relatively high average awareness, slightly lower than the Mathematics group but higher than the English and Social Science groups. From Table 7 it can be found that the results of one-way ANOVA indicate that there is a statistically significant difference in the cyber crime awareness levels among pre-service teachers based on their chosen method paper [F (3, 146) = 3.49, p = 0.017]. Since the p-value (0.017) is less than the significance level of 0.05, the null hypothesis is rejected. This signifies that the method paper adopted by pre-service teachers (English, Social Science, Mathematics, or Science) has a significant effect on their cyber crime awareness. As the result is found to be significant, Tukey's High Significant Difference (HSD) post-hoc test for Multiple Comparisons was performed in order to understand the inter-group differences. The result of Tukey's Test for Multiple Comparisons is embedded in the following table.

Table 8: Multiple Comparison of Pre Service Teachers with respect to Method papers based on Results of Tukey's High Significant Difference (HSD) post-hoc Test

Method paper	Method paper	Mean Difference	*p*-value
English	Social Science	3.59	0.61
English	Mathematics	-4.62	0.59
English	Science	-3.27	0.73
Social Science	Mathematics	-8.21	0.05*
Social Science	Science	-6.85	0.05*
Mathematics	Science	1.35	0.98

***Source*:** Field survey *$p<0.05$

Table 8 reveals that the multiple comparisons of the cyber crime awareness of pre service teachers belong to their method papers. Of all the categories the mean value of cyber crime awareness was significantly different among the pre service teachers who have social Science and Mathematics method papers (p=0.05). The comparisons also revealed that there was a statistically significant difference in the mean value of cyber crime awareness between the teachers who have the Social Science and Science method papers (p=0.05). There was no statistically significant difference in the mean value of cyber crime awareness among the pre service teachers who have English and Social Science, English, and Mathematics, and English and Science respectively (p=0.6, p=0.6, p=0.7). Similarly, there was no statistically significant difference in the mean value of cyber crime awareness among the pre service teachers who have Mathematics and Science method papers (p=0.9).

Objective 4: To find out the difference in cyber crime awareness of pre service teachers with reference to-

Management

$H0_6$: There is no significant difference between the attitude of the government and private pre service teachers towards cybercrime awareness

Table 9: Results of t-test examining the difference in Cyber Crime Awareness of Government and Private Pre Service Teachers.

Management	N	M	SD	t (148)	p	remarks
Government	71	150.04	9.983	1.763	0.08	not significant at 0.05 level
Private	79	146.33	15.013			

***Source*:** Field survey

From the above table 9, the mean score and SD on cyber crime awareness of government pre service teachers were found (M=150.04, S.D. =9.983) while, the mean score and SD on cyber crime awareness of private pre service teachers were found (M=146.33, S.D. =15.013). This shows that both groups demonstrate a relatively high mean score on cyber crime awareness.

Table 9 provides the comparison between the attitude of government and private pre service teachers towards cyber resources. The results of the independent sample two-tailed *t*-test revealed that the value of t (148) = 1.763, p=0.08 >0.05, indicates that male and female pre service teachers did not vary in their attitude towards cyber crime awareness. The null hypothesis "There is no significant difference between the attitude of male and female pre service teacher towards cyber resources" is fail to be rejected. The findings suggest that the government and private institution pre-service teacher has similar cyber crime awareness.

Objective 5: To find the relationship between attitude towards using cyber resources and cyber crime awareness among pre service teachers of Sikkim

Table 10: Correlation between Attitude towards using Cyber Resources and cyber crime awareness of pre service teachers of Sikkim

Correlations		
	Attitude Towards Using Cyber Resources	Cyber Crime Awareness
	1	.317
Sig. (2-tailed)		.000
N	150	150

***Source*:** Field Survey

Note: *correlation at 0.05 level (2-tailed)

The correlation analysis indicates a statistically significant and positive relationship between pre- service teachers' attitude towards using cyber resources and their awareness of cyber crime (r = 0.317, p<0.01, 0.05). This significance level allows us to reject the null hypothesis.

Specifically, the positive correlation suggests that, on average, as pre-service teachers hold a more favorable attitude towards utilizing cyber resources, their awareness of cyber crime tends to be higher. However, it is important to note that the strength of this correlation is moderate (r = 0.317). This highlights that a positive attitude towards technology is associated with greater cyber crime awareness.

Suggestions

1. Private institutions should proactively organize webinars and seminars to enhance pre- service teachers' understanding of cyber resources and raise awareness about cybercrime.
2. For more clarity Cybercrime awareness papers should be introduced in the pre-service teacher education programs.

Conclusion

The study on pre-service teachers in Sikkim reveals a generally positive landscape regarding their engagement with and understanding of the cyber world. The majority of pre-service teachers demonstrate a positive attitude towards using cyber resources and possess a high level of cybercrime awareness. Gender does not appear to be a significant factor influencing either the attitude towards using cyber resources or the level of cybercrime awareness among pre-service teachers in Sikkim.

While the attitude towards using cyber resources is similar across different method papers, cybercrime awareness varies significantly. Specifically, pre-service teachers specializing in Social Science exhibit lower cybercrime awareness compared to those in Mathematics and Science. A significant difference exists in the attitude towards using cyber resources based on the institution's management. Government pre-service teachers demonstrate a more positive attitude towards utilizing cyber resources compared to their counterparts in private institutions. However, there is no significant difference in cybercrime awareness between pre-service teachers from government and private institutions. A significant and positive correlation exists between the attitude towards using cyber resources and cybercrime awareness. This suggests that pre-service teachers who are more inclined to use cyber resources also tend to be more aware of the potential cyber threats.

Ultimately, pre-service teachers in Sikkim are generally positive and aware in the cyber domain, targeted interventions might be beneficial to enhance cybercrime awareness among specific groups, particularly those specializing in Social Science. Additionally, exploring the factors contributing to the more positive attitude towards cyber resources among government institution pre-service teachers could provide valuable insights for teacher training programs across different management types. The positive correlation between attitude and awareness underscores the importance of fostering a positive engagement with technology while simultaneously promoting critical awareness of cybersecurity issues among future educators.

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