10-2020

EXPLORING THE USAGE PATTERN OF SMARTPHONE FOR ACADEMIC PURSUIT: A CASE STUDY OF UTKAL UNIVERSITY

Satyajit Nayak
RCSIR-Central Road Research Institute, New Delhi, satyajitnayak555@gmail.com

Kunwar Singh
Banaras Hindu University, Varanasi, singhdlisbhu2015@gmail.com

Ramesh Kuri
Rani Channamma University, Belagavi, rameshkuri.rcu@gmail.com

Abhimanyu Pradhan
Berhampur University, Berhampur, abhilisuu@gmail.com

Dillip Kumar Parida
Indian Institute of Technology Bhubaneswar, Odisha, dillipimmt@gmail.com

See next page for additional authors

Authors
Satyajit Nayak, Kunwar Singh, Ramesh Kuri, Abhimanyu Pradhan, Dillip Kumar Parida, and Madan Singh

EXPLORING THE USAGE PATTERN OF SMARTPHONE FOR ACADEMIC PURSUIT: A CASE STUDY OF UTKAL UNIVERSITY

Satyajit Nayak[a] Kunwar Singh[b] Ramesh Kuri[c] Abhimanyu Pradhan[d] Dillip Kumar Parida[e] Madan Singh[f]

Abstract

This paper aims to determine the usage patterns of smartphones by Utkal University students for their academic pursuits. This study uses a survey method to collect data from students at Utkal University. A total of 250 questionnaires were distributed, and 215 duly filled questionnaires were received, with the response rate of 86%. The students expressed that they used smartphones for both general purposes as well as academic purposes. The main aim of this paper is to throw light on how students are using smartphones for their academic purposes without prior training. The study found that 90% of the respondents indicated that smartphones help to store course materials for easy access and to check email inbox often. This study recommends that the University committed itself to promote the use of smartphones in teaching and learning at different levels. To encourage the use of smartphones, it is necessary to periodically develop a standardized training program for better use of smartphones.

Keywords: *Smartphone, Academic apps, Students, Usage Pattern, Utkal University, ICT*

---

[a] Technical Assistant, (Documentation & Library Services), CSIR-Central Road Research Institute, Delhi-Mathura Road, New Delhi-110025, satyajitnayak555@gmail.com

[b] Assistant Professor, Department of Library & Information Science, Banaras Hindu University, Varanasi-221005, Uttar Pradesh, singhdlisbhu2015@gmail.com

[c] Assistant Professor, Department of Library & Information Science, Rani Channamma University, Belagavi-591156, Karnataka, rameshkuri.rcu@gmail.com

[d] Assistant Librarian, Berhampur University, Berhampur-760007, Odisha, abhilisuu@gmail.com

[e] Senior Library & Information Assistant, Indian Institute of Technology Bhubaneswar, Odisha, dillipimmt@gmail.com

[f] Department of Library & Information Science, Banaras Hindu University, Varanasi-221005, Uttar Pradesh, madanrawatgeit@gmail.com

1. INTRODUCTION

In the system of higher education, Information, and Communication Technology (ICT) has changed the way of teaching and learning. In the current academic practices ICT is becoming an ideal medium for preparing the students for the future. The recent mobile technology has created a new identity in the modern age of ICT, and forcing students to work on campus for decades. (Elkington and Bligh) Mobile technology is becoming an essential tool using it for communication, recreational, business, academic and many other purposes. The mobile technology has upgraded from a phone call and messaging into a multitasking device used for internet browsing, gaming, and instant messaging tools. (Macwan, 2017) Further, it has made it possible for academicians to transfer their files through Bluetooth and Wi-Fi, video call conferencing, and many more. The term m-learning originated due to the advancement of information and communication technology. It has opened the door to the students to acquire their learning materials anywhere and anytime using mobile technologies and the internet. Learning through Mobile is depending upon the learner's interests, experiences, and needs. (Caballe, Barolli, & Xhafa, 2014)

2. REVIEW OF LITERATURE

Baert et al. (2020) measured impact of smartphone use on educational performance. The authors combined data from a survey on the general use of smartphones, external forecasts for its use, and estimates for the first year in two Belgian universities and other success factors. The data were analyzed with instrumental variable estimation techniques. The findings of the study indicated that the negative association between smartphone use and exam results is more outspoken for students (i) with highly educated fathers, (ii) with divorced parents, and (iii) who are in good health. It was suggested that the policy-makers should invest in information awareness campaigns of teachers and parents to highlight this trade-off between smartphone use and academic performance. Amez & Baert (2020) conducted a systematic review of literature on smartphone use and academic success. The authors synthesize the theoretical mechanisms, empirical approaches, and empirical findings described in the multidisciplinary literature to date. The findings revealed that a predominance of empirical outcomes supporting a negative

association between students' frequency of smartphone use and their academic success. Nevertheless, the strength of this association is heterogeneous by (a) the tactic of knowledge gathering, (b) the measures of educational performance utilized in the analysis, and (c) the measures of smartphone use adopted. Ahmed et al. (2020) examined the influence of smartphones on university students' performance in Pakistan. In this study, the authors explore the functions of smartphones as exogenous predictors, such as smartphone applications, multimedia messaging service (MMS), short message service (SMS), processing speed, and entertainment in student achievement. The authors have collected 684 responses from seven universities in Pakistan and employed the SEM-based multivariate approach to analyze the data. The study results showed that analyzes affect student performance, variables of moderation, and meditation also significantly affect exogenous and endogenous variables. Han & Yi (2019) investigated the effects of smartphone use by college students on their perceived academic performance. The results showed that each one path coefficient was positive and statistically significant, which indicated that each one of the five hypothesized paths was supported. The analysis of several groups showed that the only path (from behavioral behavior to smartphone use to performance) differed significantly between groups. The authors suggest that this study will help decision-makers and educators know how the use of a smartphone in learning activities affects student performance. Zhao et al. (2018) reported that the use of smartphones for socializing and learning had become a norm among students in Singapore. The authors expressed that educational institutions are creating lessons and applications for use on mobile platforms. The authors have stated that the effectiveness of smartphones for learning has not been well studied in Singapore. In this study, the authors developed an understanding of the relationship between the use of smartphones for teaching a sample of higher education students in Singaporean activities and academic performance (measured by cumulative GPA) in a sample of higher education students in Singapore. The results of the study showed that the use of smartphones in learning activities was significantly associated with the average cumulative grade point average (cGPA) ($p < 0.05$). The findings also indicated by concluding that students who used smartphones for learning had higher academic performance (cGPA). Ng et al. (2017) drew attention to the extent to which students at Malaysian universities use smartphones to support their education and how this activity relates to the CGPA. In the study, 176 students from three science programs recorded daily use of smartphones for learning. The results showed that there

was a significant difference in smartphones that had academic programs. Further, it was found that the various students utilized their smartphone for university learning activities, the lower their CGPA. The study's findings suggest a requirement to engage, and better use smartphones for tertiary students. Yi, You, and Bae (2016**)** learn about the impact on students 'use of smartphones for learning and identify the need to change the way smartphones are used (TTF). The authors applied academic models to describe how TTF smartphones affect students' perceptions of smartphone use and learning. The study used a partial method of least squares path modeling to gauge the measurement model, and therefore the bootstrapping technique checks the importance of the hypotheses. The study results emphasize that smartphone assets can directly impact students' perception of the effects on performance and indirect effects on smartphone use on previous users, such as attitudes towards smartphone use, social norms, and conditions. Finally, the authors suggested that motivate them to use mobile technologies for their academic activities.

3. OBJECTIVES OF THE STUDY

The research study aims to identify the following objectives:

1. To identify how many students have smartphone and time spend on it per day;
2. To find the general purpose of using a smartphone and also most commonly used apps;
3. To know the awareness and extent of use of different educational apps;
4. To know the factors influenced to know about educational apps;
5. To identify the use pattern of educational apps for different academic activities, and
6. To suggest the best educational apps for students' academic benefits.

4. METHODOLOGY

In this study, the researchers adopted a descriptive survey method. The questionnaire tool was designed to collect relevant data to meet survey objectives. In this study, students of Utkal University were taken as a population. A total of 250 students were randomly chosen as respondents. The questionnaire was administered in the corresponding Department as well as in the hostel. During the distribution of the questionnaire, the researchers convinced the

respondents and confirmed that the answers would keep confidential and use for scientific purposes only. Out of 250 questionnaires, in return, 215 (86%) filled up questionnaires were found suitable for the analysis. After data collection, it was entered into the MS-Excel spreadsheet. Finally, the researchers analyzed the data based on simple tables, frequency, and percentage. The results are presented in the form of tables.

5. RESULTS AND DISCUSSION

5.1 Demographic profile

Table 1: Demographic profile of smartphone users

Sl. No	Variable	Classification	Frequency	%
1	Academic Level	Post Graduate	172	80.00
		M.Phil. Scholar	28	13.02
		Ph.D. Scholar	15	6.97
2	Gender	Male	144	66.98
		Female	71	33.02
3	Age	20-25	176	81.86
		26-30	18	8.37
		31-35	21	9.77

Table 1 shows the respondents' demographic profile, at the academic level, postgraduate students 172 (80%) followed by M.Phil. students 28 (13.02%), and Ph.D. Scholar 15 (6.97%). Gender-wise respondents are concerned male 144 (66.98%), and female 71 (33.02%). The age range of respondents ranged from 20 to 25 years (176.86%), followed by 31-35, 21 (9.77%), and 26-30, 18 (8.37%).

5.2 Availability of smartphone

Table 2: Smartphone availability

Sl. No.	Smartphone	Frequency	%
1	Yes	215	100.00
2	No	00	0.00
	Total	215	100.00

Table 2 reveals whether respondents have smartphones or not. It revealed that all 215 (100%) of respondents have smartphones.

5.3 Time spend on smartphone

Table 3: Time spend on smartphone

Sl. No.	Time spend	Frequency	%
1	1 hour a day	27	12.54
2	2 hour a day	38	17.66
3	3 hour a day	55	25.58
4	4 hour a day	53	24.65
5	5 hour a day	17	7.90
6	> than five hours	25	11.67
	Total	215	100.00

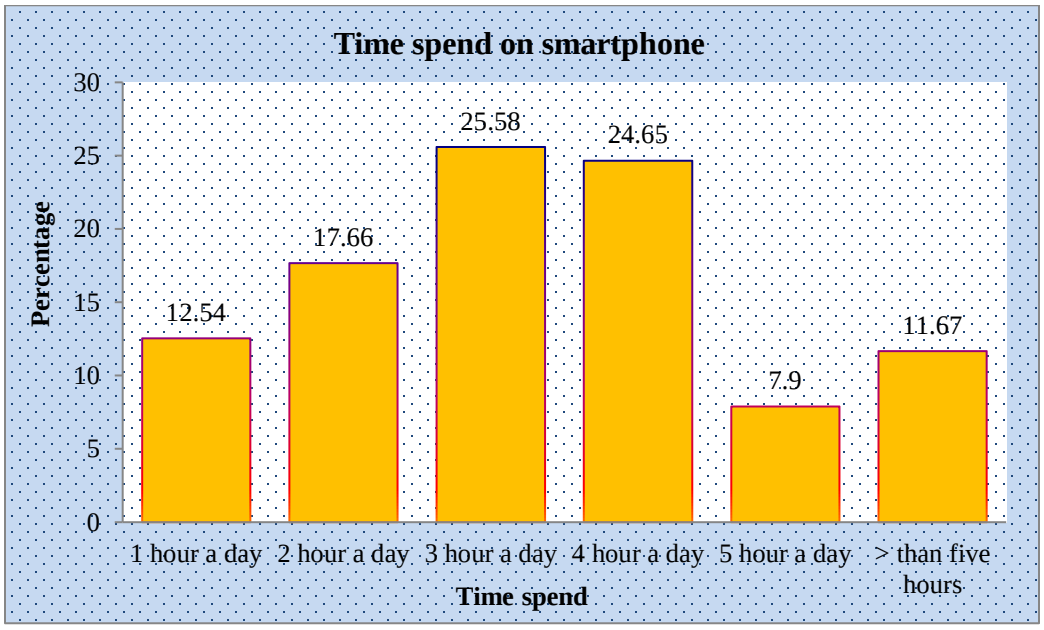

Figure 1 Time spend on smartphone

Table 3 and fig 1 shows the time spend in making use of smartphones per day. It revealed that the majority of respondents 55 (25.58%) indicated 3 hours a day followed by 4 hours 53 (24.65%), 2 hours 38 (17.66%), 1 hour 27 (12.54%), and 5 hours 17 (7.90%). It is clear from the

study that, as much as respondents spend minimum 3 to 4 hours, whereas a few respondents spend five hours.

5.4 General purposes of using a smartphone

Table 4: General purpose of using a smartphone

Sl. No.	Purposes	Frequency	%
1	Making phone calls	191	88.84
2	Email	174	80.93
3	Social media for better communication	160	74.42
4	Mobile/Internet banking	122	56.74
5	Taking pictures/Selfie	152	70.70
6	Voice Recording/video capturing	44	20.47
7	Uploading text, pictures, and movies	46	21.40
8	Editing pictures and movies	35	16.28
9	Drawings	27	12.56
10	Send text messages	143	66.51
11	Downloading required information	105	48.84
12	Watching movies and listening to music	138	64.19
13	Watching TV/News channels	107	49.77

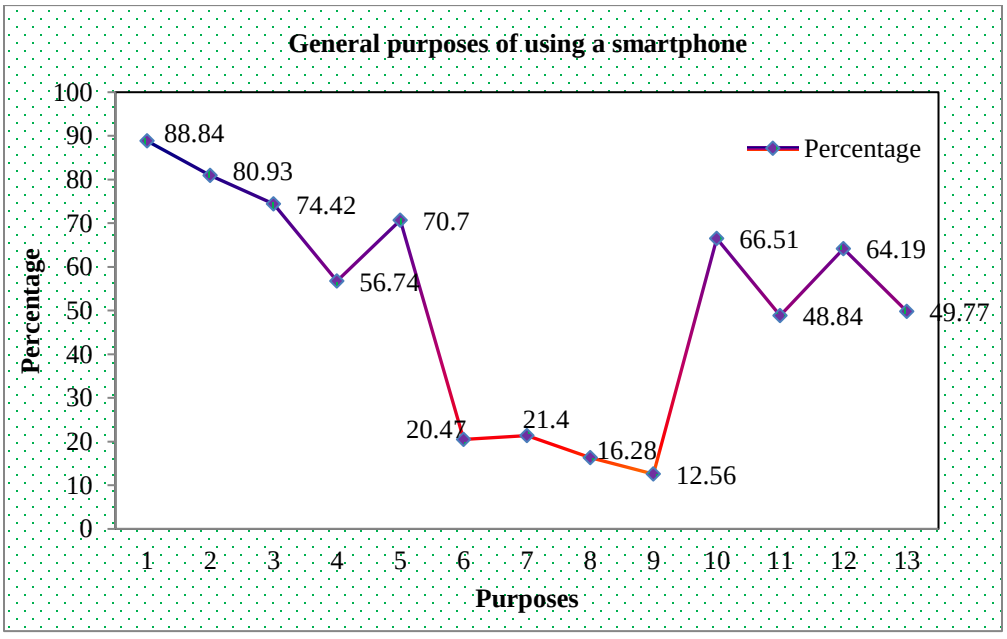

Figure 2 General purposes of using a smartphone

Table 4 and fig 2 depicts the use of smartphones for various purposes. The majority of respondents indicated that making phone calls 191 (88.84%) followed by Email 174 (80.93%) and Use of Social media for better communication 160 74.42%). Whereas, Taking pictures and browsing internet 152 (70.70%) each, Send text messages 143 (866.51%), Watching movies and listening music 138 (64.19%), Mobile banking 122 (56.74%), Watching TV/News channels 107 (49.77%), Downloading required information 105 (48.84%), Uploading text, images, and movies 46 (21.40%), Voice Recording/Video capturing 44 (20.40%), Editing pictures and movies 35 (16.28%), and Drawings 27 (1.66%).

5.5 Most commonly used apps

Table 5: Most commonly used apps

Sl. No.	Apps	Frequency (N=215)	%
1	Utility apps	137	63.72
2	Social networking apps	151	70.23
3	Health and fitness apps	66	30.70
4	Game apps	73	33.95
5	Search tool apps	93	43.26
6	Entertainment apps	120	55.81
7	News apps	163	75.81
8	Travel & stay apps	65	30.23
9	Banking apps	94	43.72

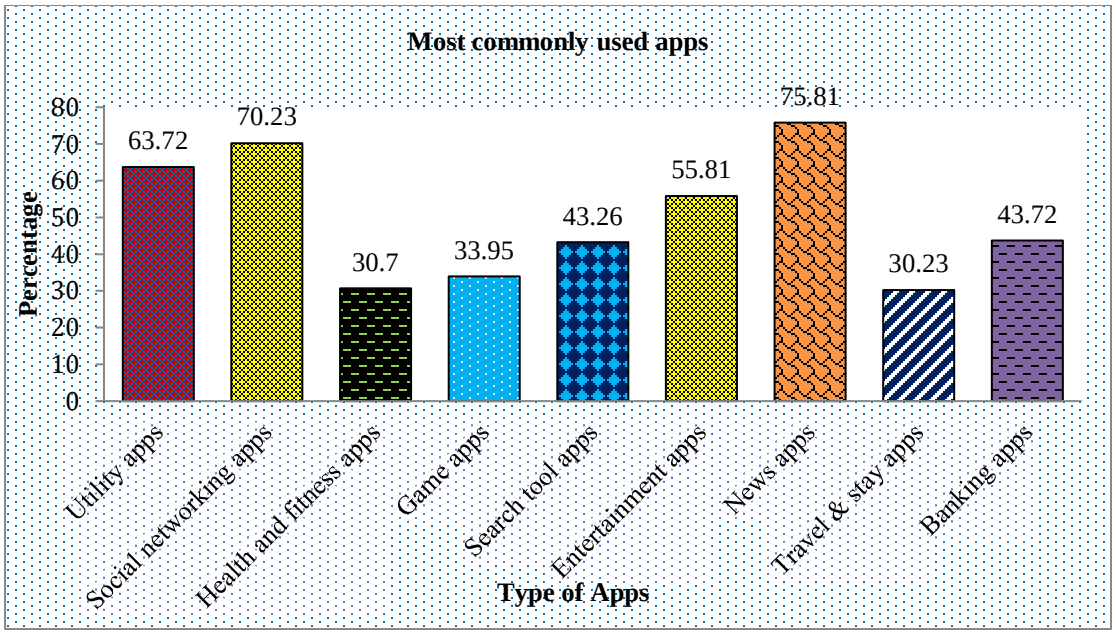

Figure 3 Most commonly used apps

Respondents were asked to indicate on the most commonly use apps. It is clear from the table 5 and fig 3 that News apps 163 (75.81%) followed by social networking apps 151 (70.23%), Utility apps 137 (63.72%), Entertainments apps 120 (55.81%), Banking apps 94 (43.72%), Search tool apps 93 (43.26%), Game apps 73 (33.95%), Health and fitness apps 66 (30.70%) and Travel apps 65 (30.23%). It is clear from the study that the majority of respondents use News apps followed by social networking apps and Utility apps. Whereas the least used apps are Travel and stay, and game apps.

5.6 Awareness and extent of use of educational apps

Table 6: Awareness and extent of use of educational apps

Sl. No.	Applications	Awareness and extent of use of educational apps					
		Aware (%)	Unaware (%)	Total (%)	Always (%)	Sometimes (%)	Rarely (%)
1	National Digital Library of India	94 (43.72)	121 (56.28)	125 (100)	8 (3.72)	30 (13.95)	56 (26.05)
2	SWAYAM	103 (47.91)	112 (52.09)	125 (100)	35 (16.28)	27 (12.56)	41 (19.07)
3	IGNOU e-Content	101	114	125	28	42	31

		(46.98)	(53.02)	(100)	(13.02)	(19.53)	(14.42)
4	eSkill India eLearning Aggregator from NSDC	27 (12.56)	188 (87.44)	125 (100)	4 (1.86)	8 (3.72)	15 (6.98)
5	National Career Service (NSC)	20 (9.3)	195 (90.7)	125 (100)	1 (0.47)	5 (2.33)	14 (6.51)
6	e-Pathshala	90 (41.86)	125 (58.14)	125 (100)	21 (9.77)	30 (13.95)	39 (18.14)
7	e-Granthalaya	25 (11.63)	190 (88.37)	125 (100)	3 (1.4)	6 (2.79)	16 (7.44)
8	Zoom	130 (60.47)	85 (39.53)	125 (100)	70 (32.56)	49 (22.79)	17 (7.91)
9	Youtube	180 (83.72)	35 (16.28)	125 (100)	98 (45.58)	47 (21.86)	35 (16.28)
10	Slideshare	164 (77)	49 (23)	125 (100)	46 (21.6)	88 (41.31)	30 (14.08)
11	NCERT Books	41 (19.07)	174 (80.93)	125 (100)	12 (5.58)	11 (5.12)	20 (9.3)
12	Khan Academy	50 (23.26)	165 (76.74)	125 (100)	22 (10.23)	21 (9.77)	7 (3.26)
13	Google classroom	108 (50.23)	107 (49.77)	125 (100)	55 (25.58)	31 (14.42)	22 (10.23)
14	Dictionary	204 (94.88)	11 (5.12)	125 (100)	117 (54.42)	54 (25.12)	33 (15.35)
15	Wikipedia	161 (74.88)	54 (25.12)	125 (100)	110 (51.16)	28 (13.02)	23 (10.7)
16	Webex Meet	154 (71.63)	61 (28.37)	125 (100)	42 (19.53)	57 (26.51)	55 (25.58)
17	Google Drive	200 (93.02)	15 (6.98)	125 (100)	89 (41.4)	65 (30.23)	46 (21.4)

* The data related to the extent of use of educational apps, were tabulated by ‘n’ value of each apps

The above table 6 throws light on the awareness and extent of use of various educational applications. A list of mobile applications (Educational) was given to the respondents to indicate awareness and most often use applications. The data shows that in terms of "knowledge" of educational applications, there are 215 majorities, i.e., 204 (94.88%), who were interviewed, knowing the use in the dictionary, followed by Google Drive 200 (93.04%), YouTube 180 (83.72%), slide share 164 (77%), Wikipedia 161 (74.88%), WebEx Meet 154 (71.63%) and

Zoom 130 (60.47%). Whereas an average number of respondents aware of NSDL, SWAYAM, IGNOU e-Content, and e-Pathshala, applications, Further majority number of respondents are unaware of other academic apps like National Career Service (NSC), e-Skill India e-learning aggregator from NSDC, e-Granthalaya, Khan Academy, and Google Classroom. The table also reveals the extent of the use of educational apps. As far as 'Always' use apps are concerned out of 215, majority i.e. 117 (54.42%) of respondents indicated Dictionary apps, followed by Wikipedia 110 (51.16%), YouTube 98 (45.58%), Google drive 89 (41.42%), Zoom 70 (32.56%) and Google Classroom 55 (25.58%). 'Sometimes' using apps are concerned majority i.e. 88 (41.31%) Slideshare followed by WebEx Meet 89 (41.41%) and IGNOU e-Content 42 (19.07%). Further NSDL, SWAYAM, NSC, e-Pathshala are the most 'Rarely' used apps. We can conclude that most respondents are unfamiliar and rarely use the course core contents mobile applications launched by the central government, such as NSDL, NSC, and e-Pathshala.

5.7 Persons influenced to know about the educational mobile application

Table 7: Persons influenced to know about the educational mobile application

Sl. No	Factors	Frequency (N=215)	%
1	By friends	181	84.19
2	By teachers	117	54.42
3	By self-learning	142	66.05
4	By library authority	99	46.05
5	By family friends	44	20.47
6	Others	7	3.27

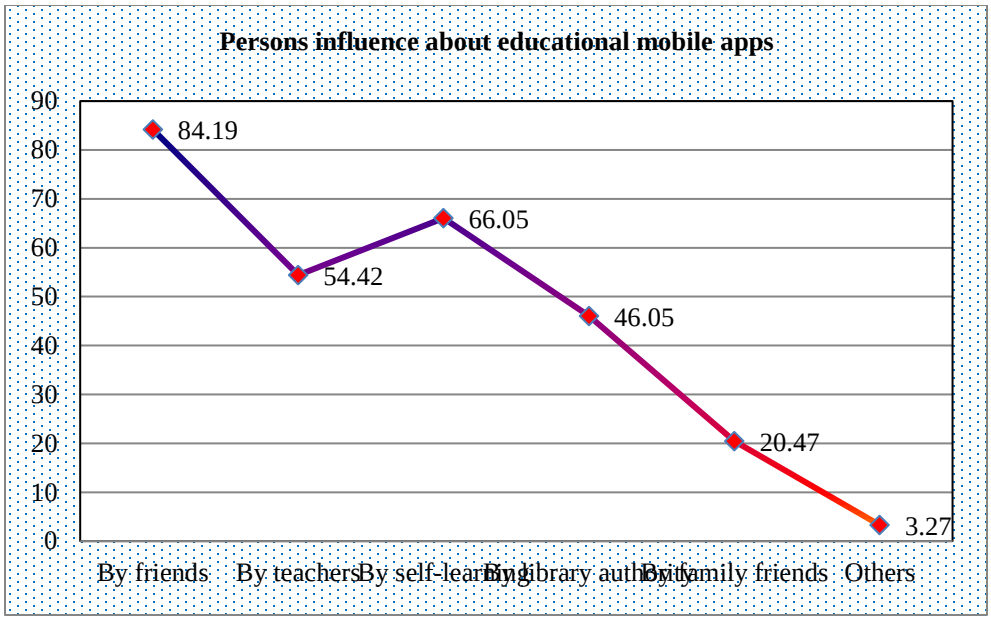

Figure 4 Persons influence to know about educational mobile apps

The above table 7 and fig 4 depicts persons influenced to know educational mobile apps. It is observed that majority 181 (84.19%) of respondents' award educational apps by friends followed by 142 (66.05%) by self-learning, 117 (54.42%) by teachers, 99 (46.05%) by Library authority, 44 (20.47%) by family friends and few of respondents came to know by other factors.

5.8 Use pattern of educational apps for academic activities by the students

Table 8: Use pattern of smartphone for academic activities

Sl. No.	Academic Activities	Strongly Disagree (%)	Disagree (%)	Undecided (%)	Agree (%)	Strongly Agree (%)	Total (%)
1	It helps me in quick access to information anywhere and anytime.	15 (6.98)	25 (11.63)	40 (18.60)	60 (27.91)	75 (34.88)	215 (100)
2	With the help of the smartphone, they gained additional skills and experience for learning outside the classroom.	20 (9.30)	15 (6.98)	45 (20.93)	65 (30.23)	70 (32.56)	215 (100)
3	This allows us to make portrait illustrations that are impossible to remember, such as for later dates.	10 (4.65)	27 (12.56)	30 (13.95)	78 (36.28)	70 (32.56)	215 (100)
4	The smartphone allows me to receive notifications/alerts on various topics quickly.	10 (4.65)	15 (6.98)	25 (11.63)	80 (37.21)	85 (39.53)	215 (100)

5	It enables me to stay updated on upcoming examinations effectively.	12 (5.58)	26 (12.09)	37 (17.21)	60 (27.91)	80 (37.21)	215 (100)
6	It enables the student to record lectures delivered by their Professors during classes.	15 (6.98)	15 (6.98)	50 (23.26)	65 (30.23)	70 (32.56)	215 (100)
7	It enables the students to get reminders about their classes in their Department.	18 (8.37)	25 (11.63)	40 (18.60)	55 (25.58)	77 (35.81)	215 (100)
8	Through my smartphone, I can quickly check all my emails.	5 (2.33)	15 (6.98)	25 (11.63)	80 (37.21)	90 (41.86)	215 (100)
9	It helps me to store all my course materials for easy access.	8 (3.72)	14 (6.51)	40 (18.60)	63 (29.30)	90 (41.86)	215 (100)
10	It helps me in sharing course materials with classmates very quickly.	10 (4.65)	20 (9.30)	35 (16.28)	70 (32.56)	80 (37.21)	215 (100)
11	It helps us to conduct online conferencing as and when we want to make group discussions.	15 (6.98)	10 (4.65)	20 (9.30)	85 (39.53)	85 (39.53)	215 (100)
12	It enables me to use social media to listen to recorded lectures.	10 (4.65)	15 (6.98)	35 (16.28)	75 (34.88)	80 (37.21)	215 (100)
13	It enables me to participate in an online quiz and Internal Assessment remotely anywhere and anytime	6 (2.79)	20 (9.30)	39 (18.14)	65 (30.23)	85 (39.53)	215 (100)

Several purposes influence students to make use of mobile applications. A list of options was given to the respondent to indicate the helpfulness of smartphones for academic activities. The consolidated opinion of 215 respondents was shown in the table 8 majority 90 (41.86%) of respondents opined "strongly agree" that smartphone helps them store course materials for easy access, and to check emails frequently. Whereas, 85 (39.33%) of them indicated smartphone allows to receive notifications alert on various topics and to conduct online conferencing as and when they want to make group discussion. Furthermore, 80 (37.21%) of respondents opined "strongly agree" and "agree" that smartphones help to stay updated about their examinations, to share course materials among classmates, and use social media, and to listen to Audio/video lectures, respectively. Whereas an average i.e., 50 (23.26%) of respondents opined that their smartphone helps record lectures delivered by their professors during class. It can conclude that the majority of the respondents indicated that a smartphone is handy in almost all the ways and means of academic pursuit. In contrast, few numbers of respondents indicated "strongly disagree," "disagree," and "undecided" for the usefulness smartphone.

7. MAJOR FINDINGS

The findings concerning the objectivity of present investigation are summarized here under.

- Based on this survey results, all respondents have a smartphone, and almost 50% of respondents spend 3-4 hours a day on a smartphone.
- Regarding the purposes of using smartphones, 88.84% of respondents appear to make phone calls, and 80.84% emailing while the less i.e.12.56% using draw apps on smartphones.
- It is evident from the study maximum of 75.81% of respondents use News apps, 60% utility apps while, least i.e. 30.23% use travel apps.
- The study found that 84% of respondents were cognizant of educational apps by friends and self.
- The study revealed that 90% of the respondents strongly agree with the statement that smartphones help store course materials for easy access and to check email inbox frequently, and 35% indicated it is helpful to receive notifications alert during group discussion whereas a few of respondents indicated negatively.

7. RECOMMENDATIONS

Based on the results of the study, the following recommendations were made:

- The university must commit itself to promote the use of smartphones in teaching and learning at different levels.
- To make proper use of smartphones for learning purposes, a standardized training program must be implemented; it must also be updated annually to meet all new technological developments and innovations in mobile use for academic purposes.
- The Swayam, NSDL, and e-PG pathshala are the best academic content-oriented apps, and hence it is recommended that all the students make use of these apps for higher learning or up-gradation of knowledge.
- Smartphone services must be included in library operations and services.

- ❖ The authority must maintain the timeliness and effective implementation of the above recommendations.

8. CONCLUSION

The results showed a significant increase in telephone use among students of higher education. The study concludes that the use of high-speed cellular internet services such as Wi-Fi and 3G/4G facilities in different places. This surprising increase can be recognized as the availability of cheap smartphones with very cheap high-speed Internet applications and services. For all the above factors, students are rapidly increasing the use of this mobile technology. Finally, based on our data analysis, it can also be concluded that the use of smartphones among students is expected shortly.

REFERENCES

Elkington, S., & Bligh, B. (n.d.). *Advance HE: Future Learning Studies*. Retrieved April 4, 2020, from https://www.heacademy.ac.uk: https://www.heacademy.ac.uk/system/files/downloads/Future%20Learning%20Spaces_0.pdf

Macwan, U. (2017, Grn 7). *Mobile Technology, Its Importance, Present And Future Trends*. Retrieved Aug 5, 2020, from https://www.finextra.com/blogposting/14000/mobile-technology-its-importance-present-and-future-trends: https://www.finextra.com

Caballe, S., Barolli, L., & Xhafa, F. (2014, May 20). *Using Mobile Phone Devices to Support Online Collaborative Learning*. Retrieved 7 8, 2020, from https://www.researchgate.net: https://www.researchgate.net/publication/220056796_Using_Mobile_Devices_to_Support_Online_Collaborative_Learning.

Baert, S., Vujić, S., Amez, S., Claeskens, M., Daman, T., Maeckelberghe, A., Omey, E., & De Marez, L. (2020). Smartphone use and academic performance: correlation or causal relationship?. *Kyklos, 73*(1), 22-46.

Amez, S., & Baert, S. (2020). Smartphone use and academic performance: A literature review. *International Journal of Educational Research, 103*, 101618.

Ahmed, R.R., Salman, F., Malik, S.A., Streimikiene, D., Soomro, R.H., & Pahi, M.H. Smartphone Use and Academic Performance of University Students: A Mediation and Moderation Analysis. Sustainability 2020, 12, 439.

Han, S., & Yi, Y. J. (2019). How does the smartphone usage of college students affect academic performance? *Journal of Computer Assisted Learning*, *35*(1), 13-22.

Zhao, J., Yuping, W., Maideen, I., Moe, Z. K., & Nasirudeen, A. M. A. (2018). The Relationship between Smartphone Use and Academic Performance in a Sample of Tertiary Students in Singapore: A Cross-Sectional Study. *Journal of Educational Technology*, *14*(4), 28-35.

Ng, S. F., Hassan, N. S. I. C., Nor, N. H. M., & Malek, N. A. A. (2017). The Relationship between Smartphone Use and Academic Performance: A Case of Students in A Malaysian Tertiary Institution. *Malaysian Online Journal of Educational Technology*, *5*(4), 58-70.

Yi, Y.J., You, S. & Bae, B. J. (2016). The influence of smartphones on academic performance: The development of the technology-to-performance chain model, *Library Hi Tech*, *34*(3), 480-499.

Kuri, R., Maranna, O., & Basavaraj, J. (2017). Use of Smart Phone For E-Learning By The P.G. Students Of Rani Channamma University BelagavI. *KIIT Journal of Library and Information Management, 4*(1), 1-11.

Singh, K. & Parameswaran, R. (2017). Academic Use of Smartphones by the Students of Faculty of Social Science, Banaras Hindu University, Varanasi: A Case Study. *Journal of Advances in Library and Information Science, 6*(4), 394-399.

Iqbal, S., Naeem Khan, M., & Riaz Malik, I. (2017). Mobile Phone Usage and Students' Perception towards M-Learning:A Case of Undergraduate Students in Pakistan. *International Journal of E-learning & Distance Education, 32*(1), 1-16.

Lusekelo, K., & Mgaya, G. (2015). Smartphones' Effects on Academic Performance of Higher Learning Students.A Case of Ruaha Catholic University – Iringa, Tanzania. *Journal of Multidisciplinary Engineering Science and Technology (JMEST), 2*(4), 777-784.

Noah Darko, A. (2019). The use and effect of smartphones in students learning activities: Evidence from the University of Ghana, Legon. *Library Philosophy and Practice (e-Journal), 2851*, 1-37.

Sumathi, K., Lakshmi, S., & Kundhavai, S. (2018). Reviewing the Impact of Smartphone Usage on Academic Performance Among Students of Higher Learning. *International Journal of Pure and Applied Mathematics, 118*(8), 1-7

*****