A Comparative Analysis of Telecom Service Providers Among Graduate, Postgraduate, and Fresh Working Students

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Abstract

The purpose of this study paper is to compare telecom service providers for graduate, postgraduate, and first-time working students. Understanding customer preferences and behaviors across various demographic groups is essential for telecommunication service providers given the expansion of communications services. This study aims to determine the differences in preferences and satisfaction levels between these three categories by looking at things like pricing, network coverage, service quality, brand reputation, and customer support. The study intends to provide insights into the specific demands and preferences of graduate, postgraduate and first-year working students in selecting telecom service providers through surveys and data analysis. Students were asked to complete a standardized questionnaire in order to obtain the primary data. Three distinct groups' worth of questionnaires were thoroughly examined in total. According to the survey, students' choices vary as their qualifications develop while they are seeking their degrees, after they graduate, and once they begin working. It has been discovered that their selection criteria for telecom operators are entirely different. The study's conclusions can guide the development of marketing plans and product offerings aimed at these particular demographic groups.

Keywords: Graduate and Post Graduates Students, Preferences, Service Selection Criteria, Telecom Service Providers

I. INTRODUCTION

1.1 Background- Due to its ability to provide people with connectivity, communication, and information access, telecommunication services are essential to their daily life. Graduate, postgraduate and fresh working students make up a sizable portion of the population, with unique demands and preferences when it comes to telecom services. Telecom service providers can better serve these segments by customizing their offers by understanding the elements that influence their decisions.

1.2 Research Objectives

1. To study the pattern of student with advancement of Qualification and employment
2. To understand the factors determining choice of telecom operators
3. To investigate problems faced by service users
4. To Suggest measures to the problems

2. Introduction to telecom industry of India

In August 2023, there were 1,179.21 million phone subscribers in India. In August 2023, the tele-density of rural users was 57.97%. Between Q1, FY18 and Q1, FY24, the total amount of wireless data used increased by more than seven times, from 4,206 petabytes to 44,967 petabytes. India is among the world's top consumers of data as well. According to TRAI, in December 2022, the average monthly cellular data consumption per subscriber increased from 61.66 MB in March 2014 to 17.11 GB.

Attractive Opportunities

• 350 million 5G subscribers in India are expected by 2026, making about 27% of all mobile subscriptions.
• The value of mobile phone exports was US$ 10.84 billion (about ₹90,000 crore) in FY23. Furthermore, electronic goods exports were projected to reach US$ 6.89 billion in April–June 2023.
• India would require over 22 million qualified professionals by 2025 to work in 5G-centric fields including robotics, cloud computing, artificial intelligence (AI), and the Internet of Things (IoT).
•In terms of "international Internet bandwidth" and "international mobile broadband internet traffic," India comes in second.

Policy Support

The Department of Telecom's production-linked incentive (PLI) programme for telecom and networking goods was approved by the Union Cabinet for a total of ₹12,195 crores (US$ 1.65 billion). As of December 2022, 42 companies—28 MSMEs and 14 Non-MSMEs (seven domestic and seven international)—had pledged an investment of US$ 502.95 million (₹4,115 crore) through the PLI Scheme. The Department of Telecommunications (DoT) has created a sixth-generation (6G) innovation group to spearhead the development of 6G technologies.

Increasing Investments

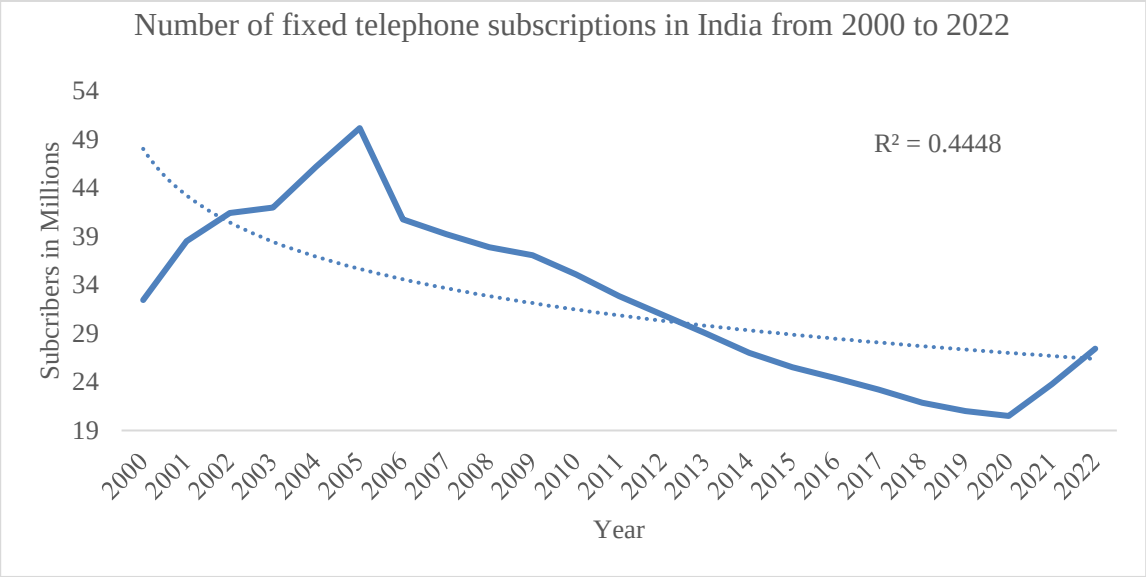
- The Department of Telecommunications received ₹97,579.05 crores (US$ 11.92 billion) in the Union Budget 2023–24. Of this, US$ 611.1 million (₹5,000 crore) is for Bharatnet, while US$ 48.88 million (₹400 crore) is for research and development.
- From April 2000 to September 2023, foreign direct investment (FDI) inflows into the telecom sector totalled US$ 39.31 billion.
- As of September 2022, the PLI plan for Large Scale Electronics Manufacturing had garnered approximately US$ 569.49 million (about ₹4,700 crore) in investment.

(Source- https://www.ibef.org/industry/telecommunications)

Table-1- Fixed landline subscription in India

Year	Subscribers in Millions
2000	32.44
2001	38.54
2002	41.42
2003	42
2004	46.2
2005	50.18
2006	40.77
2007	39.25
2008	37.9
2009	37.06
2010	35.09
2011	32.84
2012	30.94
2013	29.03
2014	27
2015	25.52
2016	24.4
2017	23.23
2018	21.87
2019	21
2020	20.5
2021	23.79
2022	27.45

Source- Statista@2024



The data shows that fixed landline subscribers peaked in 2005 at 50.18 million. After 2005, there was a steady decline in landline subscribers all the way through 2020. Some potential reasons for this decline include:

The rise in mobile/cellular phone adoption and subscribers. Many people discontinued their landlines and switched exclusively to mobile.

Voice over IP (VoIP) and internet phone services became more popular as high speed internet became more widely available. Services like Skype allowed people to make calls over the internet without needing a landline.

The younger generation of millennials and Gen Z grew up with mobile phones as their primary phone service. They are less likely to ever have or need a landline.

Despite over 15 years of decline, the most recent 2021 and 2022 data shows a slight rebound in landline subscribers, increasing from 20.5 million in 2020 to 27.45 million in 2022. Some possibilities for this recent increase:

COVID-19 lockdowns may have led more people to add home phone services in case of emergency.

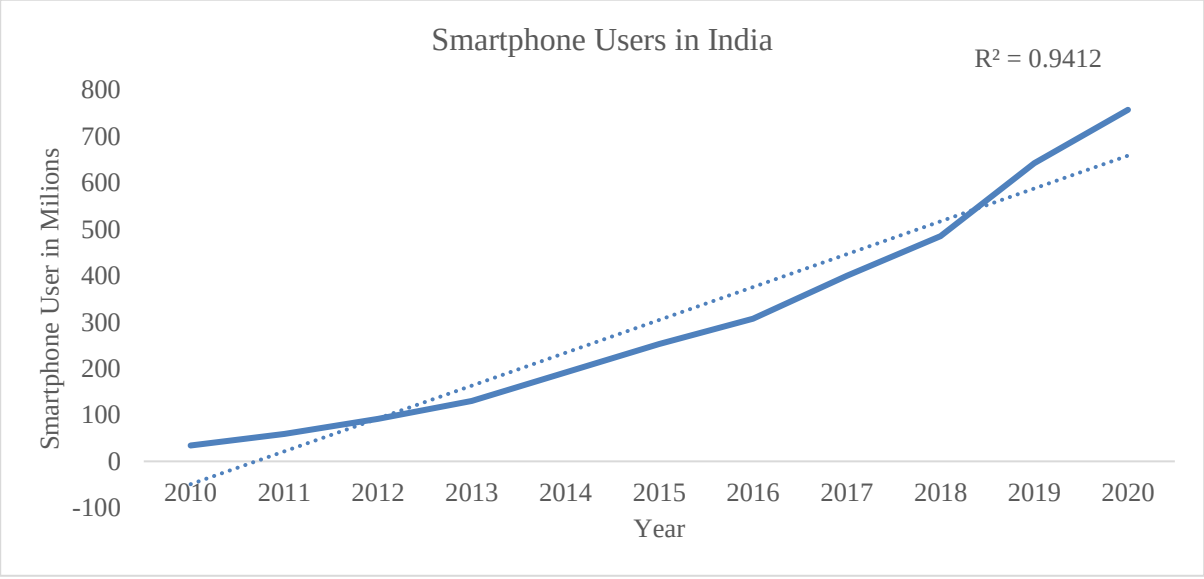
Landlines may be retro increasing in popularity as people tire of mobile phone use. Some view landlines as more focused communication without distraction.

In summary, landlines have declined substantially since their peak in 2005 but may be stabilizing or even slightly increasing again in the most recent few years. Mobile and internet-powered phone services are still vastly more popular overall.

Table-2 Smartphone Users in India

Year	Smartphone User in Millions
2010	34.18
2011	59.08
2012	91.26
2013	130.11
2014	191.67
2015	253.09
2016	307.57
2017	399.4
2018	485.14
2019	642.34
2020	757.2
2021	853.42
2022	938.27
2023	1013.57

Source- Statista@2024



R^2=0.9412

Interpretation: - The data shows the number of smartphone users in India in millions from 2010 to 2023. There has been rapid growth in smartphone adoption over this time period. In 2010, there were 34.18 million smartphone users, and this number has grown nearly 30 times to over 1 billion smartphone users projected in 2023.

The data fits an exponential growth curve extremely well, with an R^2 value of 0.9412 indicating over 94% of the variance in smartphone users can be explained by the exponential trend. This highlights the accelerating pace of adoption. From 2010 to 2014, the number of users less than 6xed from 34 million to 192 million (4.6 times growth). However, from 2014 to 2023 the number of users grew over 5 fold from 192 million to 1,013 million.

The exponential growth is evident, even on a logarithmic vertical axis scale. If these trends continue, India will soon have more smartphone users than any country in the world. Driving factors likely include expanding middle class, younger demographics, declining device prices, and improving network infrastructure.

Table-3 Gross Enrolment Ratio at Higher Education level (18 to 23 years) 2016-17 to 2020-21

Year	Male	Female	Both
2016-17	24.3	23.8	24.1
2017-18	24.5	24.6	24.6
2018-19	24.4	25.5	24.9
2019-20	24.8	26.4	25.6
2020-21	26.7	27.9	27.3

Source: AIHES, Ministry of Education (different years).

- The gross enrolment ratio measures the number of students enrolled in higher education, regardless of age, as a percentage of the population in the typical age group for higher education (18 to 23 years old).
- The data shows that gross enrolment ratio has been increasing steadily for both males and females over the 5-year period.
- In 2016-17, the GER for males was 24.3% while for females it was slightly lower at 23.8%. By 2020-21, it has increased to 26.7% for males and 27.9% for females.
- The gender gap has narrowed over this period with the GER for females catching up and exceeding that of males. In 2020-21, the GER for females is 1.2 percentage points higher than for males.
- Overall, the combined GER for both males and females has increased from 24.1% in 2016-17 to 27.3% in 2020-21, representing a growth of 3.2 percentage points or 13.3% over the 5-year period.
- This indicates increased participation in higher education in the country across both genders. However, the GER is still relatively low with less than 30% of the eligible population enrolled. There is scope to further improve access to higher education.

In summary, there has been steady improvement in gross enrolment ratio at higher education level over 2016-17 to 2020-21, driven by strong growth in participation of both males and females. However, overall enrolment levels remain low.

II. LITERATURE REVIEW

Naidu, Y. K. M., & Ponduri, S. B. (2015) emphasized that. Indian telecom providers must create strategies for special benefits in order to satisfy their customers. Additionally, they want to confirm and assess whether their benefit plans are genuinely intended to increase client loyalty. In order to adopt CRM, telecom companies need to change their perspective from one that is product-oriented to one that is customer-oriented. This requires architecture, which can alter organizational culture and operations and foster greater collaboration between CRM and various stakeholders. As a result, the service provider can enhance client happiness and grow their base of devoted clients. As a result, telecom businesses must now not only implement CRM strategies but also modify their CRM procedures to better meet the needs of their clients.

Tiwari, H. N., & Mishra, A. K. (2021) stated that their study was to investigate the underlying variables that influence university students' selection of mobile service provider. All demographic groups of Delhi University students are unwilling to switch service providers, and they believe that local calling, SMS, and data pack prices are reasonable but that STD and roaming fees are somewhat exorbitant. For female students, inter-circle connectivity—or connectivity when roaming—has the potential to raise satisfaction levels. Overall, customers are satisfied with the calibre of services offered by customer service centers; nevertheless, students have negative perceptions about their ability to communicate with executives. Students, who are generally older, place higher value on the availability of customer service centers, recharge vouchers, etc.

Thokoa, K. E., & Kalebe, K. M. (2015). Examined that network accessibility, customer support offerings, call costs, and student happiness are all positively correlated. The results also show that, after customer service and call costs, network availability is the most crucial factor in determining students' satisfaction. Furthermore, it was discovered that, on average, 50% of students are happy with their mobile phone service providers, regardless of the supplier. However, it was discovered that students who subscribe to ETL are happier than those who subscribe to VCL when it comes to service provider. Finally, the study's results indicate that there is no statistically significant difference between the overall satisfaction levels of male and female respondents.

Kukreja, M. N., & Ajagaonkar, P. (2021) showed that in order to appeal to the younger generation, more positioning and advertising tactics should be used since they place greater value on elements like brand image.
Furthermore, with Reliance Jio's entry into the telecom industry, which is going through a very competitive period, the other service providers must ensure that their network and service aspects are not only very important but also that their customers gain value. Value is the advantage that customers receive in exchange for the cost of the service.

Sulaiman, A., & Dashti, A. (2018). revealed that students at both public and private universities expressed satisfaction with their use of SPs in the classroom. The findings showed that compared to male students, female students had higher levels of satisfaction with ML. Also, compared to non-Kuwaitis, Kuwaiti students expressed greater satisfaction. Furthermore, compared to students with lower GPAs, those with higher GPAs expressed greater satisfaction with ML. Furthermore, compared to students from all other institutions, students from the colleges of Education and Life Science expressed greater satisfaction with ML, while students from the colleges of Pharmacy and ReliJIOus Studies expressed the lowest level of satisfaction. Students who used their SPs for more than four hours a day reported higher levels of satisfaction with machine learning (ML) compared to those who used them for shorter periods of time.

Uppal, M. A., Zahid, Z., & Ali, S. (2019) found that The proliferation of mobile technology and its subsequent evolution have spurred educators to investigate the pedagogical applications of mobile phones. Students of all ages use mobile phones for information access, entertainment, and data storage in addition to communication. Mobile devices are now used for many activities, such as photography, data storage, TV and movie watching, and internet access in general. Nonetheless, it appears that few people use their phones for educational purposes. In this study, we examine the variables that influence students' perceptions of using mobile devices for learning. These variables include "readiness for mobile learning," "device issues," "learning method issues," "financial issues," and "knowledge on mobile learning."

Wong, K., Wang, F. L., Ng, K. K., & Kwan, R. (2015) showed that students' academic progress, particularly in the area of mathematics, is positively impacted by the use of mobile learning activities. The results show that mobile learning can improve student engagement because of the high levels of collaboration and participation that students exhibited. Teachers often see mobile learning favourably because of its ability to encourage students' self-directed learning. Variability in the outcomes and attitudes toward mobile learning across educational levels highlights the need for customized approaches.

III. RESEARCH METHODOLOGY

3.1 Sampling Strategy -The goal of this research is to achieve the intended goals. In order to achieve this, we created a self-administered questionnaire on a 5-point Likert scale with multiple variables addressing various aspects of satisfaction and provider choice related to telecommunication services. We then used basic random sampling to distribute the questionnaire to SPPU University students. Each agreement or disagreement response was assigned a numerical code. It was powered by Google Forms and coded as "1 for strongly disagree, 2 for disagree, 3 for neither agree nor disagree, 4 for agree, and 5 for strongly agree." We selected SPPU University since a significant proportion of students admitted to various programs and colleges originate from various regions of the nation, enabling us to obtain a representative sample.

3.2 Data Collection Methods

The Data of three various groups was collection by simple random sampling. First group- Undergraduates, second group – Pursuing Post graduation and last group –who started working in their final semesters.

A. Survey Design

Research design is exploratory and descriptive in nature. By Triangulation method researcher has used both qualitative and quantitative data to develop a comprehensive understanding of phenomena. This research is inductive and uses cross sectional research design.

B. Data Analysis Techniques

The data was analyzed by ANOVA and Z test methods. On Jamovi 2.3.28 version

C. Sample Size

- Graduates - 193
- Postgraduates - 127
- Working Students - 56

IV. COMPARATIVE ANALYSIS OF TELECOM SERVICE PROVIDERS

Table 4.- Current Telecom Operators in India

S.N	Operator	Started operations
1	Airtel India	1995
2	BSNL	2000
3	MTNL	1986
4	Jio	2016
5	Vodafone Idea Limited	2018

Table 5. -India's telecom despair

S.N	Operator	Started operations	Ceased operations	Fate
1	Telenor India	2006	2018	Acquired by Bharti Airtel
2	Tata Docomo	2009	2019	Acquired by Bharti Airtel
3	Hutch Essar	1999		Acquired by Vodafone to form Vodafone India
4	MTS India	2009	2017	Acquired by Reliance Communications
5	Idea Cellular	2002	2018	Merged with Vodafone India to form Vi
6	Vodafone India	2011	2018	Merged with Idea Cellular to form Vi
7	Virgin Mobile India / T24 Mobile	2009	2015	Merged into Tata Docomo
8	Axiata Spice Communications	1992		Merged into Idea Cellular
9	Escotel	1996		Merged into Idea Cellular
10	Modi-Telstra	1990		Merged into Axiata Spice Communications
11	S Tel	2012		Licence cancelled by the Supreme Court of India
12	Etisalat	2010	2012	Licence cancelled by the Supreme Court of India

13	BPL Mobile (Loop Mobile)	1995		Ceased operations after expiration of licence
14	Videocon Telecom	2010	2016	Shut down following sale of spectrum to Bharti Airtel
15	Reliance Communications	2004	2019	Bankrupt
16	Aircel	1999	2018	Bankrupt

Source- TRAI

India is the only nation in the world that is known to have experienced such a chaotic state with its crucial telecom sector. Sixteen telecom operators the majority having international connections were forced to discontinue business in India within the past ten years. Eleven of them have occurred since the NDA administration took office in 2014. There are now five primary operators in the nation. And only one of them the recent entrant Reliance Jio is turning a profit. Jio does not function as a separate business entity. It is a component of Reliance Industries, the massive national corporation (RIL). Instead, the government has benefited exclusively from its ad hoc telecom policy, receiving billions of dollars in revenue share, foreign direct investments, license fees, and revenue sharing.

Table 6. Airtel 365-day validity recharge plans

Plan	Benefits
₹1,799	Unlimited calling, 24GB data, 3600 SMS, Additional benefits – Apollo 24×7 Circle, Wynk Music, free Hellotunes, and ₹100 FASTag cashback
₹2,999	Unlimited calling, 2GB data/day, 100 SMS/day, Additional benefits – Apollo 24×7 Circle, Wynk Music, free Hellotunes, and ₹100 FASTag cashback
₹3359	Unlimited calling, 2.5GB data/day, 100 SMS/day, Additional benefits – 1 year Disney+ Hotstar Mobile, 1 year Amazon Prime Mobile Edition, Apollo 24×7 Circle, Wynk Music, free Hellotunes, and ₹100 FASTag cashback

Table 7. Jio 365-day validity recharge plans

Plan	Validity	Benefits
₹2,879	365	Unlimited calling, 2GB data/day, 100 SMSs/day, free access to Jio Suite apps
₹2,999	388	Unlimited calling, 2.5GB data/day, 100 SMSs/day, free access to Jio Suite apps

Table.8 Vi 365-day validity recharge plans

Plan	Benefits
₹1,799	Unlimited calling, 24GB data, 3600 SMS, free access to Vi Movie and TV app
₹2,899	Unlimited calling, 1.5GB data/day, 100SMSs/day, Binge all night, weekend data rollover, and up to 2GB of backup data every month, free access to Vi Movie and TV app
₹2,999	Unlimited calling, 850GB data, 100SMSs/day, Binge all night and free access to Vi movies and TV
₹3,099	Unlimited calling, 2GB data/day, 100SMSs/day, Binge all night, weekend data rollover, and up to 2GB of backup data every month, Disney+ Hotstar Mobile subscription, free access to Vi Movie and TV app

Table.9 BSNL 365-day validity recharge plans

Plan	Benefits
₹1,198	300 Min of calling, 3GB data/month, 30 SMS/month
₹1,999	Unlimited calling, 100 SMSs/day, 600 GB of data, free access to BSNL Tunes with an unlimited song change option, an EROS Now subscription, and Lokdhun content for 30 days
₹2,399	Unlimited calling, extra 30 days of validity, 2GB data/day, 100 SMSs/day, free BSNL Tunes and EROS Now Entertainment subscription for 30 days
₹2,999	Unlimited calling, 3GB data/day, 100SMSs/day,

V. RESULTS AND DISCUSSION

Table 10 Descriptive Statistics (Demographics factors)

Frequencies of Gender							
Gender		**Counts**		**% of Total**		**Cumulative %**	
Male		197		61.6 %		61.6 %	
Female		123		38.4 %		100.0 %	
Frequencies of Connection							
Connection		**Counts**		**% of Total**		**Cumulative %**	
Prepaid		267		83.4 %		83.4 %	
Post-paid		53		16.6 %		100.0 %	
Frequencies of Age							
Age		**Counts**		**% of Total**		**Cumulative %**	
Below21		126		39.4 %		39.4 %	
22-25		158		49.4 %		88.8 %	
26-28		36		11.3 %		100.0 %	

Table-11Time Spent for uses of Smart Phone

Age		**Time Spent**		**Counts**		**% of Total**		**Cumulative %**	
Below21		Social Media		81		25.3 %		25.3 %	
		Entertainment		45		14.1 %		39.4 %	
		Educational Apps		0		0.0 %		39.4 %	
		Information		0		0.0 %		39.4 %	
22-25		Social Media		38		11.9 %		51.2 %	
		Entertainment		13		4.1 %		55.3 %	
		Educational Apps		101		31.6 %		86.9 %	
		Information		6		1.9 %		88.8 %	
26-28		Social Media		2		0.6 %		89.4 %	
		Entertainment		2		0.6 %		90.0 %	
		Educational Apps		8		2.5 %		92.5 %	
		Information		24		7.5 %		100.0 %	

The given data presents information about the time spent by different age groups on various uses of smartphones. Here's an analysis and interpretation of the results:

1. **Age Group "Below 21"**

- This age group primarily uses smartphones for social media (25.3% of total usage) and entertainment (14.1% of total usage).
- There is no recorded usage for educational apps or information-related activities.
- The cumulative percentage for this age group is 39.4%, indicating that nearly 60% of their smartphone usage is dedicated to other purposes not mentioned in the data.

2. **Age Group "22-25":**

- The majority of smartphone usage in this age group is for educational apps (31.6% of total usage).
- Social media (11.9%) and entertainment (4.1%) still have significant usage, but less than the younger age group.
- Information-related activities account for a small portion (1.9%) of their smartphone usage.
- The cumulative percentage for this age group is 88.8%, suggesting that a notable part (around 11%) of their smartphone usage is not covered by the listed categories.

3. **Age Group "26-28":**

- This age group exhibits a more balanced usage across different categories.
- Information-related activities (7.5%) have the highest usage, followed by educational apps (2.5%), and social media and entertainment (0.6% each).
- The cumulative percentage for this age group is 100%, indicating that the listed categories cover their entire smartphone usage.

Overall Observations:

- The younger age group ("Below 21") primarily uses smartphones for social media and entertainment purposes, with no recorded usage for educational apps or information-related activities.
- The middle age group ("22-25") shows a shift towards using smartphones for educational purposes, while still maintaining a significant usage for social media and entertainment.
- The older age group ("26-28") has a more diverse and balanced usage, with a higher emphasis on information-related activities and educational apps compared to the other age groups.
- It is important to note that the data may not cover all possible smartphone usage categories, as indicated by the cumulative percentages not adding up to 100% for the younger and middle age groups.

These insights can be valuable for understanding the varying smartphone usage patterns and preferences among different age groups, which can inform product development, marketing strategies, or educational initiatives tailored to specific age demographics.

Table -12 Frequencies of Service Provider

Frequencies of Service Provider							
Service Provider		**Counts**		**% of Total**		**Cumulative %**	
BSNL		18		5.6 %		5.6 %	
Airtel		97		30.3 %		35.9 %	
JIO		108		33.8 %		69.7 %	
Vodaphone India		97		30.3 %		100.0 %	

The table shows the frequencies and percentages of different service providers in a given dataset. Here's an interpretation of the results:

- There are four service providers represented in the data: BSNL, Airtel, JIO, and Vodaphone India.
- JIO has the highest frequency with 108 counts, accounting for 33.8% of the total.
- Airtel and Vodaphone India have the same frequency of 97 counts, each contributing 30.3% of the total.
- BSNL has the lowest frequency with 18 counts, representing 5.6% of the total.
- The cumulative percentages show that BSNL accounts for the first 5.6%, Airtel accounts for the next 30.3% (up to 35.9%), JIO accounts for the next 33.8% (up to 69.7%), and Vodaphone India accounts for the remaining 30.3% (up to 100%).

Interpretation of the results:

- JIO is the most prevalent service provider in the dataset, followed by Airtel and Vodaphone India, which have an equal representation.
- BSNL has a relatively small presence compared to the other service providers.
- The market seems to be dominated by three major players: JIO, Airtel, and Vodaphone India, with JIO having a slight edge over the other two.
- The results may reflect the market share or customer preference for these service providers in the region or context where the data was collected.

It's important to note that these interpretations are based solely on the frequency data provided in the table, and additional information about the data collection process, target population, and other factors would be needed to draw more comprehensive conclusions.

VI. CONCLUSION

1) There is a decrease in the number of call drops.
2) The cost of smartphones is reasonable.
3) Students prefer smartphones with dual SIM cards.
4) There is a pattern in the behavior of the students. that students use better phone connectivity from one provider and more cheap data from another.
5) High mega pixel cell phones are preferred by students.
6) Students' monthly expenses ranged from ₹200 to ₹500.
7) Prepaid connections are preferred by most students over post-paid ones.
8) Undergraduate students utilize their phones for music, entertainment, and social networking. Working students for information and employment objectives; postgraduates for certification and educational apps.
9) Of the pupils, about half have used port service.
10) It's highly unlikely that pupils go back to their original service provider.
11) According to the students, they expect: i) Speed; ii) Services; iii) Compatibility with future technologies; and iv) Reasonable prices.
12) The following are the main causes of service provider changes: i) Network coverage; ii) Poor service from the previous provider; iii) Alluring schemes from third parties; and iv) Exorbitant cost

VII. RECOMMENDATIONS FOR TELECOM SERVICE PROVIDERS

1) The rivalry among telecom service providers ought to intensify.
2) If value-added services are offered, students are prepared to pay.
3) Artificial Intelligence and Machine Learning should be included as value added service

VIII. LIMITATIONS OF THE STUDY

The study was limited to the southern region of Pune, where a variety of graduate and undergraduate students are pursuing their education. The majority of the data was pertaining to postgraduate MBA management students and undergraduate students studying commerce. There are just four companies offering telecom services. As a result, there is limited option for students to choose from among different service providers. It is therefore far too difficult to generalize.

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