Enhancing Digital Literacy And Technological Skills In Youth Communities In Karnataka

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Abstract

Technological literacy has now become a necessitate to education and employment in the fast-paced digital era and social life. This research will evaluate the current level of digital literacy and technological proficiency of Karnataka youth populations, identify the barriers that make them physically inaccessible to digital inclusion and offer viable solutions to enhance their digital literacy and proficiency. Structured questionnaires and descriptive study design were used in the collection of 100 respondents in various districts. The study found out that even though a large percentage of the young generation has basic computer and smartphone knowledge, the advanced digital literacy level including data management, digital collaboration, cybersecurity awareness, and the adoption of new technologies is still considerable. The paper will conclude by stating that special training initiatives, government-business partnership, and integration of digital skills training modules into the official curriculum can make the Karnataka youth workforce and enhance inclusive digital development significantly. The research concludes that inclusive digital education, the improvement of internet access in rural communities, and the incorporation of ICT- based training into the educational programs are the key measures that may be implemented to empower digital skills. Such programs can overcome the digital divide and make the youth in Karnataka be able to be active members of a technology driven world.

Keywords: Digital literacy, Technological skills, Youth empowerment, Karnataka, Digital divide, ICT education.

Introduction

Digital literacy does not only entail the capacity to utilize technology but it involves the knowledge, skills and attitude needed to access, analyze, judge, create, and communicate information in digital settings effectively. Digital competence is now an important factor in determining employability and innovation in a knowledge-based economy (Gilster 1997) . The state of Karnataka has one of the highest technological and innovative settings in India and hence, gives a special setting to the study of youth digital literacy. Although Bengaluru, the Silicon Valley of India, is home to the youth, there is still a digital skills gap between the urban and rural youth, as well as the various socio-economic groups. The growing adoption of digital tools in education, governance and business requires a digitally empowered and not just digitally

conscious population of the youth. Thus, the paper will examine the degree of digital literacy among young individuals in Karnataka and how it can be harnessed to improve the technological capacity of young people in order to achieve sustainable social and economic development. Digital literacy as a skill of using digital tools and accessing information as well as communicating online has become a crucial life skill in the rapidly evolving environment (Bawden 2008) . To the youth, digital literacy is a pathway to education and jobs, as well as a platform on which they can be socially integrated and participate in civic activities.

Karnataka the so called technology capital of India is one of the leading states in the digital revolution in the country, with giant IT centers like Bengaluru. The state has recorded remarkable advancement in facilitating technological-based invention and entrepreneurship. There is however, a rising digital divide in the youth population, between urban and rural areas, under the same technological advancement. Although young people in urban areas tend to have access to quality digital infrastructure, training facilities, and job opportunities, there are still disadvantaged youth in the rural areas that continue to face a lack of internet connectivity, the lack of digital education, and the lack of exposure to new technologies (Reddy Sharma 2020). The given disparity presents a serious problem to the objective of inclusive development adopted by the state. Digital skills can be used to determine access to online education, e-governance services, job portals, and entrepreneurship resources. Digital illiteracy among the young population can therefore have a negative impact on the youth engagement in the knowledge economy and social mobility, and as such, the Government of Karnataka and other non-governmental organizations have initiated programs like the Karnataka Digital Economy Mission (KDEM) and YuvaNidhi to overcome the digital skills gap (Patter 2013). Nonetheless, evaluating the current level of digital awareness and understanding of the main barriers in developing digital skills and implementing sustainable models to support the growth of digital proficiency among the youth communities in the state are crucial questions that need to be addressed in this article.

Review of literature

UNESCO (2022) has claimed that digital literacy is one of the building blocks of 21st-century education, as it enables an individual to participate successfully in a knowledge-based society. According to a study conducted by the National Digital Literacy Mission (NDLM, 2023), urban youth in India exhibit a high degree of digital engagement, whereas rural populations lag behind in both access and skills. Likewise, the Internet and Mobile Association of India (IAMAI, 2022) has highlighted the inherent urban–rural disparity in the usage of internet and digital literacy levels.

Karnataka Digital Economy Mission (KDEM) and YuvaNidhi aim to bridge this digital divide by providing digital infrastructure, e-learning opportunities, and job-oriented skill development programs. Nevertheless, as the literature suggests, the success of these programs largely depends on continuous capacity building, the development of localized training materials, and the inclusion of marginalized youth. Hence, practical, inclusive, and sustainable approaches are essential to enhance digital literacy among the youth of Karnataka.

Sharadamma, C. A., and Hemavathi, B. N. (2020) evaluated digital literacy skills in the acquisition of electronic information sources among government first grade college librarians in Karnataka. In another study, they have examined that digital literacy abilities of the postgraduate

students at Bangalore North University, Kolar, Karnataka. The empirical study has surveyed 186 postgraduate students. It has revealed that while most of the students (approximately 63%) owned smartphones, their usage was predominantly for the social media rather than any academic purposes. Only one-third has expressed a readiness to transition to the digital learning platforms. and highlighting the major gaps in higher education and the digital readiness within the state of Karnataka.

Shettappanavar, L., and Krishnamurthy, C. (2019) conducted a study on the information literacy among the female postgraduate students of Karnataka University in Dharwad region. The study has significantly highlighted that many female postgraduate students lacked the basic awareness of advanced search strategies, open educational resources, and academic networking platforms. It has been significant that connectivity issues and low proficiency in the critical digital skills serve as major barriers within Karnataka's higher education profile.

Kaakandikar, R., Nikam, R., Vanarse, R. A., and Khedkar, A. M. (2021), in the following article named Digital Literacy an Impact on Rural Business Competencies A Study from India focusing on the rural populations across India using a mixed-methods approach. This study has found that participants who completed digital literacy training have reported an improved confidence and competence in using of digital tools for their business and entrepreneurship. These findings suggests that there is a potential value of similar digital literacy initiatives for rural youth in Karnataka.

Litiņa, S., and Miltuze, A. (2021) study titled Students' Digital Competence A Review on the Measuring Instruments. Their findings have suggested that students often overestimate their digital competence, particularly in the information and data literacy. This aligns with the recent observations in Karnataka, where students' self-assessments of the digital proficiency often do not match with their actual skill levels that is required, highlighting the need for a more broader digital skill assessment tools to evaluate youth readiness accurately.

Kothandapani, H. P.(2024) has evaluated the effects of digital literacy that has an impact on the of the employability of the adult learners. The study has suggested that factors such as age, cost have significantly influenced the adoption and usage of the digital skills that are very much essential and consequently impacts the employability outcomes. These findings suggest that similar structural challenges may affect youth in Karnataka unless such systemic barriers are addressed through targeted interventions.

Research Gap
Although there is a crucial number of governmental and non-governmental programs to increase digital literacy in India, the gap in the research on the effectiveness of the programs in improving

access to technologies and socio-economic opportunities of youth communities in Karnataka is still significant. The current literature concentrates intensively on national-level data or urban young people, thus rural and semi-urban youth are underrepresented. Additionally, the available empirical research on the real effect of digital literacy training on employability, entrepreneurship, and digital inclusion is limited. Currently, the introduction of new technologies into the digital education program in the form of artificial intelligence, data analytics, and cybersecurity is also under- researched. The other weakness is the evaluation of the local governance, community based organization and learning institutions role in maintaining the efforts of digital skill development. Moreover, research seldom considers gender difference, accessibility, or the behavioural change in the long run, which may be due to the digital empowerment programs. It is important to address these gaps to develop inclusive and effective strategies in improving digital literacy and technological competence among the Karnataka youth.

Background of the Study

In the modern digital age, digital literacy and technological proficiency has become a requirement to social standing, economic development and individual empowerment. As the speed of information and communication technologies (ICT) development has increased, the skill of effective utilization of digital tools has become not only an advantage but also a need. Digital India, Skill India Mission, Pradhan Mantri Kaushal Vikas Yojana (PMKVY) and other initiatives have been launched in India to enhance digital capacity among different social groups. Nevertheless, even with such initiatives, there has been a significant digital divide and it is especially available to the youth in rural and semi- urban regions. As one of the leading states in information technology in India, Karnataka has its opportunities and challenges in the field of digital empowerment. Although cities such as Bengaluru have grown and become centers of technology in the world, there are still numerous constraints in the choice of access to digital infrastructure, awareness, and skill development opportunities in many of the Karnataka districts and villages. The young population, which constitutes a high number of people in the population, is at times not able to get the digital skills required to engage successfully in education, work and even in entrepreneurship within the digital economy. Inclusive development can thus only be realized through improvement of digital literacy and technological skills among the youth communities. Making young people be competent in such areas can enhance employability opportunities, promote innovation, and help in engaging in e-governance, as well as enhance social equity. Although there are various government and non-governmental initiatives that are designed to build skills, there is a lack of evaluation of such programs in terms of effectiveness and sustainability in the community. Therefore, the paper aims to investigate the current situation, issues, and opportunities in terms of digital literacy and technological skill development among the youth in Karnataka and attempt to bridge the gap in knowledge and suggest the methods of making the process more effective.

Objectives of the Study

• To assess the current level of digital literacy among youth in Karnataka.
• To examine the role of educational institutions and government initiatives in promoting digital skills.
• To suggest strategies for enhancing digital literacy and employability among youth

communities.

Hypothesis of the Study

Main Hypothesis (H_1):
Enhancing digital literacy programs and technological skill development initiatives has a significant positive impact on the employability, innovation capacity, and socio-economic empowerment of youth communities in Karnataka.

Null Hypothesis (H_0):
There is no significant relationship between digital literacy and technological skill enhancement initiatives and the overall socio-economic development of youth communities in Karnataka.

Scope of the Study
Digital literacy plays a critical role in balancing the information and opportunity gap between the youth. In Karnataka, a big percentage of the young people in the rural areas continue to be deprived of formal training services, good digital networks, and low-cost connections to the internet. This research is necessary due to the increased relevance of digital competencies in education, work, and startup. The area this study is going to cover is the analysis of the ways digital inclusion policy, training, and community-level initiatives can enhance youth empowerment. The study addresses the rural and urban settings as well to give a thorough picture of the digital preparedness of the state.

Research Methodology
The research design explains the logical process that was used to research the degree of digital literacy and technological skills among young populations in the state of Karnataka. The purpose of the study is to discuss the current condition, enumerate the obstacles encountered, and suggest the measures to increase digital competence in the various parts of the state.

Research Design
The research design used in the study is descriptive and exploratory research design in order to give a clear picture of the current level of digital literacy of the youth. Such design will assist in the description of the population features of the sample and the identification of patterns and attitudes toward the learning of digital skills as well as the challenges associated with the process.

Area of the Study
The study was carried out in different cities and towns of Karnataka such as Bengaluru, Mysuru, Dharwad and Raichur. The selection of these regions was based on the socio-economic and digital diversity of the state.

Sample Framework
The target population will be young people aged between 18 and 35 years old, students, jobseekers, and   young professionals. The study sample of 100 respondents was developed using stratified random sampling; both rural and urban population were fairly represented.

Sources of Data
The research has a foundation on both primary and secondary data.

Primary Data:
It is gathered using a structured questionnaire and interviewing with the respondents.

Secondary Data:
The data collected was through research journals, government reports, publications by the Ministry of Electronics and Information Technology (MeitY), Karnataka Digital Economy Mission (KDEM), and other scholarly research on digital literacy.

Data Analysis Techniques
Descriptive statistical tools that were applied in analyzing the collected data included the use of percentages, mean scores, and frequency distributions. Patterns were interpreted using graphical programs such as bar charts, pie charts, etc. Interpretations of the interviews were also involved in qualitative nature to complement the quantitative findings.

Limitations of the Study
The research remained limited to a sample of 100 respondents and this may not be representative of the full population of young people in Karnataka. Data that was gathered was in self-reporting and this might have subjective bias. The representation of rural youth may have been compromised by underrepresentation of remote and marginalized regions because of the infrastructure difficulty.

Purpose of the study
Each of the respondents was made aware of the study objective and fully their involvement was voluntary. Anonymity ofresponses was ensured and data were only applied to the academic and research purpose

Data Analysis and Interpretation

Table 1: Demographic Profile of Respondents (N = 100)

Demographic Variable	Category	Number of Respondents	Percentage (%)
Gender	Male	56	56%
	Female	44	44%
Age Group (Years)	18–21	32	32%
	22–25	38	38%

	26–30	30	30%
Educational Qualification	Higher Secondary	18	18%
	Undergraduate	52	52%
	Postgraduate	30	30%
Occupation	Student	62	62%
	Job Seeker	24	24%
	Working Professional	14	14%
Area of Residence	Urban	58	58%
	Rural	42	42%

Interpretation

The demographic information indicates that the research sample consists of equal representation of respondents in terms of gender, age and education levels. Most of the respondents are students (62%), and it means that students in educational institutions constitute the major group that is using digital technologies. An urban respondent (58%) is a little more than the rural one, as urban areas have more access to digital devices and the internet. The distribution also makes sure that there is enough representation to make comparative analysis between rural and urban communities.
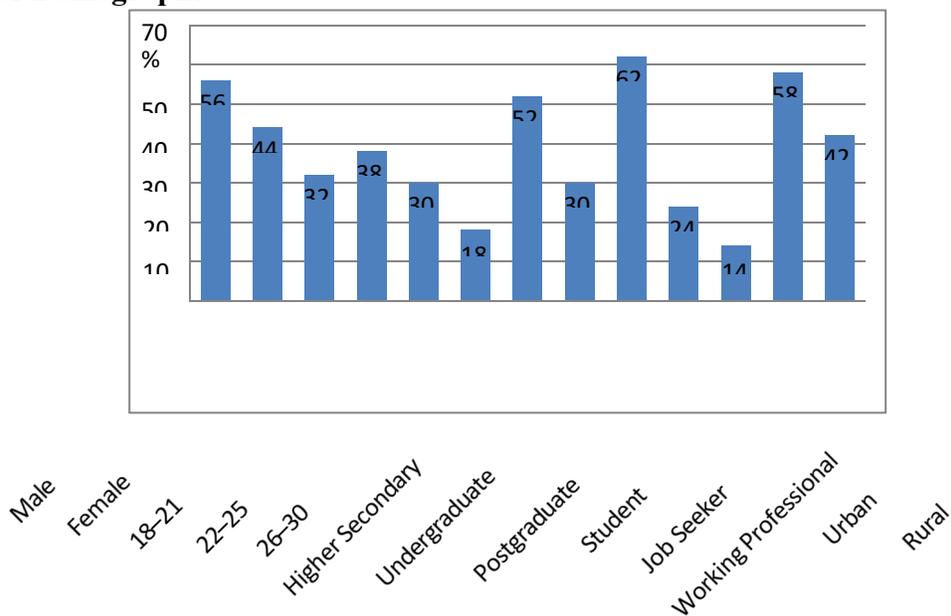
Fig.1 Demographics

Table 2: Awareness of Digital Literacy Programs

Program Name	Aware (%)	Not Aware (%)
Karnataka Digital Economy Mission (KDEM)	36	64
PMGDISHA (Pradhan Mantri Gramin Digital Saksharta Abhiyan)	42	58
NGO-led Digital Training Initiatives	28	72

Interpretation
Digital literacy programs, both led by the government and NGOs, are still rather less known. This shows the existence of a communication and outreach break in digital empowerment programs, especially in rural areas.

Correlation Analysis
The correlation analysis was conducted to establish the level of relationship between the demographic and technological factors that are selected to determine the levels of digital literacy among the youth in Karnataka. The degree and direction of the relationship between variables were measured by the Pearson correlation coefficient (r).

Table 3: Variables Considered

Independent Variables	Dependent Variable
Education Level	Digital Literacy Level
Access to Digital Devices	Digital Literacy Level
Internet Connectivity	Digital Literacy Level
Area of Residence	Awareness of Digital Literacy Programs

Statistical Method Used
The Pearson Correlation Coefficient (r) was calculated using SPSS to measure the linear relationship between pairs of variables. The value of r ranges between –1 to +1, where:
+1 = Perfect positive correlation 0 = No correlation
–1 = Perfect negative correlation
The following scale was used for interpretation:
Table 4

r-value Range	Correlation Strength
0.00 – 0.19	Very Weak
0.20 – 0.39	Weak
0.40 – 0.59	Moderate
0.60 – 0.79	Strong
0.80 – 1.00	Very Strong

Table 5: Results of Correlation Analysis

Variable Pair	Correlation Coefficient (r)	Significance (p-value)	Interpretation
Education Level & Digital Literacy Level	0.68	0.001	Strong Positive Correlation — higher education increases digital skills
Access to Digital Devices & Digital Literacy Level	0.74	0.000	Strong Positive Correlation — better device access improves literacy
Internet Connectivity & Digital Literacy Level	0.59	0.003	Moderate Positive Correlation — stable internet supports learning
Area of Residence & Awareness of Digital Programs	0.48	0.007	Moderate Correlation — urban youth show greater awareness

Fig. 2
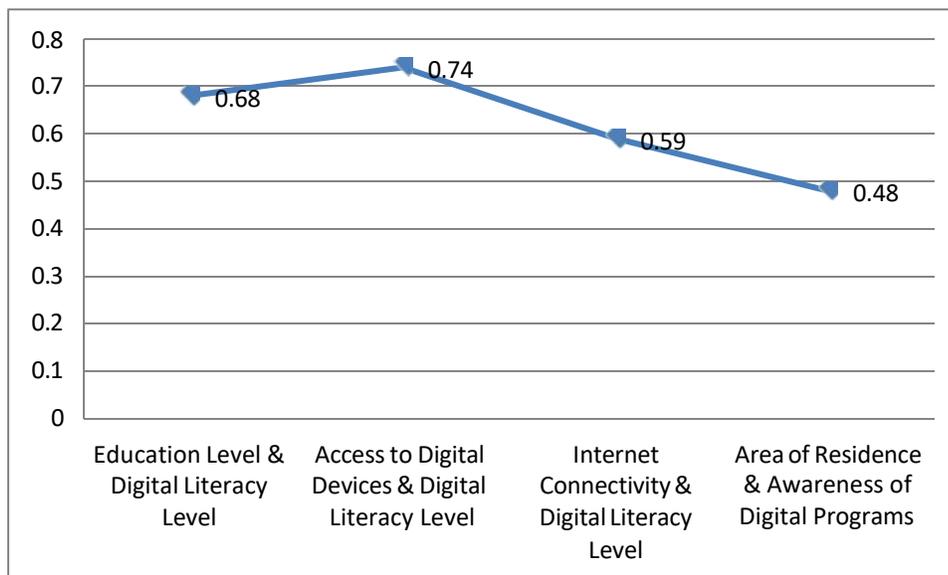
Interpretation of Results

Correlation Analysis Objective:
•   Test the connection between the level of digital literacy and educational qualification.
•   Determine whether the digital devices and internet connectivity are a key factor in digital skill proficiency.
•   Find out whether the area of residence (urban/rural) is associated with knowledge

about the digital literacy programs.
Digital literacy and education level have a strong positive correlation (r = 0.68). This means that younger
individuals who are more educated are more skilled in digital tools and technologies.
The most significant correlation (r = 0.74) was observed between the access to device and digital literacy, indicating that the possession of digital devices is a significant source of skill development.
There is moderate correlation between internet connectivity and digital skills (r = 0.59), which means that not only stable access but also connectivity enhances digital skills acquisition.
The residential area has a moderate relation of 0.48 with program awareness indicating a notion that urban youth are more exposed to digital programs than rural youth.

Chi-square test analysis
Purpose of the Test
The Chi-square (χ^2) test was conducted to identify whether there exists a significant association between selected demographic variables and digital literacy among youth in Karnataka. It is a non-parametric test used to analyze categorical data and determine if the observed distribution differs significantly from what is expected.

Statistical Formula
$\chi 2 = \sum \{(O-E)2/E\}$

Where:

O = Observed frequency
E = Expected frequency χ^2 = Chi-square statistic

Table 6: Test Details

Test Parameter	Value
Level of Significance (α)	0.05 (5%)
Degrees of Freedom (df)	(r - 1) × (c - 1)
Statistical Tool Used	SPSS Version 26
Decision Rule	If p < 0.05 → Reject H$_0$; If p > 0.05 → Fail to Reject H$_0$

Table 7: Results of Chi-Square Analysis

Variable Pair	Calculated χ² Value	df	p-Value	Result	Interpretation
Area of Residence × Level of Digital Literacy	9.48	2	0.009	Significant	Digital literacy levels differ significantly between rural and urban youth.
Education Level× Awareness of Digital Literacy Programs	11.63	4	0.021	Significant	Education level influences awareness of digital programs.
Gender × Access to Digital Devices	1.72	1	0.189	Not Significant	Gender does not significantly affect access to devices.

Interpretation

The first hypothesis demonstrates the existence of significant correlation between area of residence and digital literacy, which means that more educated youth is more digitally literate, probably because the youth has more access to infrastructures and connectivity. The second hypothesis indicates that digital awareness is significantly influenced by the level of education, where higher education levels are associated with the awareness of digital training programs by the government or other non-governmental organizations. The third hypothesis indicates that there is no significant difference in the access by male and female respondents to the digital device, which would mean that the gaps between gender in accessing digital devices are becoming smaller in the youth.

Findings

In this study, it is determined that despite the high level of basic digital awareness among young people in Karnataka, there is low level of advanced technological skills. The young people in cities are digital savvy as compared to those in the rural areas because they have access to more resources and education. This is because the primary obstacles to enhancing digital literacy are low infrastructure, expensive training, unfamiliarity with existing programmes, and the low incorporation of digital learning in the academic syllabus. It was found also that the institutions who had incorporated the training on digital literacy in courses generated more assertive and marketable graduates

Suggestions

The paper recommends that digital literacy training programs must be introduced as a compulsory part of secondary and tertiary education throughout Karnataka. Education institutions, government institutions, and technology companies can form partnerships that facilitate the teaching of digital skills by providing real- world workshops, internships, and certification programs. The government ought to enhance people public digital centers, enhance broadbanding

facilities and provide subsidies to low-income earners to embrace the use of digital technologies in entrepreneurship and innovation.There is a need to carry out awareness campaigns to educate the youth on safe internet practices, cybersecurity and the use of digital tools in entrepreneurship and innovation. The local community centers and NGOs can also be of significant importance as they can arrange the grassroots level digital boot camps in rural areas. There must be special focus on gender inclusivity in order to provide some equal opportunities to young women within the digital environment.

Conclusion

The paper summarises that the improvement of digital literacy and technological skills among the youth in Karnataka is crucial, as far as the inclusive socio-economic growth and sustainable development are concerned. Although the state has attained a lot in technological innovation, disparities in access, awareness and training continue to be a barrier to full inclusion of youth, particularly in the rural areas. To create a digitally empowered generation that can address the challenges of the digital future, there should be a concerted effort by policy makers, educators, industry partners, and community organizations in ensuring that the youth are empowered through digital literacy to spur innovations, civic participation and entrepreneurship, which are some of the pillars of Karnataka to continue playing a leading role in the digital transformation journey in India.

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