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EFFECT OF LITERACY AND NUMERACY DRIVE ON STUDENTS' ACADEMIC ACHIEVEMENT IN PUNJAB

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ABSTRACT

The study was structured to explore the effect of literacy and numeracy drive on students' academic achievement. The current study was based on a quantitative correlational survey research design. The literacy and Numeracy Drive Questionnaire for Teachers (LNDQFT) was used to collect data from public primary school teachers in Lahore Punjab. The content validity was ensured through five literacy and numeracy drive education practitioners and the reliability was calculated through Cronbach Alpha's score; .865. The study sample consisted of 208 teachers selected through a simple random sampling technique. Academic achievement scores of grade three students were obtained from the Punjab Information Technology Board (PITB). The collected data were analyzed employing Pearson correlation and regression to explore the phenomenon. The results of the study were statistically significant but showed a weak positive effect of literacy and numeracy drive on students' academic achievement. The regression analysis model demonstrated a statistically significant but weak positive effect of literacy and numeracy drive on students' academic achievement. Based on the results of the study, it was recommended that the government may provide human and material resources to enhance literacy and numeracy drive for beginner learners. Teacher training institutions may provide training to primary school teachers to improve literacy and numeracy drive that was associated with students' lifelong learning and academic achievement. Head teachers facilitate teachers to link literacy and numeracy drive and students' academic achievement according to the local context. Teachers concentrate on contemporary teaching strategies to link literacy and numeracy drive with students' academic achievement.

Keywords: Literacy and Numeracy Drive, Primary Level, Students Academic Achievement

INTRODUCTION

The ability to read, write and calculate is a basic liver for future learning. Literacy and numeracy contribute to a range of contexts and for a variety of purposes. The definition of literacy varies from country to country depending on the content and age of the learner. The literacy definition changes with changes in census reports in Pakistan. According to the first census of Pakistan in 1951 a person who could read a clear print in any language or could read the Holy Quran is considered as literate (Shahid, 2016). Up to now, seven censuses have been completed in Pakistan, and seven different literacy definitions recommended. The literacy definition is womb-to-tomb. The existing 2023 census literacy definition was the ability to read and write a simple paragraph in any language along with basic mathematical calculations (Government of Pakistan, 2017).

Education is a fundamental right of every individual to ensure sustainable development. Several international conventions recognized the right to free compulsory primary education for all to eliminate poverty, crime, social evils, and extremism in the world. Sustainable Development Goals (SDGs) indicator four is related to quality education. Quality education is a critical component of societal development, and LND results reported low-quality education in Pakistan particularly at the primary level. One of

the initiatives of quality education is literacy and numeracy skills. The international commitment to enhancing basic literacy and numeracy skills scores shows the importance of such initiatives (Government of Punjab, 2019; UNESCO, 2004).

Literacy is the ability to understand, read, write, create, interpret, and communicate in a specific language in varying contexts (OECD, 2013). Literacy is the ability to read, write, and understand the relationship between sound and written words. Literacy is the ability to use communication skills for the economic development of individuals and communities through better living opportunities (Keefe & Copeland, 2011). Numeracy is the ability to use numbers for daily life problem-solving. Numeracy skills include the identification of numbers, calculating, subtracting, grouping, and analytical strategies in everyday life (Macqueen et al., 2019). Literacy and numeracy included a large range of skills from reading, writing, and basic arithmetic to logical reasoning, interpretation of communication, and mathematical problems in early life (Archer & Huges, 2011).

Literacy is a multidimensional and dynamic concept that goes beyond the ability to read and write. It involves a set of skills that enable individuals to engage with information in various forms of communication (UNESCO, 2004). Literacy is an important skill for children to open global opportunities to gain new knowledge, enjoy literature, and shift from one language to a second language (Bernhardt, 2000). Literacy plays a pivotal role in enabling individuals to be learners in development and in lifelong learning. Digital, financial, and media are basic forms of literacy. Digital literacy involves creating, navigating, and evaluating digital content, media literacy refers to understanding and interpreting various forms of media; news, articles, advertisements, and social media while financial literacy includes management of money, budgeting, saving, and investment. Literacy extends traditional print-based texts to digital and media literacy in today's digital era (Ghani 2021; Keefe & Copeland, 2011).

Literacy and numeracy are two primary elements of early learning (Ghani, 2021). Literacy and numeracy refer to the ability to read, write, and calculate simple symbols, digits, words, sentences, and texts, with understanding at a normal speed, and control everyday life problems related to gender sensitivity, health, ethics, citizenship, and technical know-how to improve life and society (Archer & Huges, 2011; Boudard & Jones, 2003; Velardo & Drummond, 2017). Acquisition of early academic competencies such as reading and mathematics is important for academic development and career success (Jordan, et al., 2003).

Literacy and Numeracy Drive (LND) is a real-time online system developed to enhance the quality of education by measuring grade three students' learning outcomes through tablet-based assessment and evaluating the availability of essential facilities in schools (PITB, 2018). The LND program was launched formally to improve basic literacy numeracy skills in Urdu, English, and mathematics. LND was officially launched in Punjab Pakistan, in 2015 with the support of the School Education Department (SED), under the support of the Program Monitoring and Implementation Unit (PMIU) Review of Punjab Education Sector Reform Program (PESRP) from Grade 3 to 5. The major focus was ensuring basic reading, writing, and mathematical operations enhancement of early learners (Government of Punjab, 2019). The areas of SLOs for English and Urdu covers sentence completion, comprehension, and three-digit addition, subtraction, multiplication, and division for mathematics. Reading comprehension is one part of LND content. The MEAs conducted on-spot assessment with tablet application of students (PMIU, 2023).

Continue support of the Punjab education department and role of Monitoring and Evaluation Assessments (MEAs) are key factors to make LND successful and effective at classroom level. The LND apps are carefully aligned with the state-provided SLOs. The results from MEAs are actively utilized. The teaching infrastructure is well-equipped, including the availability of tablets. Punctuality and responsibility among teachers in carrying out LND derive indicators (Haider, 2021; Khalid et al., 2019; Shakil, 2020).

Professional development of teachers and teaching materials support is essential for LND implementation (Pollock, 2001). Students taught by professionally trained teachers had improved

reading outcomes reading, comprehension, vocabulary, spelling, and fluency (McCutchen et al., 2002). Teachers' training influences academic achievement through effective pedagogical practices (Gore et al., 2017). A lack of proper teacher training hinders students teaching (Rahman, 2017). The LND influences the pedagogical skills of teachers and curriculum (Imran et al., 2021). The textbooks were designed to align with the SLOs of LND. Teachers were provided with training regarding LND indicators, instructional materials, and physical facilities and infrastructure were provided for effective LND implementation. Physical facilities are essential for literacy improvement and literacy programs in Pakistan face many challenges. The LND may focus other than reading and writing skills on listening and speaking. LND assessment is to gauge the attainment of SLOs. Teachers' teaching methods of Urdu, English, and mathematics are less content-based and less aligned with LND new version (Mariam et al., 2021; McGrath, 2002; Shami & Saber, 2006)

The LND assessment process takes almost 5 minutes per student and it is easy for students in all subjects to complete the assessment. The outcome of LND assessments from all Punjab public schools are shared with the school education department via the online dashboard of program monitoring implementation unit (PMIU) version 11 LND assessments implemented from 28 August 2023. SLOs of English, Urdu, and Mathematics are included in this version, the number varies from 25 to 22 (Government of Punjab, 2019). The LND assessment has undergone several updates and versions since its inception, reflecting the commitment to improvement. A slight betterment was noticed from previous years but still, a lot of efforts are needed to improve literacy and numeracy skills at the national and provincial level.

Teachers less focus on activities and practice of LND content (Ishaq et al., 2020). LND assessment was less efficient due to several problems at the primary level. Haider (2021) reported that LND applications were less effective due to problems with English content SLOs, MEAs monthly indicators, learners' mother language, assessment procedure, and High expectations for SLOs. It is difficult for teachers to use resource packs (Haider, 2021). Children are facing problems in basic literacy and numeracy skills. Ishaq et al., (2020) identified problems with the usability of mobile apps, functionality of tablets, and assessment procedure. Literacy programs influence the reading, writing, and numeracy skills of learners. Learners face difficulties in reading newspapers and sign boards. Numeracy positively influences in addition, subtraction, multiplication, and division during calculation (Ali et al., 2012). Lack of learning deficiencies during the early year's influences academic progress and motivation that leads to a lack of achievements in future life of learners (Archer & Huges, 2011).

Academic achievement refers to content-area achievement as measured in English, Urdu, and mathematics. The government has introduced LND test system at the primary level alongside the provision of additional educational facilities. LND are linked with the curriculum and SLOs-based assessments were arranged for up to grade three learners. Literacy and numeracy skills are not just skills but also influential for quality learning of reading, writing, and mathematics for quality of life, personal well-being, national stability, and prosperity among individuals (Archer & Huges, 2011). The LND improves quality education at the primary level through mastery of basic literacy skills. Literacy remains a challenge for individuals and communities globally (Aleem & Irshad 2023: Ali et al., 2012). A series of reforms undertake to enable the public education sector to improve its performance in Punjab.

Objectives of the Study

The objectives of the current study were:

1. To find out the relationship between literacy and numeracy drive and students' academic achievement.
2. To determine the effect of literacy and numeracy drive on students' academic achievement.

Conceptual Framework

A conceptual framework for this study was structured to depict the effect of literacy and numeracy drive on students' academic achievement. The framework included LND indicators, resources, SLOs, availability of instructional and evaluation materials, monitoring

results utilization, and their influence on students' academic achievement at the primary level in Punjab.

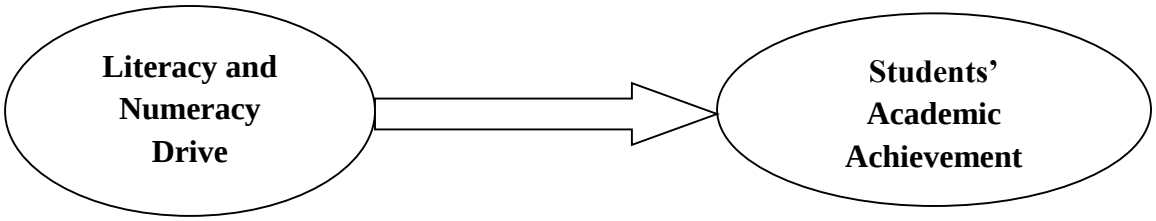

Figure Conceptual Framework

Fewer studies were designed to measure LND's influence on students' academic achievement in Punjab. This study represents a comprehensive review of the effectiveness of the LND program, serving as a foundational work for future studies.

Literature Review

Indicator four of Sustainable Development Goals (SDGs) is related to quality education and quality education linked with LND which has several aspects of foundational and functional skills, handling data, ensuring equitable education, and better educational outcomes. To achieve the target of SDG sufficient resources and effective educational strategies were used to eliminate or reduce illiteracy at the primary level in Pakistan. Literacy and numeracy are important initiatives. Literacy is a prime skill critical for personal, social, and economic development that involves the ability to read, write, speak, analyze, and transfer information. Numeracy is the ability to understand and use simple mathematics in daily life (Government of Punjab, 2023; Shomos, 2010; UNESCO, 2004).

The importance of literacy and numeracy is evident in their transformative influence on individuals and society. The consequences of poor literacy and numeracy skills extend to high school, where students with deficiencies struggle in choosing career fields and professional life. Early development of these skills correlates with better performance in elementary and middle schools, increased chances of reaching higher education, and improved prospects for success in life (Khakwani et al., 2023). Literacy and numeracy have a strong relationship and are essential elements of human capital (Shomos, 2010). Achievers of literacy and numeracy skills during early schooling years have more chances to reach secondary and high secondary school education (Marks et al., 2000; Harun et al., 2021). The sociolinguistic perspective of literacy skills emphasizes reading that involves learners, motivation, engagement, and self-efficacy. There are other three stages of reading literacy development with specific components vocabulary development, word recognition accuracy, fluency, and comprehension (Kennedy et al., 2012; Shakil, 2020). Fluency in reading improves reading comprehension while writing skill involves a symbolic process that arises from independent expression (Leppanen et al., (2008). The comprehension reading means that the readers used previous understanding to get new knowledge of matter through his/her reading. Reading comprehension helps to promote content understanding of learners (Hudson, 2021). Children with better early reading skills perform better in middle and elementary schools (Duncan et al., 2007). Reading comprehension enhances students' grades as understand complex content. Reading about understands written texts that involve perception, thought, and attention. It is useful for developing recognition and comprehension (Ziegler & Goswami, 2005). Reading ability is based on the learner's motivation and school resources. Motivated and trained teachers certainly select and use appropriate instructional materials during learning for their learners (Ajmal et al., 2023; Hedge, 2003).

The ability to read, write in any language, and perform basic mathematical calculations contributes to the academic empowerment of learners for future life. Literacy and numeracy are essential educational competencies for global citizens (Archer & Huges, 2011). Personal, social, and economic development involves the ability to read, write, calculate, analyze, and communicate information through foundational literacy skills. Literacy is a linguistic and social process and essential educational competence for global citizens. Skill and competence are two different terms. Skill refers to the ability to perform tasks and solve problems and competence is the ability to apply learning outcomes in a distinct specific content that includes functional aspects, interpersonal attributes, and ethical values (Cedefop, 2008).

Literacy is the competency to comprehend basic statements in a regional or national language, coupled with the ability to perform simple calculations. Literacy encompasses the capacity to comprehend, interpret, and critically evaluate information, empowering individuals to participate actively in society and make informed decisions (UNESCO, 2004).

Literacy plays a pivotal role in enabling individuals to fully participate in society, access information, and engage in lifelong learning. In today's digital era, literacy extends beyond traditional print-based texts to encompass digital and media literacy. Digital literacy involves navigating, evaluating, and creating digital content, while media literacy focuses on understanding and critically interpreting various forms of media, including news articles, advertisements, and social media (Ghani 2021; Imran et al., 2021; Rose & Meyer, 2002). The development of literacy skills significantly influences the academic success, employability, and well-being of individuals. It empowers individuals to access educational opportunities, pursue higher education, and acquire knowledge and skills necessary for meaningful employment. Literacy facilitates active citizenship by fostering informed decision-making, promoting civic engagement, and enhancing communication skills. Literacy encompasses different domains, such as cognitive, affective, socio-cultural, creative, and aesthetic levels, each contributing to a comprehensive understanding of the concept (Haider, 2021; Kennedy, Dunphy, Dwyer, Hayes, McPhillips, Marsh, & Shiel, 2012).

Numeracy is the ability to calculate simple numbers to understand others. Numeracy skills influence basic mathematical operations to communicate reliable results to others. Numeracy refers to the effective use of mathematics to meet the general needs of life and contribute to community and social life (Government of Austria, 2008). Numeracy refers to the use of mathematical sense in everyday application use. It involves the development of a child's own understanding and meaning-making abilities (David & Amy, 2015).

The LND is an organized effort to enhance the literacy and numeracy skills of individuals within a community. These drives involve educational programs, workshops, and resource distribution designed to help people improve their reading, writing, and mathematical abilities. The primary goals of LND are to raise awareness about the importance of these skills, provide necessary educational tools and support, and ultimately empower individuals to succeed in personal, academic, and professional contexts (Boudard & Jones, 2003; UNESCO, 2017).

The LND) program was launched with the intention of enhancing the basic literacy and numeracy skills of students to improve the quality of education at the primary level. The LND was launched in September 2015 to enhance literacy and numeracy skills among primary-level students in Punjab. This initiative aimed to replace conventional assessment to participatory methods to provide essential information on students' learning and involve teachers in evaluating and utilizing this information to enhance the teaching-learning process. The LND assessment system involves monthly tablet-based randomly selected students' evaluations of public sector schools to ensure a cost-effective and efficient process in Punjab. The results are linked to a cumulative ranking system, providing performance ratings at the district level. This continuous assessment involves a five-minute on-the-spot test for students every month. The results are disseminated to education administrators through an online dashboard and SMS alerts (Government of Punjab, 2019).

LND program has been in operation in Punjab since 2015 with the goal of evaluating school

performance and ensuring the delivery of quality education. Monitoring and Evaluation Assistants (MEAs) assess students based on Student Learning Outcomes (SLOs), which serve as a curriculum guide and quality indicators for teaching. These SLOs are incorporated into a set of tests in collaboration with the Punjab PITB, covering Urdu, English, and Mathematics. MEAs measure the progress of learners with the help of tablets on a monthly basis (Haider, 2021). Results are publicly reported on the website, and rankings are established on a district-wide basis. Strict actions are taken against schools and teachers with low performance. The LND program is currently a top priority in all primary schools in Punjab, with a primary focus on enhancing basic literacy and numeracy skills for quality education (Imran et al., 2021).

A study was framed by Habib et al., (2021) to identify the effect of LND on learning outcomes in the English language at the primary level in Punjab. The study was quasi-experimental in nature based on pre-tests and post-tests design. The purposive sampling technique was used to collect data from the sample of 60 students of three grades. Paired sample t-test was used to measure the difference between the control group and the treatment group. The results of a study showed a significant difference in SLOs-based language teaching and technology support in control and treatment group students' English language learning outcomes.

A study was structured by Raza et al., (2022) to compare the performance of public and PEF schools LND performance of district Muzaffargarh Punjab. A stratified random sampling technique was used to select a sample of 317 students. The collected data were analyzed using mean, standard deviation, and z-test. The results of z-tests showed no major difference between public and PEF school students' performance but public school students' performance was better than PEF school students.

A study was designed by Ishaq et al., (2020) to gauge the usability of mobile-assisted language learning apps for LND effectiveness in the public sector primary schools of Punjab. The nature of the study was mixed methods based on the survey method. The sample of the study consisted of 300 students of grade-3 selected using a random sampling technique. Questionnaires and interviews were used to collect data. The collected data were analyzed employing frequency, mean, and standard deviation. The results of the study revealed that students are less friendly users of mobile phones and hesitate to use them because many families have no smartphones in their homes. Only one tablet was available for each school to use LND applications for large strength of classes in a limited time and assessment results are less communicated to parents.

A study was framed by Bilal et al., (2021) to analyze students' achievement under the LND program in Punjab. The nature of the study was quantitative descriptive based on the survey method. A sample of 180 teachers teaching grade three LND subjects from six tehsils of district Faisalabad were selected through random sampling techniques. The collected data were analyzed using descriptive statistics. The study results declared that the LND program improves three grade literacy and numeracy achievement of students.

A study was framed by Aleem and Irshad (2023) to explore the perception of teachers regarding LND implementation effectiveness in Punjab, Pakistan. The study was quantitative descriptive research based on the survey method. The data were collected from 60 teachers through stratified random sampling. The study used descriptive data analysis. The findings revealed that there was a strong relationship between the understanding of teachers of LDP and its implementation effectiveness.

A study was designed by Ghani (2021) to determine the influence of LND on primary-level students writing skills in Punjab. The nature of the study was quantitative with a causal-comparative design. The data were collected from 400 students of primary school through a convenient sampling technique. The collected data were analyzed employing a t-test and ANOVA. The results of the study revealed significant differences in improved writing skills based on locale, furthermore, students' results differ regarding grades regarding writing skills.

Research Methodology

The current study was framed to explore the effect of literacy and numeracy drive on students' academic achievement at the primary level in

Punjab. The study was quantitative correlational based on the survey research design. The sample of the study was 208 teachers of public primary schools selected through a simple random sampling technique. Literacy and Numeracy Drive Questionnaire for Teachers (LNDQFT) was used to collect data from respondents. The content validity was ensured through five literacy, and numeracy drive education practitioners and the reliability was calculated through Cronbach Alpha's score; .865. After ensuring ethical consideration data LND data were collected from primary school teachers, and academic achievement scores of students were obtained from the Punjab Information Technology Board (PITB).

Data Analysis and Interpretation

For analysis the collected data were entered in SPSS software. Pearson correlation and multiple regression analysis were used to explore the phenomenon.

Table 1

Analysis of Pearson correlation

Variables	LND	SA
Literacy Numeracy Drive	1	
Students' academic Achievement	.195(**)	1

Table 1 delineated Pearson correlation analysis to perform a model of the relationship between Literacy and numeracy derive and students' academic achievement. The value of R, also known as the linear correlation coefficient, is 0.195. This value indicates the strength and direction of the linear relationship between the independent and dependent variables. In this context, an R-value of 0.195 suggests a weak positive correlation between LND and SA.

Table 2

Effect of LND on SA

DV		St. Er	Beta	t	Sig.
Students' academic Achievement	(Constant)				
	Literacy and Numeracy Drive	.071	.204	2.86	.00*

Dependent Variable: SA

Table 2 demonstrated the statistical findings of multiple regression analysis in order to analyze the effect of LND (independent variable) on SA (dependent variable). It claimed that there was a weak and positive effect of LND on the academic achievement of students with a Beta value of .204.

Conclusion

The current study was structured to find out the effect of literacy and numeracy drive on students' academic achievement in Lahore Punjab. Pearson correlation revealed a weak positive correlation between literacy and numeracy drive and students' academic achievement. Furthermore, multiple regression analysis claimed a weak and positive effect of literacy and numeracy drive on students' academic achievement.

Discussion

Literacy and numeracy drive at an early stage of education and provide a baseline for learners. The current study was executed to explore the effect of literacy and numeracy drive on students' academic achievement. Results of the current study of regression analysis explored a weak positive effect of literacy and numeracy drive on students' academic achievement, Pearson correlation analysis revealed a positive correlation between literacy and numeracy drive and students' academic achievement were consistent with the study of (Khalid et al., 2019) as result of the study shows positive effect and improvement in students' performance. The current study results were consistent with the study of (Ghani, 2021) in the terms it plays a

pivotal role in enabling individuals at the level of primary grades to differentiate significantly on the basis of English, Urdu, and Mathematics context to fully participate in society, access information, and engage in lifelong learning. The present study results were consistent with the study conducted by (Aleem & Irshad, 2023), there is a strong relationship between the implementation effectiveness of literacy and numeracy drive and students' academic achievement at the primary school level. The study is inconsistent with the study framed by (Haider, 2021) the LND application was not effective due to issues with SLOs in English content, MEAs monthly indicators, learners' mother tongue, non-supportive parental behavior, Punjab School Education Departments' high expectations for SLO achievement, and assessment procedure.

Recommendations

Based on the results of the study, it was recommended, that policymakers play their role in redesigning literacy and numeracy drive documents to meet the contemporary needs of learners. The government may provide the material and human resources to the institutions for better implementation of LND within the classroom and school. Teacher training institutions may develop new training modules regarding LND indicators for primary school teachers regarding effective implementation and lifelong learning of students. Teachers provide with training in English and Urdu effective modern teaching strategies to help learners in reading, writing and mathematical calculations without the use of a calculator. Head teachers are suggested to facilitate teachers for effective implementation of the literacy and numeracy drive in the local context. Teachers may play a major role in the enactment of the literacy and numeracy drive at the primary school level. Future research could explore these factors in greater detail to build a more comprehensive understanding of the dynamics influencing student academic achievement in the context of literacy numeracy initiatives. However, it is crucial to interpret study results cautiously and acknowledge the influence of other factors that may contribute to students' academic performance.

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