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Bridging Literacy Gaps Through Mobile Phones: Learners' Perspectives in Non-Formal Settings

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Abstract

The present study intended to determine "Bridging Literacy Gaps Through Mobile Phones: Learners' Perspectives in Non-Formal Settings". The objectives of the study were to a) explore students' perceptions towards use of mobile in enhancement of reading activities; b) sightsee students' views on mobile phone use to improve vocabulary; and c) explore students' perceptions towards use of mobile phone to enhance their pronunciation. This study employed a quantitative approach in which survey was utilized. The population of study comprised of students of Allama Iqbal Open University from B.Ed 1.5 years program. A randomly selected sample of 100 students was approached through an online survey. A self-developed questionnaire with extensive effort by focusing on the psychometric properties of the scale and sought expert opinion on it. This scale was based upon the objectives of the study. The tool was in 3-point Likert scale consisting of items on three dimensions of literacy (reading activities, vocabulary and pronunciation skills). Findings of the study indicated that most of the respondents agreed that mobile phone usage increased their reading literacy skills i.e. reading new books, reading vocabulary, downloading notes for reading, and upgrading reading pronunciation through the user-friendly mode of mobile. So, mobile devices are increasingly becoming the knowledge gateways to ensure universal useableness and user-friendliness that is necessary to cultivate inclusive digital learning platforms. However, those who did not agree with it exposed a critical digital divide that may be tackled by combining not only technology design but also ensuring policy reforms. Moreover, in distance learning, mobile phones may be encouraged by user-friendly, evidence-based, apps to enhance literacy skills.

Keywords: *Literacy Gaps, Mobile Phones, Basic Literacy, Reading Skills, Learners*

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Introduction

Technological revolution has had significant influences in every sphere of life. Education and literacy are also part of it. Literacy skills are developed through technological apps around the globe, especially in developing countries. Pakistan being a developing nation is struggling with its low literacy rates. The recent year 2025 is declared by the government as an educational emergency in which every possible measure is to be taken for uplift of literacy. In Pakistan, literacy is defined as:

> "Literacy is the ability to read and write. It is a basic skill and a foundation for lifelong learning, critical thinking, and active citizenship. Literacy is one of the important instruments for equipping people with minimum knowledge and skills that can help individuals to contribute effectively to the socio-economic development of the country……. At present, Pakistan is facing a significant challenge in achieving universal literacy with around 67 million illiterate individuals and 5.06 million out of school children of primary age (5-9) in the country. According to the Census 2023 data the overall literacy rate of the country is 60.6% (Male: 68 Female: 52.8), meaning that a significant portion of its population is unable to read and write. This low literacy level not only limits individual opportunities but also undermines national growth and prosperity. Furthermore, it is a matter of great concern that the literacy rate of Pakistan is almost static since 2011. Such an alarming trend in literacy needs immediate national response to the issue. Analysis by geographic area reveals that the literacy rates in rural areas are much lower than those of urban areas. Similarly, females have lower literacy than males in both rural and urban areas. While there appears to be a narrowing male-female disparity over time, Pakistan's overall literacy rate has remained stagnant at around 60% since 2011" (National Commission for Human Development, 2025, para 1-2).

At present, the country is implementing all possible ways to ensure high literacy rates. Use of mass media, "each-one teach-one" program, use of ICT, TeleSchool program and mobile learning are common examples under vision 2030 to attain Sustainable Development Goal 4 to establish quality education for all. In Pakistan, the mobile phone revolution has greatly changed the face of education, particularly in non-formal learning where the learning infrastructure is poor and accessibility to learning materials is low. Mobile learning (m-learning) has also proved to be a cheap, convenient and variable way of closing the gap in learning between

marginalized learners (Traxler, 2007). Mobile phones allow non-formal education (NFE) incursion that does not usually take place in formal classrooms to be mobile, personalized and immediate (UNESCO, 2013). Studies have highlighted the significance of mobile phones to accommodate geographically and socio-economically deprived learners. Aker et al. (2012) claims that mobile devices increase accessibility of educational contents, allow communicating with instructors, and make self-learning possible. In low-resource and rural settings, mobile phones have gained reputation as an instrument to lower both the digital and the educational gap by providing the learners with a chance to browse through the available content despite infrastructural issues (Ally & Tsinakos, 2014).

At non-formal levels, students tend to use mobile phones to access open educational materials, language programs and learning assistance via messaging and social network services (Gikas & Grant, 2013). Such practices are done in line with the learner-centered education which focuses on autonomy, contextual relevance and motivation (Kukulska-Hulme, 2010). In the perspective of learners, mobile phones are to be valued as convenient, cheap, and capable of promoting the process of constant education beyond the classroom. Students of non-formal education usually claim that mobile learning helps them to feel more powerful as they can control when, how fast, and what they can learn (Brown, 2015). Moreover, mobile phones promote informal peer-to-peer knowledge sharing, which is a pillar in most non-formal learning settings (Valk, Rashid, & Elder, 2010). In one study, Karakaya and Bozkurt (2022) conducted a study on the effectiveness of mobile phones and found its utility for students in their learning by using means of informal learning.

Nevertheless, the research also notes the difficulties which are seen by the learners. There are some problems that can facilitate mobile learning, including access to limited digital literacy, expensive data connection services, low network connection, and small screens amongst others (Isaacs, 2012). Also, usage of mobile technology can be influenced by cultural expectations and gender gaps especially in Third World countries (Gillwald, Milek, & Stork, 2010). These pitfalls raise issues of inclusive design and local interventions where a learner is taken into consideration of his or her socio-cultural background. In research by Mendeley (2021) mobile use was investigated in the context of mass communication. However, the demerits were associated with teachers and students. That's why it recommended that proper utility mechanisms of mobile phones may be introduced regarding instructors, students and administrators.

Mobile phones are also being perceived as effective equipment in bridge educational inequality in non-formal learning environments. Mobile learning has opened the door to skills building and empowerment among the learners of diverse backgrounds (working youth, refugees, women in remote regions, etc.) (UNESCO, 2018). Mobile learning is also adaptable, and can undergo contextual customization, and can be vital in a non-formal education program focusing on the adult education levels of literacy, vocational, and life skill development (Mbati, 2017). The programs like UNESCO Mobile Learning Week, or programs like BBC Janala in Bangladesh show how mobile-based education can reach underserved population effectively (Power & Shrestha, 2010). Students involved with this kind of program tend to complain of their being more motivated, self-efficacious, and have lifelong learning opportunities. In conclusion, the literature indicates that mobile phones play a critical role in closing the gap in learning among the learners in the non-formal educational settings. On the one hand, learners consider flexibility and access granularity that mobile technologies offer. On the other hand, issues of affordability, electronic expertise, and situational limits should be solved. Research and policy interest needs to be retained to ensure that learning strategies that can best serve the members in the non-formal settings are identified to become inclusive and sustainable through viable solutions. Findings of this study are supposed to be helpful to impart its role in shedding light on the importance of mobile phone use to improve students' learning in reading, writing and math's related tasks. The findings of the study may be helpful for teachers to encourage students to use mobile phones positively in their studies. The study may fill the gap, by exploring mobile effective use on students' literacy activities and community members may take help from the findings of this study and encourage their members for its positive use.

Statement of the Problem

The use of mobile phones is gradually becoming a compelling learning tool used to enhance teaching and learning in education. Its usage ensures flexible literacy acquisition by active engagement of learners. Literacy activities may improve and affect negatively by mobile phones. Students involved in literacy activities may encounter many challenges while using mobiles. So, it was necessary to explore their views on it. That's why this study aimed at "Bridging Literacy Gaps Through Mobile Phones: Learners' Perspectives in Non-Formal Settings".

Objectives of the Study

Objectives of study were to:

1. Explore students' perceptions towards the use of mobile in enhancement of reading activities.
2. Investigate students' views on mobile phone use to improve vocabulary; and
3. Find out students' perceptions about the use of mobile phones to enhance their pronunciation.

Procedure of the Study

The following procedure was followed in this study:

Research design. This study was quantitative, and survey was used.

Population. The population of the study consisted of postgraduate level students of AIOU from M.A and M.Phil. They comprised 7605 students (Autumn 2023) from Rawalpindi, Baluchistan and Islamabad Regions.

Sample. The sample was comprised of 100 students who were randomly selected.

Research instrument. A researcher developed a questionnaire with extensive effort by focusing on the psychometric properties of the scale and sought expert opinion on it. This scale was based upon the objectives of the study. The tool was on a 3-point Likert scale consisting of 14 items on three dimensions of literacy (Reading, Writing and Arithmetic skills).

Variables and Operational Definitions

Mobile Phone Use	It is defined as the use of a mobile phone, for example, including such activities as sending text message, navigating mobile internet, downloading or opening mobile apps, etc. in this study, students' mobile phone use was taken in terms of their studies i.e. reading, vocabulary and pronunciation activities.
Literacy Activities	Literacy means a person's reading, writing and mathematical calculations ability. It involves a person's ability to read text, use basic phone skills etc. In this study, the researcher focused on students' literacy activities, i.e. reading, vocabulary and pronunciation skills.

Data collection. Data was collected through WhatsApp group and emails.

Data analysis. Data was analyzed in terms of descriptive statistics (mean, percentages, graphs).

Results

Descriptive Results on Demographic Characteristics of Participants. This section is based on the demographic characteristics of the participants of the study.

Table 1
Demographic Information of the Respondents

Total Number of Respondents	Male	Female
87	15 (13.5%)	72 (86.5%)

The results of above table 1 shows that 13.5% respondents were male, and 86.5%% respondents were females. There was a gender imbalance which might be due to the reason that in non-formal settings females' participation is high as males in many cases receive formal education or stick to their businesses. The female participation is predominantly high which suggests that females NFE mobile programs and literacy-related NFE activities are more targeted towards vulnerable population including females. This can be due to the reason that females may have more flexible time to attend literacy classes on mobile phones.

Table 2
Marital Status of the Respondents

Total Number of Respondents	Married	Unmarried
100	34 (39.1%)	53 (60.9%)

The results of the above table 2 depict that there were more unmarried (60.9%) respondents and married (39.1%). This indicates that more unmarried respondents were engaged or available in literacy related initiatives and literacy-based activities. Possible reasons for inclusion of unmarried strata can be due to the reason that unmarried students may have less family responsibilities and they may be able to devote more time to literacy initiatives. Unmarried individuals may have more intrinsic motivation to learn possibly due to their future demands. They may want

to have more personal growth etc. On the other hand, married individuals may have more family responsibilities due to which they cannot foster on their potential learning engagement. Overall, this table concludes that unmarried participants are more likely to take part in literacy initiatives and mobile based literacy tasks. Married participants are more reluctant to participate in literacy activities as they may have completed their career demands or engaged in family responsibilities. That's why it's recommended to tailor literacy mobile learning programs for both populations married and unmarried. Apart from it, married-specific learning cohorts may be created by the designers of mobile literacy programs so that a more married population can be engaged in literacy activities through family learning models. There is also need for future researchers to investigate other factors which may help hinder literacy initiatives and mobile literacy programs of married populations including employment status, demographic influences, and number of dependents to influence literacy engagement etc.

Table 3
Age level of the Respondents

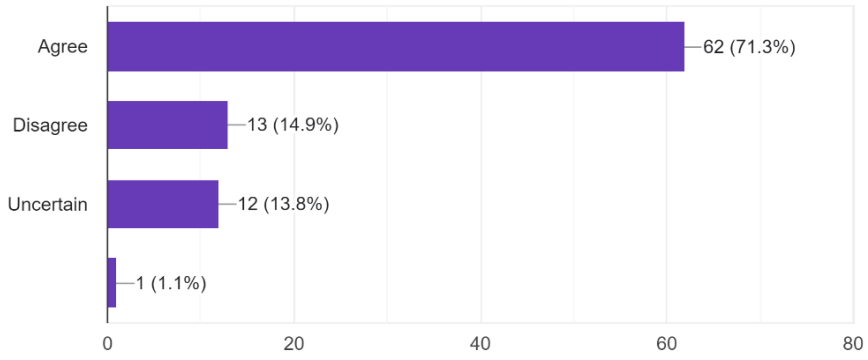
Total Number of Respondents	Adolescents	Adults
100	17 (19.0%)	69 (81.0%)

The results of the above table 3 show that there were more adults (81.0%) than adolescents who were 19%. So, majority of adults indicates the active involvement of target NFE population in mobile based literacy activities chiefly those carried via non-formal education (NFE) or mobile platforms. Possible reasons for inclusion of majority of adults can be that they are usually out of school and seek alternative learning pathways. They find it pleasure and convenient when taught through mobiles. They are also target-audience fit for NFE where there is a focus on literacy acquisition of out of school and adult population. So, it's a good sign that majority are adults for whom NFE and mobile literacy programs are designed. One reason may be that adolescents are usually going to formal schools so they may not have as much population out of school as adults who may have greater intrinsic motivation and access to mobile devices. This table concludes that adult learners are more seekers of literacy activities and engaging with literacy programs delivered through mobiles than adolescents. This is also aligned with the demand of the SDGs in which

adult literacy is prioritized through NFE and mobile-based solutions. The low enrolment of adolescents may be the result of their limited access to mobile phones as they may have access to mobile phones after maturity. So, this is recommended that adult literacy may be prioritized for both groups adolescents and adults by using a balanced approach. Age-appropriate mobile learning models and programs may be designed and published. For out-of-school adolescents who may not be reached through formal education, parallel youth-focused programs may be created within NFE by using mobile learning platform. Age-inclusive outreach may also be ensured by the stakeholders of NFE. Mobile literacy programs may be explored by future researchers in line with other functional literacy types, i.e. vocational education and skills training. There may be exploration of the barriers for adolescent participation, especially for those who are not in school.

Results

Figure 1
Mobile is user-friendly for developing reading literacy skills.

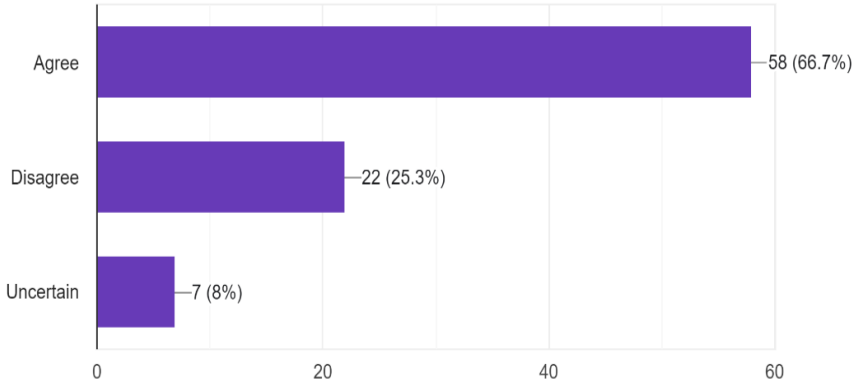


The analysis of figure 1 indicates that the majority of 71.3% respondents agreed with it. They indicated that they find it easy to use mobile phones for reading activities. It sheds light on the fact that mobile phones are not only accessible but also user-friendly for students, which helps them with reading tasks. This is also indicating towards the "global trends in mobile-first information consumption" which is effective in under-resourced where computer labs and full ICT infrastructure cannot be established.

Settings. However, a minority of informants informed of discomfort (14.9%) and disagreed with it. This little proportion may be associated with probable significant challenges associated with mobile phone use. It may include health issues i.e. eye strains, dizziness, small font size of mobiles etc. There are also chances of cognitive overload when students are using mobiles which disturb them i.e. notifications of different apps etc. Students may have lack of digital literacy skills or searching skills. So, these few disagreements may encounter many causes which lead them towards lack of reading on mobiles. The neutral stance (13.8%) mirrors ambivalence or provisional acceptance. These respondents may find it difficult or not difficult to use mobiles to enhance their reading skills. So, there is a fifty-fifty chance of both aspects. However, those who did not agree with it exposed a critical digital divide that may be tackled by combining not only technology design and educational outreach but also ensuring policy reforms. Overall, this figure shows promising support for mobile reading and concludes that a strong majority of respondents find it easy to enhance user-friendly mode to enhance their reading skills. So, mobile devices are increasingly becoming the knowledge gateways to ensure universal useableness and user-friendliness that is necessary to cultivate inclusive digital learning platforms.

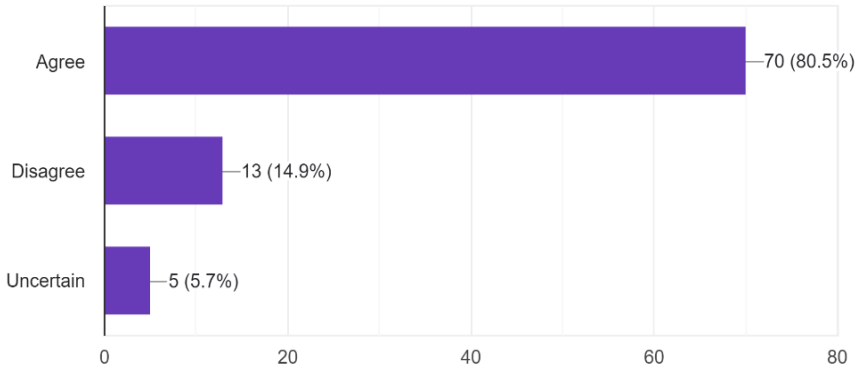
Figure 2

Mobile enhances reading literacy skills to read new books/reading materials



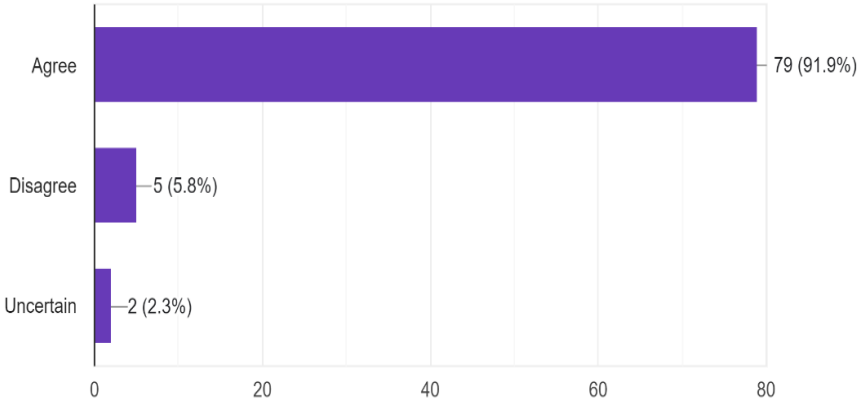
The analysis of figure 2 showed a positive correlation between mobile use and reading expansion as most two-thirds of the respondents (66.7%) agreed with it. They indicated that they find it easy to use mobile phones for reading new books and it's a valuable learning tool to improve literacy skills by providing them with an increased access to a variety of innovative reading stuff. This indicates that a wide range of open educational resources (OERs), soft books and e-libraries are playing a vital role in providing students with free access to trillions of files available online. Students can benefit from these reading resources while sitting in their homes or workplaces maximizing the informal, non-formal, distance learning opportunities and democratizing access to reading. These findings are also aligned with international initiatives i.e. UNESCO and World Bank which advocate to use mobile phones to enhance literacy skills. So, mobile phones can be used as a scalable literacy intervention to improve foundational literacy skills including reading. In the above figure, a sustainable minor response (25.3%) was received in disagreement. Over one-quarter of respondents did not agree with potential use/benefit of mobile to enhance reading skills by providing additional access to online books and other reading stuff. This disagreement may be attributed to possible reasons including lack of access to digital platforms, paid digital websites, lack of skills in searching, lack of digital literacy skills, health hazards, technological distractions etc. This suggests that reading on the mobile is just like putting students into an ocean of knowledge which does require training in swimming. Students without adequate training in searching digital content may be lost in other things, finding it boring and difficult reading activity. So, it is recommended that access may be enhanced through training for effective usage or efficacy. Few of 8% of respondents remained uncertain that might be affected by conditional or context-specific factors including age-specific reading stuff, need to specify reading tasks finding English difficult to understand etc. this neutral response indicates a lack of strong perception of respondents which suggests provision of potential support via targeted interventions. Overall, it indicated that mobile enhanced their reading new books.

Figure 3
Mobile phones enhance reading vocabulary on diverse study topics.



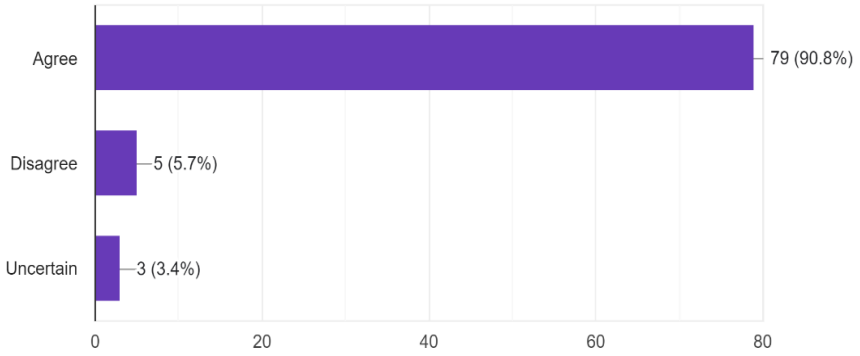
The analysis of figure 3 indicates a striking strong perceived impact of mobile phones on vocabulary growth of students. This exceptionally high level of agreement (80.5%) supports the transformative value of mobile learning in improving the vocabulary of respondents. Yet, to maximize this potential role demands intentional design, inclusive access, and proper students' guidance. However, 14.9% disagreed that mobile phones have helped them in building vocabulary relevant to different academic subjects. This group may find mobile learning difficult due to cognitive overload, language mismatch and inefficient designs of applications etc. which may not facilitate systematic vocabulary development. For this group, it is suggested to use a wide range of structured/scaffolded learning experiences so that their vocabulary retention may be optimized. A very small number of respondents (5.7%) remained uncertain. This group may be passive learners or lack to assess their self-developed vocabulary skills by using mobile phones. This indicates that metacognitive support may be provided to such users. Inclusively, it indicated that mobile enhanced their reading vocabulary of their study topics. Respondents indicated that they find it easy to use mobile for reading vocabulary of my study topics.

Figure 4
Mobile phone helps to download notes for reading



The analysis of figure 4 indicates an overwhelming positive response (91.9%) of respondents in agreement that mobile phones are de facto interface for academic content retrieval especially in distance learning where students are usually from diverse backgrounds and geographically dispersed. They indicated that mobile phones help to download notes for reading and respondents have seen mobile learning indispensable for accessing academic content. This content may be lecture-notes, e-books, Google Drive or OneDrive materials etc. However, minimal (5.8%) respondents disagreed with it and 2.3% respondents were uncertain. Overall, it indicated that mobile phone helps to download notes for reading. This proposes that mobile learning is not just supplementary but frequently used as prime tools for academic achievement, learning engagement and self-motivated autonomous learning.

Figure 5
Mobile phones improve reading pronunciation by using software



The analysis of figure 5 indicates that the majority of (90.8%) respondents agreed with it. They indicated that mobile phones provide a chance to improve reading pronunciation by using software. However, 5.7% disagreed with it and 3.4% respondents remained uncertain. Overall, it indicated that mobile phones provided chance to improve reading pronunciation by using software.

Findings

- The majority of (71.3%) of respondents agreed that they find it easy to use mobile phones for reading activities. However, 14.9% disagreed with it and 13.8% of respondents remained uncertain (figure 1).
- The majority of (66.7%) respondents agreed that they find it easy to use mobile phones for reading new books. However, 25.3% disagreed with it and 8% respondents remained uncertain (figure 2).
- The majority (80.5%) of respondents agreed that they find it easy to use the mobile for reading vocabulary of my study topics. However, 14.9% disagreed with it and 5.7% respondents remained uncertain (figure 3).
- The majority of (91.9%) respondents agreed that mobile phones help to download notes for reading. However, 5.8% disagreed with it and 2.3% respondents remained uncertain (figure 4).

- A majority of (90.8%) respondents agreed that mobile phones provide a chance to improve reading pronunciation by using software. However, 5.7% disagreed with it and 3.4% respondents remained uncertain (figure 5).

Conclusions and Recommendations

Based upon the findings of the study, the following conclusions are drawn:

1. Mobile enhances reading literacy skills of female distance learners. The female participation is predominantly high which suggests that females NFE mobile programs and literacy-related NFE activities are more targeted towards vulnerable population including females.
2. Unmarried participants are more likely to take part in literacy initiatives and mobile based literacy tasks. Married participants are more reluctant to participate in literacy activities as they may have completed their career demands or engaged in family responsibilities. That's why it's recommended to tailor literacy mobile learning programs for both populations married and unmarried. Apart from it, married-specific learning cohorts may be created by the designers of mobile literacy programs so that a more married population can be engaged in literacy activities through family learning models. There is also need for future researchers to investigate other factors which may help hinder literacy initiatives and mobile literacy programs of married populations including employment status, demographic influences, and number of dependents to influence literacy engagement etc.
3. Adult learners are more seekers of literacy activities and engaging with literacy programs delivered through mobiles than adolescents. This is also aligned with the demand of the SDGs in which adult literacy is prioritized through NFE and mobile-based solutions. The low enrolment of adolescents may be the result of their limited access to mobile phones as they may have access to mobile phones after maturity. So, this is recommended that adult literacy may be prioritized for both groups adolescents and adults by using a balanced approach. Age-appropriate mobile learning models and programs may be designed and published. For out-of-school adolescents who may not be reached through formal education, parallel youth-focused

programs may be created within NFE by using mobile learning platform. Age-inclusive outreach may also be ensured by the stakeholders of NFE. Mobile literacy programs may be explored by future researchers in line with other functional literacy types, i.e. vocational education and skills training. There may be exploration of the barriers for adolescent participation, especially for those who are not in school.

4. Mobile phones are easy to use for reading literacy skills as it is easy for students to find reading activities i.e. reading new books, reading vocabulary, downloading notes for reading, and upgrading reading pronunciation through the user-friendly mode of mobile. So, mobile devices are increasingly becoming the knowledge gateways to ensure universal useableness and user-friendliness that is necessary to cultivate inclusive digital learning platforms. However, those who did not agree with it exposed a critical digital divide that may be tackled by combining not only technology design and educational outreach but also ensuring policy reforms. Moreover, in the distance learning scenario mobile phones may be encouraged to use in the teaching learning process. Carefully evaluate and select mobile apps that are educationally sound and aligned with curriculum objectives. Prioritize apps that are user-friendly, evidence-based, and designed to enhance literacy skills effectively.
5. Mobile platforms expand access to free, additional and diverse reading materials thus proving an enabler of reading literacy. However, there may be issues of digital fatigue, content discoverability and access associated with its full effectiveness. This indicates the importance of supportive ecosystems as technology adoption does not equate to literacy expansion without appropriate training and guidance. That's why it is recommended to promote purposeful digital reading habits among students with supportive instructions to guide students. Moreover, there may be need to expand free e-book repositories to give more access to students to read materials. There is also a need to bridge the Digital Divide by distributing low-cost reading-friendly smartphones/tablets in under-resourced settings.
6. Mobile phones strikingly positively impact on vocabulary development of learners. So, mobile learning has the transformative value of improving vocabulary. It is recommended to use a wide range

of structured/scaffolded learning experiences so that their vocabulary retention may be optimized. Metacognitive support, intentional design, inclusive access, and proper students' guidance may also be provided to those users who are uncertain of its potential.

7. Inclusively, it indicated that mobile enhanced their reading vocabulary of their study topics. Respondents indicated that they find it easy to use mobile for reading vocabulary of my study topics.
8. Mobile learning is effective academic content retrieval to download notes for reading and indispensable for accessing academic content (lecture-notes, e-books, Google Drive or OneDrive materials etc.). This suggests that mobile learning is not just supplementary but frequently used as prime tools for academic achievement, self-motivated autonomous learning but also students' self-paced learning.

Recommendations and Future Implications

- Keeping in view the findings of the study it is recommended that future research may be done on mobile learning by keeping in view the impact of other intervening variables in nonformal education so that deep impact of sociological variables on mobile learning may be investigated.
- Mobile learning enhances students' pronunciation by using different software. These may be primarily through google interface where students can learn correct pronunciation of any word.
- However, it suggests that proper guidance to use pronunciation software may be provided to students as little proportion of respondents disagreed with it or remained uncertain.
- Future researchers may conduct experimental studies in nonformal education on mobile learning with diversified population and sample size.

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