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Extent of Applicability of Offline Mobile Application for Modules and Learning Packets

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ABSTRACT

The current challenge faced by schools in returning to the traditional 5-day school week stems from various factors such as limited classroom availability, a shortage of educators, and the ongoing preference of certain schools for remote learning options. It is imperative that all educational institutions proactively anticipate unforeseen circumstances, encompassing not only weather-related disturbances but also the broader realm of potential future incidents. This study examined the applicability of offline mobile applications for modules and learning packs. The study employed a descriptive-analytic design which included 2,456 students based on web-based monitoring of offline mobile app installation and 189 teachers who completed the questionnaire on mobile application applicability. In the fourth quarter of 2023-2024, kindergarten to junior high school students and schools without modules and learning packets in the District of Cardona. Offline mobile applications allow students to learn at their own pace and in different situations. These offline mobile applications also improve educational accessibility, engagement, and usability. The impact of technological advancements on the future of education is apparent, with offline mobile applications positioned to play a pivotal role in determining this trajectory.

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1. INTRODUCTION

Students now return to their regularly scheduled classes. Learners and teachers can begin teaching and learning within the confines of the classroom, thereby closing the knowledge gap caused by the unpredictability that occurred in the past. However, speaking in a more general sense, other schools are unable to return to the conventional 5 days of school because other schools do not have enough rooms to use, there is a shortage of teachers, and other schools continue to choose remote learning modes. Every school should be prepared for the possibility of unforeseen events, not just in the form of weather-related disruptions but also general unpredictability in the form of potential future occurrences.

As the commencement of the academic year approaches, the Department of Education (DepEd) continues to endorse and embrace the implementation of Department Order 12, series of 2020, which is also referred to as the Adoption of Basic Education-Learning Continuity Plan (BE-LCP) and School Learning Recovery Plan (SLRP). Various forms of distance learning continue to be accessible, while the Department of Education in Rizal province gradually reintroduces face-to-face classes and employs diverse learning modalities. Among these modalities, blended learning emerges as the most effective approach for acquiring knowledge during these difficult circumstances. As educational institutions progress and resume classes, the provision of learning resource materials remains essential for students, both within the confines of the classroom and in the context of blended learning, which may necessitate remote learning due to unforeseen circumstances. Nevertheless, there may not always be a correspondence between the number of modules and the number of pupils. The act of reproducing materials may contribute to an increase in the teacher's workload, and certain instances of reprinting may incur significant costs for reproduction. Given that each school now possesses a distinct quantity and assortment of modules, deviating from the original amount provided by the Department of Education (DepEd), there is a potential for a scarcity of learning resources.

In this scenario, it is advisable for the teacher to sequentially reproduce the modules, ensuring completion of all the modules. Given the imperative nature of this requirement within the educational setting, it is crucial to consider its impact on the instructional process for students inside the confines of the classroom. Emphasizes the learning materials are tool kits for learners, including methods, instructions, and other specifics under the supervision of responsible people and teachers. Modules are needed for schools to meet modalities (Verde and Valero, 2021). Even now, it would benefit students and teachers.

Based on Saidah and Damariswara (2021), an offline smartphone app-enabled his students to reproduce educational modules. The opportunity was visited by reviewing, Readiness Assessment Checklist, and Basic Education Enrollment Form. Families have phones but cannot survive online. According to Pereira-Dias and De Espíndola (2022), offline mobile apps should be beautiful, easy to navigate, and promote teacher-student communication (Jeng *et al*., 2010; Belyakova, 2022).

This study anchors to Ahillon's previous study, which is not non-BERF research, and seeks to determine the offline mobile app's applicability for modules and learning packets in the District of Cardona. It would be the Cardona sub-office's best practice to distribute modules and make information available to learners 100%. This study will employ descriptive analytics to see the applicability of offline mobile applications for Cardona learners (Ahilon, 2018; Ahillon and Aquino, 2023). This paper aligned with RLP and REDP regional priorities to accelerate learners by making schools more resilient and equitable through educational innovation and evaluation and combating disruptive innovations like exclusive and paid

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mobile technologies. DepEd-Rizal also analyzes learning modalities and 21st-century skill integration in the classroom.

In this study, the following questions were formulated: (i) What is the applicability of offline mobile applications for modules and learning packets in terms of the number of installed devices? (ii) What is the extent of applicability of offline mobile applications for modules and learning packets concerning: transmission, accessibility, and usability? (iii) What challenges and opportunities do offline mobile applications encounter?

2. METHODS

The study's primary objective was to determine the extent of applicability of offline mobile applications for modules and learning packets.

The study was conducted in the schools in the District of Cardona from elementary to junior high school during the 4th Quarter of School Year 2022-2023. Purposive sampling will be used to cater to the needs of the learners who lacked modules since the enrollment from the previous grade was bigger than the past enrollment. Thus, the completeness of the modules and their pages is not complete. Respondents in the study were all learners in the District of Cardona who have their Android cellular phones and selected teachers.

This research ran during the 4th Quarter of School Year 2022-2023 in the District of Cardona from Elementary to Junior High School. The data gathered is based on the questionnaire checklist that will be piloted to get the acceptability of the offline mobile application based on the transmission, accessibility, and usability. Teachers were the respondents on getting the extent of the developed offline mobile application. Many learners were based on the analysis of web-based monitoring of offline mobile application installation. Together with the Education Program Supervisor of the Learning Resource Management System, the Project Development Officer, and the Librarian of the Schools Division of Rizal.

3. RESULTS AND DISCUSSION

Based on the research conducted by Farsi (2021), mobile apps have been proven to be highly effective tools for enhancing knowledge and skills. Mobile apps are highly effective and valuable tools in the field of education due to their affordability, wide range of options, ability to function without internet connectivity, simulation capabilities, and adaptability for different learning styles (Kondylakis *et al*., 2020). Additionally, the study conducted by Smutny and Schreiberova (2020) revealed that the mobile application developed exhibited high accessibility, an appealing user interface, and strong pedagogical value for its users. However, we have identified several critical challenges in the mobile development process, including optimization, development timeline, technological and organizational hurdles, academic workload, and production costs.

In their study, Nami (2020) explored the concept of adequacy by examining how teachers perceive the potential impact of a mobile app in terms of providing comprehensive and practical learning experiences. They also investigated how the app can enhance students' competence development and self-regulated learning.

According to the research conducted by Abante *et al*. (2021), certain issues and concerns regarding offline modular learning were identified by students, teachers, and parents. The primary concerns raised by students regarding offline modular learning revolved around issues related to device usage accountability, access to saved files, potential health consequences, manual device operation, and the integration of complex topics (Coman *et*

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al., 2020). The primary concerns identified by school staff regarding offline modular learning, as stated by Abante *et al.* (2021), about the tablets/gadgets' quality and specifications, the technological aspect, course delivery, task completion, and parental resistance. Parents' concerns surrounding offline modular learning revolve around their children's lack of focus, the durability and longevity of the technology, their understanding of the content, their engagement with it, and their responsibility for it.

According to the research conducted by Agaton and Cueto (2021), in the concise examination of relevant literature and studies, the researchers of this study aim to explore the realm of offline mobile applications for educational resources. This study aims to explore the potential of offline mobile applications as a valuable learning tool, particularly for accessing learning resources.

A greater quantity of installed devices as shown in **Table 1** signifies a broader segment of the student and learner demographic possesses the means to access the educational materials offered by the program. This implies that the program can engage a wide-ranging and heterogeneous user base, hence enhancing the accessibility of instructional resources. In addition, the notion of inclusion, as manifested via both design and content, can provide support for a diverse range of learning requirements and preferences. The incorporation of inclusion into educational settings has the potential to positively impact a diverse array of students, encompassing individuals with varying learning styles and capacities. Therefore, a substantial number of installations might serve as a potential measure of user happiness and involvement.

Table 1. Number of installed devices.

Level	Frequency	Percentage
Grade 10	204	8.30
Grade 9	197	8.02
Grade 8	201	8.18
Grade 7	187	7.61
Grade 6	137	5.57
Grade 5	395	16.07
Grade 4	316	12.86
Grade 3	255	10.37
Grade 2	180	7.32
Grade 1	208	8.46
Kinder	178	7.24
Total	**2, 456**	**100.00**

The advent of mobile technology has brought about a significant transformation in the methods of information retrieval and learning. One of the most significant advancements in this context pertains to the rise of offline mobile applications designed for educational purposes (Tanil and Yong, 2020). These programs provide a novel and easily accessible means for students and learners to obtain educational resources without the need for a continuous internet connection (Santiago *et al*., 2021).

The accessibility of offline mobile applications for learning is a notable advantage. According to Jamil (2021), inclusivity encompasses efforts to bridge the digital divide, ensuring equitable access to educational resources for individuals residing in rural regions or facing constraints in connectivity alternatives. Offline mobile applications play a crucial role in expanding the reach of education to a wider and more diverse demographic by eliminating obstacles to accessibility. More so, Salhab and Daher (2023) said that offline mobile learning programs provide learners with an exceptional level of flexibility. Students

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have the autonomy to determine the timing and location of their engagement with the educational material, thereby customizing their learning experience according to their personal preferences and availability. **Table 2** shows the results of applicability of offline mobile application.

Table 2. Extent of applicability of offline mobile application for modules and learning packets concerning transmission.

No.	Transmission the Offline Mobile Application ….	Mean	Verbal Interpretation
1.	The android package toolkit (.apk) of the offline mobile application was passed just in time. *(Mabilis ipasa ang mobile application sa iba)*	3.97	Highly applicable
2.	Transferring of android package toolkit (.apk) can be passed without an internet connection. *(Maaring ipasa ang mobile application kahit walang internet)*	3.90	Highly applicable
3.	Android package toolkit (.apk) can be passed by others once it is already installed on the phone. *(Maari ding ipasa sa iba ang mobile application)*	3.78	Highly applicable
4.	Multiple transmissions of the android package toolkit (.apk) to beneficiaries are allowed. *(Maaring ipasa sa maraming users)*	3.86	Highly applicable
5.	The android package toolkit (.apk) can be transferred through ShareIt QR scanning and pairing. *(Maaring maipasa ang mobile application gamit ang ShareIt QR scanning at pairing)*	3.89	Highly applicable
	Total	**3.88**	**Highly applicable**

Scale: 4- 3.00-4.00 - Highly applicable, 3- 2.00-2.99- Moderately applicable, 2- 1.00-1.99 - Slightly applicable, 1- 0.99-1.00 -Not applicable.

Respondents were generally positive about offline mobile applications through APK files and their practical benefits. The response emphasized user empowerment, cost-effective solutions, educational enrichment, and community-driven ideas. However, respondents acknowledged the need for privacy, security, and legal precautions. Understanding and addressing these viewpoints can help promote safe and productive app sharing as technology continues to influence how we access and distribute mobile applications.

Based on the study of Topping (2023) they said that the advantages of flexibility and ease should not be disregarded. Offline mobile applications provide learners with the ability to assume agency over their educational pursuits. The ability to access learning materials offline is highly helpful for individuals with hectic professional schedules seeking to enhance their skills during their commute, as well as for students who wish to review lessons during their breaks (Fallatah, 2020; Fallatah and Ayed, 2023). It is in perfect accordance with the contemporary way of life when time holds significant value (Emerson *et al*., 2020).

Upon contemplation of this prevailing pattern, based on Sophonhiranrak (2021), it is imperative to recognize the significance of self-directed learning. Offline mobile applications facilitate autonomy by providing individuals with the ability to independently select their preferred learning content, determine the timing of their learning sessions, and decide on how they engage with the educational materials (Dhawan, 2020; Wiwin *et al*., 2022). The cultivation of a personal sense of ownership toward one's education contributes to the development of motivation and a mindset that values lifelong learning. This notion promotes the concept that education extends beyond the conferral of a degree and remains

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an ongoing, intrinsically motivated pursuit. **Table 3** shows the results of applicability of offline mobile application.

Table 3. Extent of applicability of offline mobile application for modules and learning packets concerning accessibility.

No.	Accessibility the Offline Mobile Application ….	Mean	Verbal Interpretation
1.	Is accessible through a QR Code available. *(May QR Code na makikita, magagamit at makukuha)*	3.87	Highly applicable
2.	Provide an application link to download. *(May magagamit na application link upang makakuha ng kopya)*	3.88	Highly applicable
3.	Android package toolkit (.apk) can be sent through email. *(Maaring isend ang (.apk) sa email)*	3.89	Highly applicable
4.	Downloading of the android package toolkit (.apk) is automatic once the QR Code, link, and email are clicked, tapped, and scanned. *(Kusang makukuha (.apk) mula sa QR Code, link, at email kapag ito ay naiklik, kalabitin, suriin gamit ang code)*	3.95	Highly applicable
5.	Android package toolkit (.apk) is easy to install. *(madaling kunin at iinstall ang (.apk))*	3.92	Highly applicable
	Total	**3.92**	**Highly applicable**

Scale: 4- 3.00-4.00 - Highly applicable, 3- 2.00-2.99- Moderately applicable, 2- 1.00-1.99 - Slightly applicable, 1- 0.99-1.00 -Not applicable.

The broad ramifications of offline mobile applications' accessibility, facilitated by QR codes, application links, and APK files, span various aspects such as user convenience, engagement, privacy, and cost-effectiveness. By adopting these methodologies, educators have the potential to enrich their educational offerings and expand their reach to a broader and more interconnected audience. The utilization of QR codes, application links, and APK files to enable offline accessibility of mobile applications carries several consequences that can greatly enhance user experiences and broaden the scope of mobile applications.

According to Focardi *et al*. (2019), users can quickly and easily install an application by scanning a QR code or clicking a link. They make it possible to install programs without having to scour the internet for them. This means there is less effort required for people to engage with a product or service, which increases the possibility that they will do so. (White *et al*., 2019).

Hayes *et al*. (2020) said that users in places with spotty network coverage can still install and use their favorite applications with the use of APK files. This has far-reaching consequences for users in unserved or underserved areas, as it guarantees that they will have access to the benefits of mobile apps regardless of their connectivity to the internet. (Liu *et al*., 2021).

Moreover, giving users access to APK files allows developers to distribute their products outside of E-Stores (Ibrahim *et al*., 2021). This means that it can have more say in the dissemination and maintenance of your apps without being subject to the policies and constraints of application stores. Even people who do not use or cannot access app stores can be reached by developers (Pektas and Acarman, 2020).

The extensive practicality of offline mobile applications in educational materials, emphasizing their usefulness as shown in **Table 4**, leads to enhanced accessibility, increased engagement, and improved user-friendliness in educational encounters. These educational

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programs enable students to assume control over their learning, granting them the freedom to study at their speed and in diverse settings. The increasing advancement of technology is expected to have a significant impact on the future of education by enhancing the effectiveness and accessibility of offline mobile learning resources. This development is anticipated to benefit learners from diverse backgrounds and abilities.

Table 4. Extent of applicability on the development of offline mobile application according to usability.

No.	Usability the Offline Mobile Application …	Mean	Verbal Interpretation
1.	Is user-friendly. *(Ang mobile application ay madiling gamitin at maunawaan)*	3.91	Highly applicable
2.	Menus are appropriate. *(Ang mga control sa mobile application ay maayos na gumagana)*	3.90	Highly applicable
3.	Serves learning tool in educating the indented beneficiaries. (ang mobile application as maaring maging kagamitang panturo sa mga gagamit nito)	3.95	Highly applicable
4.	Provides an accurate and precise information that satisfies needs of the users. *(Nagbibigay ng maayos at saktong inpormasyon ang mobile application na naayon sa pangangailangan ng mga gumagamit nito).*	3.97	Highly applicable
5.	The system is easy to use. *(Ang sistema ng mobile application ay madaling gamitin)*	3.95	Highly applicable
	Total	**3.94**	**Highly applicable**

Scale: 4- 3.00-4.00 - Highly applicable, 3- 2.00-2.99- Moderately applicable, 2- 1.00-1.99 - Slightly applicable, 1- 0.99-1.00 -Not applicable.

Based on the study of Amin and Sundari (2020) said that the high applicability of offline mobile applications in learning resources, particularly concerning usability, brings about several significant implications for the field of education and the overall learning experience. It was emphasized by Al-Nabhani *et al*. (2022) that offline mobile applications offer significant enhancements to usability by enabling tailored and adaptable learning experiences. Students have the autonomy to determine the timing and location of their educational interactions, customize their learning trajectories, and review resources as necessary. The versatility of the learning environment allows learners to effectively adjust their learning methods and preferences.

In the study of Baharuddin *et al*. (2023) that the prioritization of user-friendly interfaces by developers of offline mobile learning apps is aimed at optimizing usability. A positive user experience is facilitated by intuitive navigation, clear organization of material, and responsive design components. The user-friendly interface of the application allows learners to direct their attention towards the educational content, rather than encountering difficulties in navigating the app's features.

In the implementation of the study, opportunities and challenges have been visible based on the installation and validation of learning resources in the offline mobile application as shown in **Figure 1**. As the offline mobile applications were used to alter the incomplete modules and abrupt implementation of blended distance learning because of some environmental factors, the offline mobile applications have seen cost-effectiveness since schools, and especially teachers do not need to reprint modules that are lacking in each grade level and section. Teachers emphasized its effectiveness during the installation

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process as it also gave opportunities to let their learners and parents install the mobile application. Teachers and even parents observed the completeness of modules and learning packets from CLMD Pivot4a Modules and nationally adopted modules accessed through the LRMDS portal of the Schools Division of Rizal.

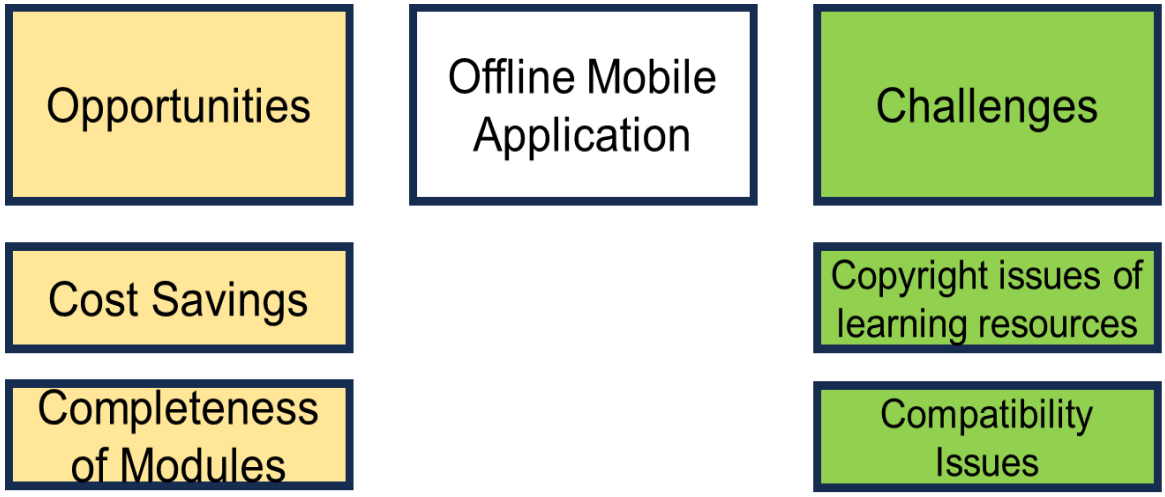

Figure 1. Opportunities and challenges of offline mobile application for modules and learning packets.

On the other hand, some challenges were seen during the implementation and applicability of offline mobile applications. First are the copyright issues, since the learning resources such as the modules and learning packets were not originally made by the researchers. Based on the technical assistance given by the district supervisor and LRMDS Supervisor, it was recommended that the notice to the users be indicated in each quarter of the offline mobile application which was immediately done by the researchers. Also, another challenge was seen which has something to do with the compatibility of the offline mobile application in various phones and operating systems. However, during the implementation of the study, it was oriented that offline mobile applications are only used with the Android operating system since collectively students used most Android phones.

The first study's objective was to determine the applicability of offline mobile applications for modules and learning packets in terms of installed devices, which is answered and shown in **Table 1**. Due to the larger number of devices installed, a larger proportion of students and learners can afford access to the teaching materials offered in the program. This means that the program can appeal to a large and diverse user base, thereby increasing the availability of educational resources. Integrating inclusion considerations into educational environments has the potential to have positive impacts on a diverse group of students, including those with varying ability learning levels. Therefore, a significant number of installs can serve as a potential measure of user satisfaction and engagement.

The extent of applicability of offline mobile applications concerning transmission, accessibility, and usability is the second objective of the study, which was answered in **Tables 2-4**. The majority of respondents are in favor of offline mobile applications that are accessed using APK files. Respondents cite user empowerment, cost-effectiveness, educational enrichment, and community-driven ideas as reasons for their support. Nevertheless, they recognize the importance of taking privacy, safety, and legal safeguards. Additionally, the accessibility of offline mobile applications via QR codes, application links,

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and APK files can improve user convenience, user engagement, user privacy, and cost-effectiveness. This strategy has the potential to improve the available educational options and to attract a larger target audience. Students can regulate their learning at their speed and in a variety of locations thanks to offline mobile applications that are incorporated into educational resources. These applications also improve accessibility, engagement, and user-friendliness. The future of education will be substantially influenced by the rapid development of technology.

Lastly, the opportunities and challenges were described. Installing and validating learning resources in the offline mobile application revealed study potential and limitations. As offline mobile applications were used to alter incomplete modules and abruptly implement blended distance learning due to environmental factors, schools and teachers saved money by not having to reprint modules for each grade level and section. Teachers praised its effectiveness during installation because they could let students and parents install the mobile application. Teachers and parents saw the fullness of CLMD Pivot4a Modules and nationally adopted modules on the Schools Division of Rizal's LRMDS portal. Offline mobile application installation and applicability also presented issues. The researchers did not create the modules and learning packages, so copyright difficulties arose. Based on technical help from the district supervisor and LRMDS Supervisor, the researchers promptly added user notices to each quarter of the offline mobile app. Another issue was offline mobile app compatibility with different phones and OS systems. Since students utilized most android phones, the study assumed that offline mobile apps were only used with android.

4. CONCLUSION

One of the noteworthy discoveries is that offline mobile applications provide students with the ability to assume control over their learning, facilitating the opportunity to learn at their preferred speed and in diverse settings. These applications also have a significant impact on enhancing general accessibility, engagement, and user-friendliness in the educational process. The impact of technological advancements on the future of education is apparent, with offline mobile applications positioned to play a pivotal role in determining this trajectory.

5. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirmed that the paper was free of plagiarism.

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