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Expanding Access to Education: Mobile Learning Solutions for Adult Learners

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Abstract. Many adult learners are not accustomed to online, blended, or hybrid learning, nor using different devices to acquire necessary skills and knowledge at their convenience. In this sense, mobile technology has the potential to enhance the critical thinking and collaboration skills of adult learners, foster deep learning, and facilitate teaching and learning on any mobile device, at any location and time. Public ABET centres in South Africa have not formally incorporated the use of mobile devices in teaching and learning, despite being aware of the benefits of mobile learning for adult learners. Consequently, this research study aimed to explore the use of mobile technologies for adult learners in the ABET sector in South Africa. This research study received support from the FRAME model, which advocates for the use of mobile devices in adult learning. An interpretive paradigm was used following a qualitative research approach. The researchers used a purposive sampling method to select adult learners, and data was collected through focus group interviews. Based on the research findings, it was indicated that mobile learning could be more beneficial as an alternative approach to teaching and learning for adult learners. As a result of these findings, several recommendations have been made to address the identified challenges and make good use of mobile learning for adult learners.

Keywords: mobile technology; mobile learning; adult learners; Framework for the Rational Analysis of Mobile Education; Adult Basic Education and Training

1. Introduction

Life is constantly changing in today's world due to the digital revolution, various pandemics such as COVID-19, climate issues such as global warming, and human issues, including the search for better opportunities, all of which have an impact on humans. In this regard, adults must continuously learn to stay up-to-date and relevant to engage with current political, economic, and

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social elements. The appropriate use of portable digital devices has expanded into daily activities for acquiring knowledge and supporting different educational institutions (Criollo-C et al., 2021). Accessing education and gaining knowledge and skills is no longer solely based on attending traditional in-person classes. There are now alternative options, such as using educational technology, to attend online classes using different devices such as computers, tablets, and mobile phones. The European Council viewed educational technology as a "*response to globalisation and the shift to knowledge-based economies*" (Cimermanova, 2009, p. 115). According to Ahmed (2022), online learning, supported by educational technology, is more effective than traditional learning because it offers flexibility and time.

It is a challenge not to include the use of mobile technologies in supporting adult learning. This challenge is even more pronounced for adult learners in rural areas who need to acquire certain educational levels to improve their livelihoods but do not know how to use mobile technologies for learning. Therefore, learning the technology to develop digital skills is necessary to address the challenges and enable the possibilities of successful mobile learning (m-learning). Adult learners can achieve personal growth, participate in professional development, and access learning opportunities when they learn how to use technology (Thompson, 2011). This is one way to expose adult learners to alternative ways of learning to provide educational skills, including the information and communication technologies (ICT) skills desired today and knowledge, as well as to support and empower them.

From the above, the study addressed the research question: *How can mobile learning solutions be effectively implemented to expand access to education for adult learners, particularly in rural and under-resourced areas?*

A literature review and theoretical framework will be discussed to address this question to provide context and background, followed by the research methodology and findings, before drawing conclusions and providing recommendations.

2. Literature Review

Face-to-face learning, also known as traditional learning, regards learners as having knowledge gaps that a teacher needs to fill with information because, in this type of learning, a teacher is usually in control of the learning process (Ananga & Biney, 2017). Unlike face-to-face learning, m-learning is described by Ozdamli and Cavus (2011) as a way of accessing learning content through mobile devices. Through mobile technologies, learners can access education from anywhere at any time because "*the core characteristics of mobile learning are ubiquitous, interactive, collaborative and instant information*" (Ozdamli & Cavus, 2011, p. 937). Mobile learning refers to learning that incorporates the usage of dominant technologies such as mobile phones or other handheld devices, such as personal digital assistants (PDAs), Ultramobile PCs, mini notebooks, or netbooks (Brown & Mbathi, 2015; Hashemi et al., 2011; Traxler, 2005) and is a learning-centred way to provide education at a distance.

Unlike a child learner, an adult learner is involved in a systematic learning process autonomously and comes voluntarily to the learning situation, be it informal or formal (Kapur, 2015). During and after the world pandemic of COVID-19, many people's livelihoods were in jeopardy, and it would be beneficial for adults to learn new skills and acquire knowledge to prepare for future opportunities that could arise. This means that adult learners must take advantage of the mobile devices they own to use them to acquire access to knowledge and skills. Since the pandemic, the ubiquity of mobile devices, online learning, and data availability have changed and provided new opportunities. African Union (2020) emphasizes the importance of equipping workers and learners with digital skills as a response strategy to mitigate the impact of the pandemic crisis. This is essential to enable their participation in the new normal. Acquiring knowledge and skills during this time is particularly crucial for adult learners, especially those in rural areas, as they are often marginalized from accessing education due to various factors, such as their geographic location. According to Wood (2022), adult education in South Africa continues to be under-resourced and marginalised. It has further been indicated that adult education in Adult Basic Education and Training (ABET) centres in South Africa faces challenges related to teaching and learning (Akintolu et al., 2022; Static, 2002). In South Africa, ABET provides adult literacy education and is deemed necessary as a base for work, training, and career progression (Aitchison, 2006). Challenges in ABET centres arise from limitations in service delivery in remote rural areas with low population densities, inadequate infrastructure, and declining funding. The education system has marginalised adult learners in mainly rural areas of South Africa, where few ABET centres are located far apart. Therefore, the adoption of m-learning for adult learners is of paramount importance to address such challenges.

As a result of not conveniently acquiring new skills and knowledge, adult learners are often not participating in major economic activities. In this regard, adult learners are responsible for enhancing their skill acquisition and knowledge and thus improving their livelihood by using mobile technologies for m-learning. Adult members of families must show "*moral and social, as well as material and economic functions, and provide the optimal framework for their children's well-being*" (Amoateng, et al., 2004, pp. 3,4). In other words, adults are the providers for their families. They provide structure, support, and direction to their households and cannot afford to fall behind due to a lack of knowledge and skills. This flexibility and usefulness of m-learning can assist adult learners in acquiring knowledge without having to leave their local areas or search for ABET centres, which may be far from their residences.

With face-to-face learning, adult learners must attend contact classes at a specific time and location. This kind of learning is generally less flexible than online learning as it cannot be accessed on demand (Greany, 2024). However, m-learning is possible because of mobile technologies that include different applications. Using mobile technologies, adult learners can access education without relocation. The study by Thompson (2011) suggests that using online

learning can help adult learners develop their higher-order thinking and knowledge attainment. The provision and acquisition of knowledge and skills for adult learners is never stagnant as it evolves with time and should now be at a level where mobile technologies support it. This process must continuously evolve with the technology, information, learners, and society to stay relevant and current.

Mobile technology as a learning tool draws its base from other educational technologies that "*can be traced back to the emergence of very early tools, such as paintings on cave walls*" (Nye, 2007, p. 1). The most current influential technologies in education include computers and other machines such as smartphones, laptops, tablets, virtual reality glasses, PDAs and servers, technologies that are "*mobile hardware technologies and ranked internet-based mobile learning tools*" (Yildirim & Varol, 2017, p. 37). Some applications such as WhatsApp, Facebook, X (formerly Twitter), and YouTube utilize the aforementioned technologies (Feiner, 2023). In a recent study, van den Berg and Mudau (2022) examined the use of WhatsApp as a communication tool to facilitate teaching and learning. They found that WhatsApp's speed and ease of use make it an effective platform for communication and sharing learning materials on mobile devices. However, they also noted drawbacks such as small screens and the potential for distractions.

Learning management systems (LMSs), such as Blackboard, Sakai, Moodle, and others, play a significant role in education. They are used by students, teachers, administrative staff, and IT personnel. LMSs support online collaborative groupings, communication among users, discussion, professional training, inclusive learning environment for academic progress, and reinforce the learning process (Bradley, 2020). LMSs can be used on mobile devices equipped with communication capabilities and may positively influence how learners learn (Nikolopoulou et al., 2023). Computers, including laptops, tablets, and smartphones, are essential and convenient for learning because they can be used online or offline (Kafle, 2010). In either way, they have the potential to support learning. For example, when computers are not connected to the Internet, they can be used for activities such as typing, preparing presentations, playing videos, coding, and various other tasks. When used online, mobile devices can be used for activities such as video conferencing, live chats, browsing the Internet, and uploading and downloading content over the Internet. According to Konig and Seifert (2020), the Internet determines moving from offline to online and vice versa, implying that online is virtuality and offline is reality.

According to Mayisela (2013), mobile technologies are mobile devices, computers, and wireless communication tools. It is also referred to as a broad range of wireless and mobile networks, mobile devices, the Internet, and facilitating activities (Xiaojun et al., 2004) that can be adopted for mobile learning. Mobile technology is a distinct category of technology because its application provides unique and distinct experiences compared to those provided by using fixed and stationary networks.

3. Theoretical Framework

According to Osanloo and Grant (2016), a theoretical framework is a structure that researchers can use to comprehend the significance of a study, the problem statement, the kind of literature to collect, the collection and analysis of data and the discussion of the findings. It is the structure that can hold or support a theory of a research study (Swanson, 2013). In other words, a theoretical framework comprises a theory or theories expressed by experts to give a hanger to data analysis and the interpretation of results (Kivunja, 2018). In this study, concepts are used to reinforce the research by aligning it with existing knowledge. To explore the phenomenon of the study, the Framework for the Rational Analysis of Mobile Education (FRAME) was used to support the study. The FRAME is about the interaction between mobile devices, the learner, and social aspects. "*In this model, the mobile device is an active component on the same footing as leading and social processes. Collectively and individually, learners consume and create information*" (Koole 2009, p. 26). In this study, the FRAME model suggests that adult learners could interact physically or virtually with other learners or teachers in their respective ABET centres. Adult learners can also use mobile devices to interact with information at any time.

The FRAME model was initially created to analyse mobile devices' effectiveness and impact on distance learning (Koole, 2006). The FRAME model defines m-learning as a learning process that is driven by the convergence of mobile technologies (considering the technical characteristics of mobile devices), human learning capacities (considering personal aspects of learning) and social interaction (considering social aspects of learning) (Koole, 2009). This model was developed to understand the m-learning process and different mobile devices as distance learning tools.

4. Research Methodology

According to Farooq (2019), research methodology is a systematic way to solve a problem and consists of a research design and methods consisting of broad design features, as well as various procedures and steps in research. The research methodology in this research study included the research design and methods. According to Creswell and Plano Clark (2007), research methodology involves not only collecting and analyzing data but also interpreting and reporting data in research studies.

The study used an interpretative paradigm (Kivunja & Kuyini, 2017) because it aimed to interpret and uncover perceptions and attitudes related to the use of mobile technology to support adult learning. Within this paradigm, the research approach most suitable was qualitative in nature. This approach is interpretive, humanistic, and descriptive due to the richness of the discussion, detail, and understanding of human experiences and reflections (Jackson et al., 2007; Yin, 2009). In this way, the meaning of the phenomenon is meant to be established from the views and experiences of the participants. In this case, the researchers were concerned with obtaining descriptions and explanations about the use of mobile technology in supporting adult learning from adult learners themselves rather than from external sources. Within a qualitative approach, this research

study utilized a phenomenological research type that was found suitable for the research process. The central tenet of phenomenology is understanding subjective consciousness to gain direct knowledge through the voices of the participants (Qutoshi, 2018). Research types involve using accepted methods and procedures to research a question or problem in detail to create new knowledge about it. This study's research methods were planned to include population and sampling, instrumentation, data collection techniques, and data analysis (McMillian & Schumacher, 2014).

The population in this study consisted of adult learners from ABET centres in two provinces in South Africa. From the population, purpose-sampling was used to select participants due to its systematic way of choosing participants based on the purpose of the research study (Tilbury, 2010). The sample consisted of 20 adult learners studying at four ABET centres, two from each province. The criteria for the purposive sampling of the learners and centres were all the learners who were doing Level 4 at the public ABET centres. ABET Level 4 is equivalent to Grade 9 and provides adult learners with basic general education learning. In this qualitative study, focus group interviews were instruments for collecting data. They made it possible for researchers to gather the necessary and relevant data for the research (Nieuwenhuis, 2007). The data collection technique included an exposure part that happened in the middle of the interviews, where a handout was given to participants, exposing them to m-learning and its related concepts. The purpose of this section was to give participants a clear understanding of mobile learning and technologies. Subsequent to the exposure part, related m-learning questions were asked.

Thematic analysis was used to analyse data from focus group interviews recorded on a digital audio recorder. Permission was asked from the participants to record the interviews. According to Braun and Clarke (2012), thematic analysis organises, identifies, and offers insights relating to themes or patterns of meaning in a dataset. Qualitative research quality is based on trustworthiness and is supported by forms of credibility, transferability, dependability, and confirmability. Lincoln and Guba (1985) called these the four criteria determining the qualitative research study's credibility, accuracy, and true value. These elements were considered and adhered to to achieve trustworthiness in this study. This research study addressed ethical issues such as obtaining informed consent from participants, protecting them from harm, and obtaining permission from the relevant ABET centres.

5. Findings and Discussion

Adult learners were selected to give their opinions on teaching and learning in association with technology and the possible adoption of m-learning in the ABET sector. First, participants' biographical information relevant to the research is presented.

Table 1: Profiles of adult learners

Province	ABET centre	Focus-Group	Participants	Level of learning	Age
North West (NW)	A (Public centre)	FG1	Participant 1	Abet Level 4	21
			Participant 2	Abet Level 4	18
			Participant 3	Abet Level 4	18
			Participant 4	Abet Level 4	22
			Participant 5	Abet Level 4	20
Gauteng (GP)	B (Public centre)	FG2	Participant 6	Abet Level 4	32
			Participant 7	Abet Level 4	21
			Participant 8	Abet Level 4	24
			Participant 9	Abet Level 4	20
			Particpant10	Abet Level 4	19
Gauteng (GP)	C (Public centre)	FG3	Participant11	Abet Level 4	19
			Participant12	Abet Level 4	39
			Participant13	Abet Level 4	24
			Participant14	Abet Level 4	24
			Participant15	Abet Level 4	63
North West (NW)	D (Public centre)	FG4	Participant16	Abet Level 4	42
			Participant17	Abet Level 4	19
			Participant18	Abet Level 4	18
			Participant19	Abet Level 4	22
			Participant20	Abet Level 4	41

All adult learners were learning at ABET Level 4. In South Africa, adult education is provided at ABET levels 1 to 4. Some adult learning centres offer the National Qualifications Framework (NQF) Level 4 certificate, which is the Matric/Grade 12 certificate, and these centres were used in the research. From the focus group interviews, most of the students aimed to obtain the Matric (Grade 12) certificate after completing their ABET Level 4. Many learners use their Matric (Grade 12) certificates to apply for places at tertiary institutions to further their studies. ABET Level 4 is considered equivalent to Grade 9 at a school level.

The identities of the learner participants in the focus group interviews were not disclosed, as numbers were used instead of their names. This was done in accordance with the research ethics. Other aspects of biographical data, such as race and gender did not affect the research findings.

6.1 Themes from the Focus Group Interviews

In general, teaching and learning involve both learners and their teachers. In this study we found it essential to involve adult learner participants because they would shed light on the phenomenon under investigation and answer the question: *How can mobile learning solutions be effectively implemented to expand access to education for adult learners, particularly in rural and under-resourced areas?* Moreover, their experiences were considered necessary. The participation of adult learners in the focus groups was carried out in the different ABET centres to collect data on the problem. Four focus group interviews were conducted in

two provinces of the country, and the research question was used to guide the interview process, resulting in themes. From the manual thematic data analysis, two themes emerged and are tabulated below.

Table 2: Research themes

	Themes
1	Exploring different applications to learn through the use of mobile devices
2	Access to a learning spaces

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Theme 1: Exploring different applications to learn through the use of mobile devices

Online learning has advanced more than ever due to the emergence of new designs of online tools and applications. M-learning, a subset of online learning, has gained prominence in the educational field due to the continuous emergence of mobile devices and technologies. Mobile devices, such as smartphones and tablets, are extremely common. The widespread use of smartphones is apparent, as all participants from the interview groups had owned smartphones at some point, and almost all still own them. These devices are equipped with various applications. According to Zhang and Liao (2015), applications mean some kind of technology, system, product application, or software that runs on a smartphone.

Participants in all the focus groups mentioned that they knew some applications, such as Twitter, Facebook, WhatsApp, Instagram, YouTube, TikTok, Games, Calling, and Google, were available. This confirms the statement of Criollo-C et al. (2021) that technology and social media have become part of our daily lives. All participants in the FG group were aware of these apps and used them. WhatsApp is a popular application among participants as they use it to chat, make, and receive calls. WhatsApp is an online chatter and instant messaging application that sends photos, videos, images, messages, and files (Mursidi & Murdani, 2018). Interestingly, all participants said they used Google to search for information for school projects. Participants also mentioned that their teachers have smartphones and sometimes use them to search for information while teaching them. For example, Participant 7 stated,

> *"During the Ancillary subject, our teachers use their phones to search for information for us. Other teachers use their phones to communicate with us through WhatsApp."*

Participants 8 and 9 also mentioned that when they are given school projects to do, their teachers would instruct them to go and search for information at the library or use Google from their phones.

When exploring different applications that are available on mobile phones, the disjuncture is that some participants were not aware that the applications they mentioned could be used not only for personal use but also for learning. Participants in FG3 had to be interviewed twice due to failed recording during the first round. In the second interview, the participants stated that they were unaware they were engaged in some form of mobile learning before the exposure segment. For example, they communicated with their teachers via

WhatsApp about schoolwork and watched educational videos on YouTube. They further stated that, with the exposure part of the interviews, they now know they can download school-related material using their cell phones. "*Before, it was a matter of knowing about different applications such as Twitter, Instagram, and Facebook that would only be used for communication*", said Participant 13. Knowledge and skills about these applications are necessary to use for learning purposes, as not all participants are familiar with them. For example, Participant 15 did not know what YouTube was, and Participant 4 stated that emailing is a problem and that he would like to be taught how to use email should m-learning be adopted. The statement of Participant 4 shows the need and relevance of m-learning to ensure that adult learners are kept up-to-date on the use of technologies.

Not all participants were positive about m-learning. For example, Participant 6 did not prefer m-learning and, referring to the YouTube application, said, "*With m-learning, I would fail because I would watch YouTube videos that are not school related, that would distract me.*" Since anyone can upload video content on YouTube, its content, if not verified, could be misleading (Helming et al., 2021), and the entertaining nature of YouTube poses risks that can result in reduced academic motivation (Shoufan & Mohamed, 2022). Despite this, Participant 6 knew the YouTube application and how it worked. In this way, different studies profiled how different applications can be used in the educational field. For example, van den Berg and Mudau (2022) investigated the WhatsApp groups of postgraduate students as an online communication tool to support teaching and learning during COVID-19. It is important to note, though, that the social aspect of the FRAME model denotes that rules of cooperation must be clear, in place, relevant, informative, and accurate for communication and learning to occur. There are numerous studies on how different applications can be used to learn. For example, Shoufan and Mohamed (2022) did a scoping review of YouTube and education, while Suarez-Lantaron et al. (2022) studied the educational use of WhatsApp. These studies demonstrate the use of applications in the educational field and the feasibility of m-learning for adult learners in the ABET sector. This is made more accessible because today's smartphones have different applications, and many other applications can be downloaded to support teaching and learning.

Theme 2: Access to learning spaces

Currently, adult learners in the ABET sector can only access learning in physical classrooms made of bricks and mortar. When visiting the four public ABET centres, the researchers noticed that two of the centres had their own private land. In addition, one centre used an old school building belonging to the community or government, and the other did not own private space or buildings. Participant 6 said,

> "*Here we call this place a Skills Centre. It is a rented place and does not belong to Community Learning Centre B. It is a satellite; we attend here because going to the main college is far.*"

Satellites are sub-centres of the main centre or college. They are in different areas, allowing learners who stay far from the main centre to access education.

At Centre C, adult learners used classes from a community public high school actively working with its own learners and teachers. With an agreement, small sections of this high school were given and treated as the ABET centre, operating separately from the high school. Teaching and learning in these ABET centres happen during the week, from Monday to Friday, and adult learners attend these centres in the late afternoons and evenings. "*I tell people that I go to a night school, not ABET*", said Participant 12, and Participant 1 confirmed this by saying,

> "*ABET is a night school. Remember, back in the day, these schools were called night schools. I still call our centre a night school. They called them night schools because people used to attend them late, from 6 pm to 8 pm.*"

In South Africa, adult learners typically attended night schools rather than children who went to school during the day. This means that night schools were focused on adult learning, known as andragogy, where adults would work at home or at formal jobs during the day and then voluntarily attend classes in the evenings.

Generally, adult learner participants meet with their teachers at these centres and meet face-to-face for teaching and learning sessions. As mentioned, some participants have indicated they face challenges associated with coming to the centre daily and travelling long distances. Related challenges include commuting daily, not having enough money to commute, and spending some hours at the centre, which were considered extended hours. In this regard, Participant 12 said,

> "*I have a challenge to stay here from 8 am until 2 pm and actually to come here every day, and you'd find that at times you haven't studied anything.*"

Additionally, Participant 1 said: "*Some teachers do not come and teach us, and it is boring. It is the reason why I don't want to come here every day*." Participant 13 added,

> "*My challenge is that I notice that I am an older person who will attend school, and sometimes I wonder and ask myself if it is worth it or if I am wasting my time. Maybe I should quit and go look for work, plus one salary is not enough for our household. At the same time, I realise that learning might benefit me in the future.*"

Challenges varied and were associated with specific responsibilities. Participant 16 said,

> "*I have to do my chores at home before going to school, and that is challenging. At times, my son comes here crying, looking for me or something because our house is not far from this centre.*"

Despite adult learners' above challenges, they still have to go to the contact centres to access education. The disadvantage is that adult learners in the ABET sector, with different life responsibilities, depend on face-to-face contact sessions at the ABET centres to learn. In other words, these adult learners cannot learn

'anytime, anywhere' unless they physically come to the ABET centres. As participants have stated, coming to the centres physically to access education is limiting and, to a certain extent, inconvenient for some. The four adult learners who did not prefer mobile learning still found some positive aspects of using mobile devices for learning, such as searching for information and communicating with fellow learners and their teachers. The limiting aspect of not using mobile devices contrasts with the concept of mobile learning discussed in the FRAME model, promoting teaching and learning "anytime, anywhere". The adult learners' participants show they own mobile devices and should be able to access education 'anytime, anywhere'. Despite the challenges experienced with coming to the centres, four adult learner participants expressed that they preferred a physical classroom setting instead of using a mobile device for learning. They expressed that the screen sizes of mobile devices were too small for one to learn, which has been confirmed by earlier studies (e.g. van den Berg & Mudau, 2022). Five participants referred to a blend of face-to-face and m-learning as a subset of online learning. Participant 4 said, "*M-learning needs to be supported by face-to-face learning*." The blended learning as a combination of face-to-face learning and m-learning that Participant 4 refers to has benefits. According to Shand and Farrelly (2018), blended learning allows learners to meet face-to-face, and with the online portion of blended learning, they have continuous access to online content resources, frequent communication, and grades.

Teaching and learning can never be complete without a supportive structure for learners. Participants have expressed that the resources available at their centres, such as chalkboards and books, contribute significantly to the support structure. Other than that, they have their teachers to whom they reach out when they need help. "*We don't have computers, Wi-Fi and no photocopying machine*", said Participant 8 of FG 2. Participants who were in the centres during the COVID-19 pandemic indicated that their learning was not supported during that time and that m-learning could support their learning. "*M-learning is needed; imagine if another sickness comes, we will not learn*", said Participant 13. The majority of 16 adult learner participants indicated that, should m-learning be adopted, some learning-related problems could be solved. "*With m-learning, I would have the opportunity to learn and work simultaneously*", said Participant 11. Participant 5 also added: "*With m-learning, I would be able to submit my schoolwork online while at home or at work.*" All participants agreed that it would save them time travelling daily to school. The above addresses the challenges that adult learners experience, and with m-learning, access to different learning spaces, including physical classrooms, would simplify how adult learners learn.

6. Recommendations

Based on the research findings, several recommendations can be made to enhance the use of mobile technologies to support adult learning, particularly in rural and under-resourced areas. These recommendations aim to address the challenges identified and leverage the benefits of m-learning:

Provide subsidies and incentives
The South African government and the Department of Higher Education and Training should consider providing subsidies or incentives to adult learners to purchase mobile devices. Partnerships with telecommunications companies to offer affordable Internet packages can help bridge the digital divide and expand access.

Present digital skills workshops
The management team of the ABET centres, in collaboration with the Department of Higher Education and Training, should organise workshops and training sessions to teach adults how to use mobile technologies effectively for learning. This includes basic skills such as emailing, using educational applications, and Internet navigation.

Utilize popular applications
Teachers at ABET centres should be trained to take advantage of widely used applications such as WhatsApp, YouTube, and Facebook for educational purposes. Guidelines and resources should be provided for teachers on how to use these platforms effectively for teaching and learning.

Combine face-to-face and mobile learning
An extended learning approach that combines traditional face-to-face classes with mobile learning should be considered. This approach can provide flexibility while ensuring learners receive the support they need.

Implement interactive learning platforms
The use and implementation of a mobile-friendly learning management system (LMS) that supports interactive learning should be adopted in the ABET sector. These platforms should be zero-rated (similar to universities) to allow for real-time communication, content sharing, and collaborative projects so that adult learners can gain the required 21st-century skills.

7. Conclusion

The focus of this research study was to explore the use of mobile technologies for learning for adult learners in four ABET centres in South Africa, and addressed the following research question: *How can mobile learning solutions be effectively implemented to expand access to education for adult learners, particularly in rural and under-resourced areas?* The research findings indicated that adult learners were aware of mobile technologies such as YouTube, Facebook, Twitter, Google, and WhatsApp, and some were using it on a daily basis. For this reason these technologies can be used in teaching and learning for adult learners to conveniently access education at any time and anywhere. In the twenty-first century, teaching and learning in the ABET sector can no longer be limited to the content found mostly in prescribed books, where the information found in them becomes obsolete quickly. The integration of mobile technologies in adult education presents a significant opportunity to improve learning accessibility and outcomes, particularly for those in rural and under-resourced areas. This research had some limitations, including the small number of participants and

ABET centres involved. Additionally, only learners, and not teachers, were used as participants. To address these limitations, further quantitative and qualitative research is needed to gain more diverse and comprehensive perspectives. Lastly, the recommendations put forward in this research should be considered so adult learners can benefit from flexible, engaging, and relevant educational experiences. adult learners can benefit from flexible, engaging, and relevant educational experiences.

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Appendix 1: Interview hand-out / notes

Definition of key concepts

Learning

Learning is a process of making changes in one's thinking, knowing, doing and feeling (Baatjes and Baatjes, 2008: 6). This learning process allows learners to get new knowledge and skills or even expand insights and understanding on their already acquired facts.

Face-to-face learning

Face-to-face is an instructional method where course content and learning material are taught in person to a group of people (Tophat, 2021). In a face-to-face session, learners and their facilitators get together in a live meeting at the same place thereby encouraging the sharing of knowledge (Acheampong, 2021).

Mobile learning

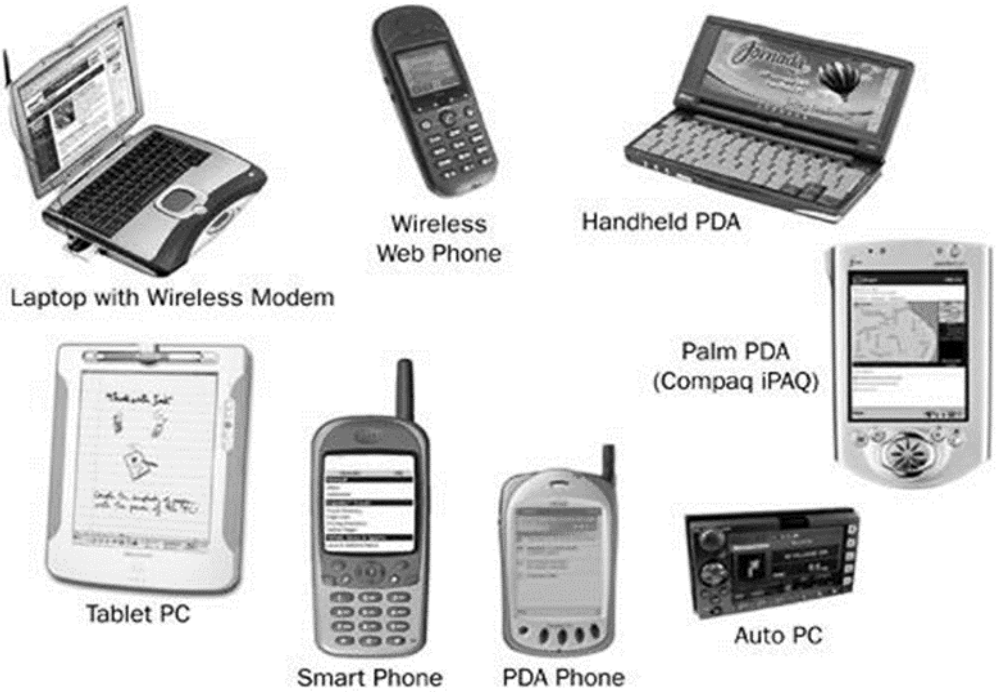
Mobile learning "is a new way to access learning content via mobile devices" (Priscila, 2020). It can also be defined as the provision of education where palmtop or handheld devices are used (Traxler, 2005: 262). Through mobile technologies, learners can access education from anywhere at anytime just because "the core characteristics of mobile learning are ubiquitous, interactive, collaborative and instant information" (Ozdamli & Cavus, 2011: 937).

Mobile devices

Mobile devices are electronic devices such as cell-phones and computers that are portable, handheld and wireless. Just like computers, mobile devices can do anything without complications relating to emails, internet access, data transmission, and so forth (Bicen & Kocakoyun, 2013: 756).

Mobile technologies

Mobile technologies include electronic devices that are portable and very much linked to the user's mobility in using them. It consists of the communication networks called wireless technologies that are typified by internet – enabled devices such as watches, tablets and smartphones (IBM, 2021).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Tablet PC
Smart Phone
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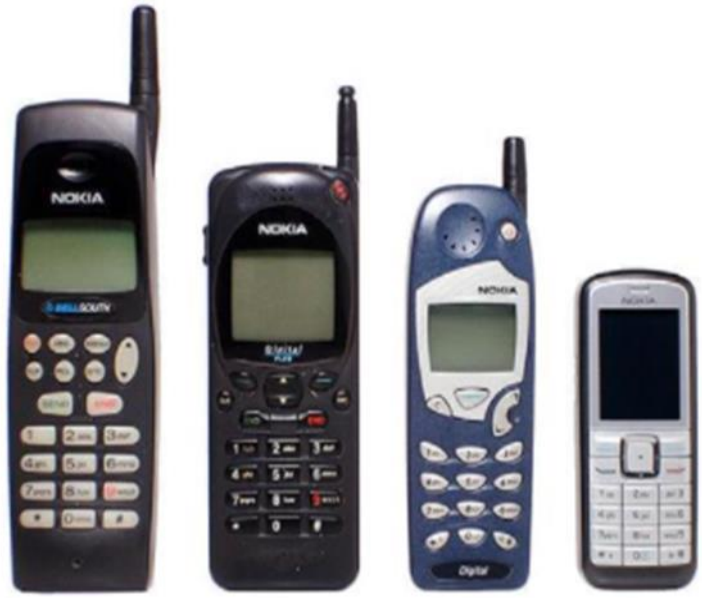
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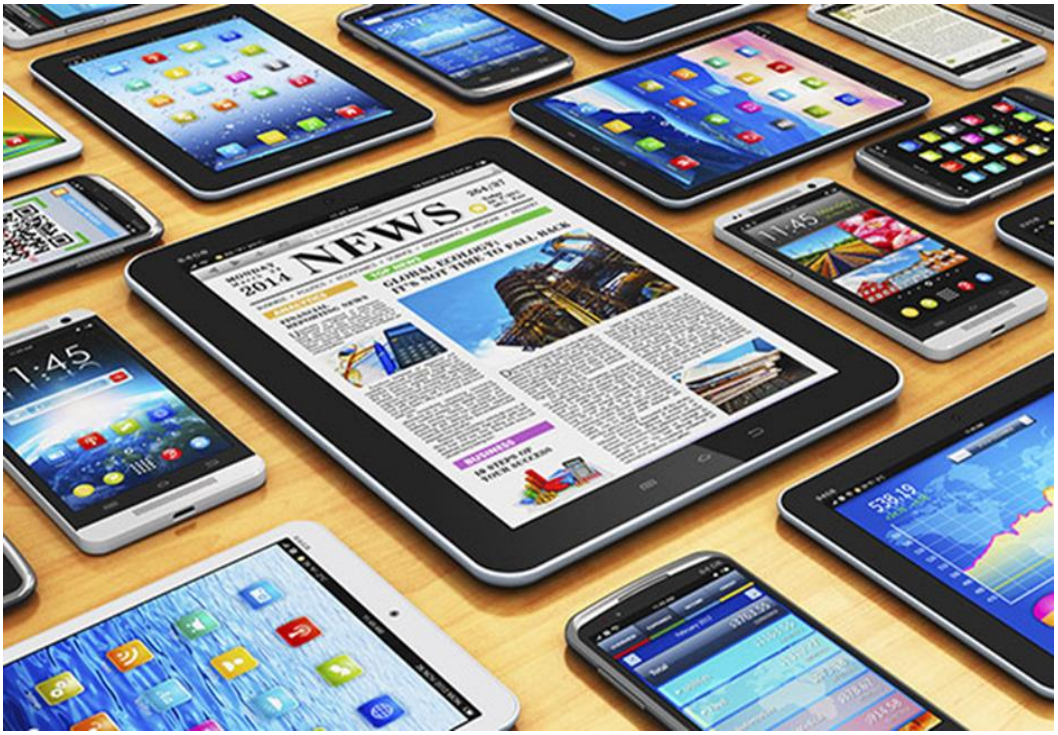
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