

THE BASICS OF A MOBILE MONEY-BASED FINANCIAL SERVICE: PERCEPTIONS OF UNIVERSITY STUDENTS IN NIGERIA

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Abstract: The purpose of this quantitative research was to investigate the basis and perception of mobile money (MM) service among Nigerian university students. The paper adopted a positivistic ontology and descriptive survey design. Two hundred and fifty students from five universities in the southeast geopolitical zone of Nigeria were sampled. Results showed that perceived ease of use (PEOU), perceived usefulness (PU), perceived credibility (PCRED), and perceived risk (PR) had significant and positive relationship with behavioral intention. Given the results, these four fundamental issues must be central to inclusive mobile money-based financial service for Nigerian university students. The adoption of the technology acceptance model (TAM) by mobile network operators (MNO) and banks is critical to ensure acceptance of innovative and inclusive mobile-based financial service and success in the university student market.

Keywords: mobile money service, university students' behavioral intention, perceived ease of use, perceived usefulness, perceived credibility, perceived risk.

JEL Classification: M300, M310.

1 Introduction

Nigeria mobile money (MM) services have remained sluggish in spite of the efforts made by financial institutions and other agencies to promote its inclusivity even among university students. In contrast, the growth of mobile telephones in Nigeria is an unexpected change in communications technology and has provided new and rapidly developing technological methods that have helped to facilitate monetary payments and transfers in under-banked and unbanked communities. Students in universities and the poor at the bottom of the pyramid are among the billions of people affected by mobile phones worldwide (Ahmed and Kabir, 2018). Today, switching over to technology creates channels beyond branch networks that help in extending banking and non-banking services to the unbanked, similar to those dispersed by branches. The high rates of mobile phone network penetration and adoption, lower service fees relative to conventional bank accounts, and lack of affordable alternatives, especially among rural communities, have resulted in rapid use of MM, especially in devel-

oping economies. Almaiah and Alismaiel (2019) asserted that this speedy development of information and communication technology (ICT) has universally affected the banking business. Some studies have shown the usefulness of MB in facilitating the financial transaction between banks and their customers (Bjornsen and Archer, 2015; Bharti, 2016). MM service is a powerful means to delivering savings service to billions of people globally who have a cell phone but do not have the chance of visiting the halls of financial institutions. It has some benefits over conventional banking methods as it breaks down geographic constraints and offers some benefits such as immediacy, security, and efficiency (Nwankwo, Kanyangale and Abugu, 2019). Two institutions, namely, the Central Bank of Nigeria and some universities in Nigeria, are leveraging technology to continue providing services while adhering to social distance requirement to avoid the spread of coronavirus (Covid-19). The Central Bank of Nigeria is urging people to reduce their use of cash and embrace the use of alternative payment channels such as mobile banking (MB), internet banking (IB), MM, and point of sale (POS) as a response to the coronavirus (Covid-19) pandemic

(CBN, 2020). On the other hand, Nigerian university students have in recent times adopted the use of mobile phones in online learning. Therefore, as the future goes digital in various ways (e.g. online purchase, online learning), university students are majorly targeted as the knowledgeable customer with some exposure to technology.

However, despite the inflow of cell phones into many developing countries in which Nigeria is not excluded, the country's economic condition has not allowed a sizable number of its inhabitants in the rural areas to have access to Internet and banking services (Nwankwo, et al., 2019). Similarly, Gupta (2013) asserted that most Africans have no access to banking services. This also aligned to the view of Demirgüç-Kunt, Leora, Dorothe and Peter (2015) that only 54% of adults in developing countries have a bank account, compared to 94% in the Organization for Economic Co-operation and Development (OECD) countries. The Central Bank of Nigeria in its study added that 65% of Nigerians lack access to credit facilities (CBN, 2019). The challenges of limited access to financial services in Nigeria stem from lack of adequate infrastructure, inaccessibility of banking service, and lack of financial education (Oluwatayo, 2012).

MM service is an essential component of the emerging electronic payment and banking industry, though this type of service is not well defined in most scholarly literature. Generally, the term mobile money includes all the various initiatives (micro-payments, long-distance remittance, and informal airtime battering schemes) which bring financial services to the unbanked using mobile technology. In other words, MM as a tool for financial inclusion is defined as the full range of services (credit, insurance, payments, and savings), with specific quality features of delivery (affordability and stability), inclusiveness (with particular focus on the poor), and choice (offer of service by a range of institutions) (Apiors and Suzuki, 2018). Mobile network operators (MNO) in most emerging economies are at various stages of Modern Monetary Theory (MMT) implementation to exploit the market for MM services. In Kenya, Safaricom's M-pesa by Sadhas been hugely successful as a result of the adoption of MM services. However, the adoption of similar MM services in the Philippines, South Africa, and Ghana has not enjoyed the same success.

These days, most people have the desire to share or send money to others. These people are willing

to exchange cash or financial assets through their mobile phones, mainly to ease stress involved in the banking operations. The Global Findex database has disclosed that 515 million adults globally opened an account at a financial institution or through a MM provider between 2014 and 2017. It implies that 69% of these adults now have an account, up from 62% in 2014 and 51% in 2011. In high-income economies, 94% of adults have an account, while in developing economies, 63% have (World Bank Group, 2018). In this case, it is evident that there is a wide variation in account ownership among individual economies. In 2020, the number of smartphone users in the world was 3.5 billion, which represents 45.04% of the world's population owning a smartphone. In total, the number of people who own a smartphone is 4.78 billion, making up 61.51% of the world's population (Turner, 2020).

The high number of mobile phone users globally and the level of Internet services raise the question of how Nigerians, especially university students, perceive the ease of use, usefulness, credibility, and risk associated with MM services. Arguably, the four essential aspects of any comprehensive MM-based financial tool for university students are easy to use, usefulness, credibility, and negligible risks if any. It is against this backdrop that the study examines students' perception of MM services in selected universities in Nigeria. In the domain of student banking services and MM services, there is a dearth of university students' views illuminating what makes the MM services acceptable to them or not.

2 Review of related literature

• Perceived ease of use

The degree to which a person believes that using a system would be free of effort is the core of perceived ease of use (PEOU) (Manoranjan, Pradhan and Snigdha, 2014). Peruta (2017) affirmed that the degree to which an innovation is easy to understand or use shows its PEOU. Erdem, Pala, Özkan and Sevim (2019) claimed that PEOU positively affects behavioral intention to use MB. People are likely to develop a positive attitude toward intention and behavior to use goods or services with less complexity in user communication. Narteh, Mahmoud and Amoh (2017) maintained that PEOU has a significant positive effect on behavioral intention to use online banking in Malaysia. Several studies have proposed that a system

that is easy to use is likely to be accepted generally than the one that is not (Peruta, 2017; Waitara, Waititu and Wanjoya, 2015). However, several findings have shown that the general causalities found in technology acceptance model (TAM) are also applicable to mobile services (Ezeh and Nwankwo, 2017).

- Perceived usefulness

Perceived usefulness (PU) is the degree to which a person believes that using a particular system would increase his/her job performance (Kazi, 2013). The importance of PU has greatly earned recognition in the area of m-banking (Lubua and Semlambo, 2017). Research explained the significant impact of PU on user acceptance of m-banking (Kikulwe, Fischer and Qaim, 2014). Kazi (2013) asserted that user acceptance of computer systems is driven to no small extent by PU. Moreover, Collins, Liyala, Odongo and Abeka (2016) hold forth the view that PU directly affects IB usage. People use online banking services because they find that using banking websites improves their banking activities and is also useful in performing financial transactions (Shaikh and Karjaluoto, 2015). Hsu, Wang, Chih and Lin (2019) found that PU affects Taiwan people's intentions to adopt e-banking systems significantly. Hence, the higher the PU of using m-banking services, the more likely users will accept it (Nwankwo and Ifejirofor, 2018). Similarly, Komulainen and Saraniemi (2019) maintained that customers will have a positive attitude toward MB when they feel that using it will benefit them.

- Perceived credibility

Perceived credibility (PCRED) refers to how a user feels the certainty and pleasant consequences of using an electronic application service when there are no risks. The variety of possible risks include financial risk, physical risk, functional risk, social risk, time loss risk, opportunity cost risk, and information risk (Kazi, 2013). Concisely, PCRED is about the belief that the promise of another can be relied upon even under unforeseen circumstances (Shaila and Al-Jabri, 2014). The acceptance and adoption of innovation or new technology are significantly affected by security concerns (Jonhson, Woolridge, Wang and Bell, 2020). For credibility, the bank must ensure an excellent reputation and give the customer confidence about its services. There are many fears in the customer's mind, but if that particular bank's credibility is high, the customer will be assured that their bank transactions are safe (Kazi, 2013). If the credibility

of the bank is low, customers perceive risks, which erodes trust and willingness to use technological innovations (Komulainen and Saraniemi, 2019)

PCRED consists of two crucial elements: privacy and security. The protection of information or systems from unauthorized intrusions is vital for security (Nwankwo, Ojieze, Ani, Obiesie and Ifejirofor, 2017). The growth and development of e-Commerce, including the adoption of electronic banking, are also impeded by fear of inadequate security (Anouze and Alamro, 2019). PCRED is the personal belief a user has in the system to carry out a transaction securely and maintain personal information privacy (Koksal, 2016). Nwankwo, et al. (2017) maintain that PCRED is a determinant of behavioral intention to use an information system. Lin, Wang and Hung (2020) found that IB users were very concerned about security. Many of them were using IB for accounts inquiry only due to problems of credibility.

- Perceived risk

Perceived risk (PR) is a significant barrier for customers of MM transactions. Concisely, PR is about a consumer's belief about the likelihood or potential of uncertain adverse outcomes from the MM transaction. Consumers' desire to minimize risk surpasses their willingness to maximize utility, and thus, their subjective risk perception strongly molds their behavior (Koksal, 2016). Therefore, reducing uncertainty has been uncovered to have a positive influence on consumers' intention to accept e-transactions (Phan, Narayan, Rahman and Hutabarat, 2019).

- Technology acceptance model

Over the decades, TAM has been tested and applied to predict the future behavioral outcome of consumers (Ezeh and Nwankwo, 2017). The model is established on the premises that the constructs, PU and PEOU, are fundamental determinants of MM adoption and use (Nwankwo, et al., 2017). Free of effort and enhanced performance establish a favorable disposition and intention toward using information technology. As indicated earlier, PU reflects the degree to which a person thinks that using a particular system will improve his/her performance, whereas PEOU is "the degree to which a person believes that using a particular system will be free of effort" (Davis, 1989, pp.11). TAM has been applauded by earlier studies on its contribution to the understanding of consumer behavior. Nwankwo, et al. (2017) further added that the model

has received extensive empirical support through validations, applications, and replications for its power to predict the use of information systems. Similarly, Legris, Ingham and Colletette (2003, pp.202) concur that “TAM has demonstrated to be a useful theoretical model in understanding and explaining user behaviour in information system implementation.”

- Innovation diffusion theory

Scholars have also turned to the explanatory power of Rogers' innovation diffusion theory (IDT) to explain consumer behavior toward new technology (Rogers, 1995). Innovation is defined as “an idea, practice or object that is perceived as new by an individual or another unit of adoption,” while diffusion is “the process by which an innovation is communicated through certain channels over time among the members of a social system” (Rogers, 1995, pp.10). Thus, innovation diffusion is primarily about how a social system accepts and adopts an idea or a technology. According to Roger (1995), there are five key characteristics of any innovation relevant to its diffusion. First, there is a Relative Advantage (RA), which is the extent to which the innovation is perceived as better than the practice it supersedes. Second, Compatibility depicts how adopting innovation is compatible with what people do. Third, Complexity is the extent to which an innovation is perceived as relatively difficult to understand and use. Fourth, Trialability focuses on the extent to which an innovation may be tried or tested on a limited scale or basis before making an adoption (or rejection) decision. Lastly, Observability is the extent to which the results of an innovation are visible to others. How each of these characteristics of innovation affects PEOU or eliminates the PR of using banking-related technology by students is critical for students' financial inclusion and penetration of the student finance market using accessible mobile technology.

- Application of TAM and IDT to MM

The different terms related to the use of mobile phone to access, store, and transfer or link to an account which operates m-banking, m-payments, m-transfer, and m-microfinance are referred to as MM in this study. Therefore, the determinants of adoption in m-banking and m-payment setting may also apply to MM. TAM and IDT are amazingly similar in some constructs and supplement one another (Nwankwo, et al., 2017). Some similarities are recognizable between RA and PU; Complexity and PEOU, to the extent that

some researchers identify the TAM constructs as a subset of IDT (Nwankwo, et al., 2017). However, developing different scales for RA and PU was uncovered to be crucial in MM adoption. Also, Complexity and PEOU are too similar to be separated in this study. With a focus on students, this paper aimed at examining the relationship between determinants of MM (PEOU, PU, PCRED, and PR) and behavioral intention to use MM services.

Based on the application of these theories, the research hypothesis was formulated:

Ho: There is no significant relationship between the determinants of MM (PEOU, PU, PCRED, and PR) and behavioral intention to use MM services.

3 Methodology

This paper used the positivistic ontology and descriptive survey design. The areas covered in the study are five selected public universities in southeast Nigeria. The universities which were randomly selected are: Chukwuemeka Odumegwu Ojukwu University, Ebonyi State University, University of Nigeria, Federal University of Technology Owerri, and Michael Okpara University of Agriculture. The five institutions were used because of proximity, and also, the researchers chose to sample one public university from each state in the zone. The study focuses on the undergraduate students at these universities. However, convenience sampling technique was employed to select the participating students, while structural questionnaire was designed as the primary instrument. Content validity was used to adequately measure the coverage of the research topic. A trial test used to estimate the internal consistency gave a value of 0.711, while the data collected were tested using the multi-regression analysis.

4 Results

Table 1 shows the correlation coefficient between determinants of MM (PEOU, PU, PCRED, and PR) and behavioral intention to use MM services ($r = 0.572$, $p < 0.05$). The correlation coefficient table shows that all MM determinants are positively and significantly correlated with the dependent variable (behavioral intention). The value of p is lower than 0.05, and the correlation coefficient is 0.572 or 57.2%. With this level of significance, the null hypothesis is rejected.

This result indicates a positive and significant relationship between MM determinants (PEOU, PU, PCRED, and PR) and behavioral intention to use MM services in Nigeria. However, the relationship between the two variables is not only significant, but also *equally strong and positive*. Having acknowledged the relationship between determinants of MM

and behavioral intention to use MM services, further tests were carried out using multiple regression analysis to ascertain the individual contribution of each determinant of MM on behavioral intention to use MM services by university students in Nigeria.

Table 1. Pearson's correlation between determinants of MM (PEOU, PU, PCRED, and PR) and behavioral intention to use MM services (*Source: IBM SPSS statistics version 25*)

		MM determinants	Behavioral intention
MM determinants	Pearson's correlation	1	572**
	Sig. (two tailed)	–	0
	n	249	249
Behavioral intention	Pearson's correlation	572**	1
	Sig. (two tailed)	0	–
	n	249	249

**Correlation is significant at the 0.01 level (two tailed).

Table 2. Exploratory factor analysis of the measurement of determinants of MM (PEOU, PU, PCRED, and PR) (*Source: IBM SPSS statistics version 25*)

Item	Mean	SD	Factor loading	Item total correlation
Mobile money determinants Factor				
PU	4.57	1.621	0.852	0.521
PEOU	4.46	0.433	0.781	0.454
PR	4.32	0.512	0.705	0.412
PCRED	4.12	1.132	0.699	0.399

KMO (Kaiser-Meyer-Olkin index) = 0.802; $\chi^2 = 718.342$; $df = 3$; $p < 0.000$; Cronbach's $\alpha = 0.711$; percentage of variance explained = 60.67%.

The exploratory factor analysis (EFA) results are presented in Table 2, which measures each of the MM service determinants' factor loading.

In this study, reliability was used to examine the level of internal consistency of the several measurements used in the research construct. The internal consistency of components, or factors, and the respective items which appeared from the EFA measurement was analyzed separately using Cronbach's alpha coefficient via IBM SPSS statistics version 25. The Cronbach's alpha coefficients were: PU (0.663),

PEOU (0.624), PR (0.698), and PCRED (0.614). A factor consisting of a *four-item measurement* of behavioral intention produced an internal consistency of 0.711. No factor was excluded in the measurement model as Cronbach's alpha coefficients' results were above 0.600 or 0.700. Based on the results of the EFA, the determinants of MM in this paper were examined via the multiple regression analysis/model measurement depicted in Table 3. The result also integrates model summary, analysis of variance (ANOVA), and coefficients in one broad table to thus obtain a clear, holistic view.

Table 3. Determinants of MM as predictors of behavioral intention
(Source: IBM SPSS statistics version 25)

	R	R ²	Adjusted R ²	F	B	T	Sig.
	0.721 ^a	0.512	0.474	21.162	---	---	0.000 ^b
PEOU					0.172	2.461	0.002
PU					0.188	3.212	0.001
PCRED					0.161	3.035	0.011
PR					0.157	2.482	0.021
(Constant)					---	2.637	0.005
^a Dependent variable: behavioral intention.							
^b Predictors: (Constant) PEOU, PU, PCRED and PR.							

As per Table 3, the regression model shows an R² of 0.512 and an adjusted R² of 0.474. This means that the model (MM determinants) predicts 47.4% of the variations of the students' behavioral intention. This is significant at $p < 0.05$, which means a significant relationship exists between the independent variables of different determinants of MM and the dependent variable, namely, behavioral intention. These results support the alternative hypothesis, which states a significant relationship exists between the MM determinants (PEOU, PU, PCRED, and PR) and behavioral intention to use MM services. Notably, the standardized β and the corresponding p-values for PEOU ($\beta = 0.172$, $p < 0.002$), PU ($\beta = 0.188$, $p < 0.001$), PCRED ($\beta = 0.161$, $p < 0.011$), and PR ($\beta = 0.157$, $p < 0.021$) show that PU made the largest contribution to the model, followed by PEOU, PCRED, and PR. With these results in mind, one can say that PEOU, PU, PCRED, and PR jointly serve as a predictor to the use of MM services by university students in Nigeria.

5 Discussion of results

As indicated earlier, this paper investigates MM services' perception among students of selected universities in southeast Nigeria. The focus is on the relationship between PEOU, PU, PCRED, and PR, and student's behavioral intention to use MM system. The study established that PEOU of MM services positively correlates with students' behavioral intention. This means that users who perceive innovation as easy to interact with find it easier to meet their needs. In other words, if the MM platform can be used by

mobile phone subscribers to accomplish different financial transfers and payments, such a system will be accepted. More so, if university students as users find the system as easy to use, they will find it useful. Conversely, when university students perceive mobile-based financial services as difficult to use, they will likely have difficulty recognizing the importance of the technology-enhanced service. This is in line with Isiyaku, Ayub and Abdul Kadir's (2018) findings which assert that "ease of use is an antecedent of useful." All other factors being constant, the easier a technology is to use, the less effort needed to operate it and the more effort one can allocate to other activities. This result is also in agreement with a previous report by Nwankwo, et al. (2017) which showed that there is a positive effect of PEOU on behavioral intention. This indicates that if university students find that the MM system is easy to use, they will find the system vital in meeting their financial needs.

There was a significant positive relationship between PU and behavioral intention to use MM services by university students in Nigeria. The behavioral intention was significantly determined by PU. PEOU showed a direct relationship with PU, and both determine the students' behavior toward use, which leads to behavioral intention to use, and also, actual use of MM-based financial services by these students. This means that students' intentions to use MM services will increase if they find the system easy to use and useful. PEOU and clear interaction between a student as a user and the MM service promotes interest and consequently leads to the student's intention to use the service. In this way, the effects of PU ex-

plain the variance in behavioral intention. This confirms the original assertion of the TAM relationship between PU and intention to adopt a new technology. Oruc and Tatar (2017) assert that PU is a consistent and prominent factor in explaining and predicting consumer behavior in various adoption models. For university students, the degree to which they believe that using mobile-based financial services enhances their performance and improves the benefits of financial services is key. The findings conform with other studies where TAM has been tested and a direct interrelationship between PU and behavioral intention to use technology has been revealed (Lin, et al., 2020).

This study also found a strong positive significant relationship between PCRED and behavioral intention of university students to use MM services. The perception of MM is highly influenced by the positive behavioral intentions of users toward it. This result concurs with the finding of Nwankwo, et al. (2017) that there is a strong link between intention and actual behavior as well as credibility and intention to use technology. Behavioral intention to use is a function of attitudes from the PCRED of the product. Thus, it is a measure of the strength of one's willingness to exert effort while performing certain behaviors (Lin, et al., 2020). However, a study carried out by Nwankwo, et al. (2017) argued that behavioral intention does not perfectly correlate with actual behavior, implying that an individual may be engaged in a less-intended choice due to the presence of some constraints (behavioral control factors like privacy, security, etc.). It is noteworthy that MM adopters who find the services very useful and credible are likely to discontinue using them when their usefulness and credibility ceases.

Finally, the study found that the PR of MM services had a positive relationship with university students' behavioral intention. It is clear from the study that university students strongly agree that the inherent risks involved in using a MM system determine which one they opt for. The findings follow similar observations where more than 90% of clients who use electronic payments consider the risks (security, privacy, and safety) involved as one of the many factors that influence consumers' intention (Nwankwo, et al., 2017).

6 Conclusion

The study aimed at establishing the relationship between PEOU and PU of MM transfer system, as well as between PEOU, PU, and behavioral intention to use the service and between behavioral intention to use and acceptance of MM system. Inferential statistical data analysis provides evidence of existing relationships among these variables. The conclusions derived from the study are that there exists a strong direct and positive relationship between PEOU and PU of MM service.

Similarly, there exists a strong direct relationship between PU and acceptance of MM services by the selected university students in Nigeria. PEOU, PU, and behavioral intention to use are the significant variables in TAM (Davis, Bagozzi and Warshaw, 1989). This model has consistently indicated the above relationships even when tested in different environments (e.g. banking, health, engineering, and others). This study conducted on a new telecommunication innovation and in a developing country has further confirmed the model's universal applicability and validity. The behavioral intention was proposed to have a significant influence on university students' acceptance decision of MM service. The evidence revealed by this study and previous studies has implications for MM-based financial service developers and service marketers, especially at the level of system planning, development, and implementation, and service marketing, to entrench the basics of any innovative and inclusive MM-based financial tool to serve university student market.

This study concludes that PEOU, PU, PCRED, and PR depict the basic ontological foundation of an inclusive MM-based financial tool from the user point of view of university students. This study's contribution to technology acceptance research and the basics of an inclusive MM-based financial tool is twofold. First, the study extends the literature by applying the TAM in a contemporary MM service in a developing country, which is different from the systems examined in prior studies (e.g. Legris, Ingham and Collette, 2003). With a focus on university students and MM services, the current study responds to the call to extend TAM to different contexts and enhance its generalizability to be validated (Yoon and Cho, 2016; Almaiah, Jalil and Man, 2016). Second, behavioral intention to use MM service as a mediating variable was

the most significant element in determining MM acceptance and usage among university students. Given the findings and conclusions of the study, the following recommendations are made:

- 1) Mobile financial service practitioners, whom previous TAM studies might have guided to underestimate the importance of PEOU, should reconsider the extent to which PEOU affects behavioral intention to use mobile-based financial services, especially among university students in Nigeria. PEOU is essential and does influence intended use, but its effects are task dependent. Consequently, when advertising, marketing, or implementing new systems, MM service providers should introduce approaches that will make the prospective or potential users understand the technicalities of using the mobile system to get financial services.
- 2) System designers and developers or product development team should endeavor to achieve user-friendliness in terms of both technological and financial service dimensions of MM to increase the end-users' PEOU of the system. This is because PEOU influences the users' perceptions of the usefulness, which are the basics of an inclusive MM-based financial tool. If users find both the technical and financial aspects of the service easy to use, it is perceived as useful. Hence, PEOU is a primary motivator to the PU of technological innovations. Thus, both are motivators for system acceptance or usage by university students in Nigeria.
- 3) MNO and banks should adopt TAM when planning and implementing new technological and innovative mobile financial services because this will guide them on the ontological necessity of PEOU, PU, PCRED, and PR to ensure that users find the technology and innovation acceptable. The four identified aspects constitute MM-based financial service ontology, which only ensures competitive parity rather than offering any competitive or distinctive advantage.

There are two critical implications of this study on practice and research. First, the findings are insightful to business strategy practitioners focusing on the MM services for the university student market. In this market, success is not achievable if the four essential elements of an inclusive MM-based financial tool are undermined or ignored. Researchers are implored

to repeat this study in geographic contexts and compare their findings with those in this study. Second, the current study adopted a cross-sectional design, which may not fully capture the variations in university students' perception over time. Future researchers are implored to use TAM in a longitudinal design to capture changes in the attitudes of university students on the four essential elements of an inclusive MM-based financial tool highlighted in this study.

7 References

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