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Teachers and Learners Pedagogical Novelty of Learning: The Noah's Case Study of Mobile Technology

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***Abstract*—** *In today's learning and knowledge acquisition is a walking encyclopedia, which the technology of MLearning is developing in the webpage-based for both teachers and learners in novel pedagogy. Noah's case study of mobile learning technology is a vital socio-cultural and economic development in the current dispensation. The aim of this study is integrating the collaborative initiatives, which allows behaviors of the school environment to enhance knowledge through mobile devices. The DVD multifunctional to the significance of all subjects in the primary and secondary education. The study amalgamated the theory of TPB with Noah's case study of mobile technology argument the relationship in academic learning environment. An online questionnaire with the sample size of 255, with female 164 (64.3%) and male 91 (35.7%) and combined analysis of SPSS with SEM-PLS v.3.0. The results show that TPB is consistent with Noah's mobile technology. All the latent variables and observed variables gave positive loading along with the path coefficient of the study. The relations postulated positive hypotheses in the study. The opportunity opined to knowledge transfer via MLearning novelty to the educational pedagogy in the exploit of multifuctionlity of a case. Conclusively, the TPB initially satisfied the intention of teachers and learners in the use of MLearning in the school environment coupled with the case study of Noah that seeks to complement primary and secondary coursework as portable hand-held device for everywhere learning. The innovation of MLearning technology is enhancing the effectiveness of reading among the youth who distance themselves from books to reshape the learning to the smartphone in raising the standard of education in the developing countries.*

***Keywords*—** *Teachers and Learners, Education Pedagogy, Learning Novelty, Noah's Study, Mobile Technology.*

I. INTRODUCTION

In the current cloud learning age of technology innovation, the situation has left many teachers and students with mobility of encyclopedia MLearning tool postulated in a resource tailored towards Information and Communication Technology for Development (ICT4D) [1]. The novelty of mobile learning technology innovation has personalized the methodology of instructors to engage learners with MLearning trends reshaping the educational setting [2]. The context at which MLearning innovation conveniences and flexibility revolving the behavior motivating students acknowledge acquisition and desirable learning outcome [3]. The dimension of related behaviors and attitudes of experience exhibited by learners are due to the addiction to mobile device, in recent times, the phenomenon researchable to education literature [4]. The demeanor of high school and college students in their quest for information via MLearning is facilitating ground educationist and stakeholders a concern, almost every student own a mobile device, according to the statistics of the UNESCO report [5]. The confrontation of the critical role the MLearning innovation is bearing in education, based on theories and literature, is a concern for policymakers and stakeholders in an effective and efficient transformation of the pedagogy of learning in schools and colleges [6]. The extent to which mobile device has eaten deep to the fabrics of teachers and learners is redefining the informal setting of MLearning, only the experience and experts have realized this can complement ICT and E-learning in schools [7]. What kind of methodology is the MLearning bringing to the frontiers of education in the era of technology innovation?

II. RELATED WORK MLEARNING

In the digital age of MLearning technology, learners' find the device useful and easy to use in the enabling environment of the informal setting [8]. This often realized in the exercises and assignment executed by students, and the hypertext information aids content explanation of feedback, mobile device an instant instructor to learners [9]. The approach of current students are observed moving with mobile devices more often than their books, the portable hand-held device allow for learning any place at any time [10]. Setting the tone is from the reign of teachers, who have demonstrated in the school environment the importance of MLearning novelty. The teacher-learner conduct of pursuing the MLearning is cognizance with the theory of building cognitive domain and widening learning horizon in the educational transformation [11]. Due to misconceptions about the socio-cultural ethics of MLearning, many perceptions are affecting the technology. The teacher-learner involvement and integration of MLearning for society to witness the benefit of the technology innovation to enhance learners performance to meet the environment and cultural understanding [12]. The old trends in the teaching and learning with stereotype contents, MLearning varieties have resolved the one-way instructional teacher centered to learner-centered. The concept of self-learning viability is masterpiece of MLearning outside the school environment. MLearning experienced by many countries with advanced learning and resolutions of some bottlenecks in the educational front [13].

Moreover, the concepts of MLearning in the informal setting has confirmed for its instant feedback and decision making during discussions on subjects STEM that looks

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splendid for the educational paradigm. Outside the school environment no one takes responsibility and safety decisions for the ultimate usefulness of MLearning however, learners unnoticeably do get a lot of knowledge and information from the device [14]. The schools and colleges have not openly groomed their environment enough to integrate MLearning; however, learners are sneaking the devices into the school setting, for that matter, appropriate measures and regulations innovatively adapt the facility for a productive outcome. According to UNESCO report 2013, the intimidations and threats by authorities on the use of mobile devices in the school environment, will cause more harm than good, the current system of educational pedagogy is taken a paradigm shift from the old methods, due to technology advancement [5]. The formal system abhors the device, but the novelty outstanding among learners in the motivation and efficiency personalized application of study [15]. The phenomenon of MLearning is highly applauded by teachers and learners even though there is no policy in many developing countries [16]. The situation is psychologically intimated and motivated for many users of the MLearning technology [17]. MLearning most often engages teachers and learners in liberty and freedom individual learner research without any instructor. Besides, the self-leaner usefulness is effective and efficient to encourage students to learn on their own.

The essence of MLearning technology is contributing the existing tacit instructor, which learners are engaged outside the classroom, to enhance their learning acquisition of knowledge in small interface of reading, review and remember (R^3) a vibrant endeavor towards self-learning [18]. MLearning complementing the distance education system has aided in affordable E-learning context [19]. A literature admonished the MLearning concepts as the subset of E-learning, existed in the developed part of the globe for far too long, so, therefore, the adoption of the technology in high schools curriculum are didactic [20]. The study on MLearning technology innovation is appropriate grounds of streamlining the assessment for potential enabler for teacher-learner instant feedback in the learning environment. The new pedagogy of learning using MLearning comes with rules and regulations in the school environment which is capable of assessment, distribution of assignment, evaluations, and documentation [21]. Teachers and learners exploit the MLearning hammered at the right time in the technology of advanced learning with different bearing concepts. This study exames and investigate the extent to which the new pedagogy of MLearning can affect the school environment based on learners experience with the technology. How does the experience of teachers and learners in use of smartphones positively affect learning in the environment?

In the argument of Noah's case mobile learning technology development, emerged from 2007 in China in collaboration with the Beijing Normal University that offers useful learning experience across multimedia coursework. The technology of the course hand-held device included; 30,000 coursework and 8, 000 animations, language dictionaries and calculators for many languages globally. The technique of Noah's invention complemented textbooks in China and subjects cut across; Physics, Chemistry, Mathematics, Geography, Biology, Political Science, Chinese, English for both primary and secondary level educational pedagogy [22]. The inception of this technology in China improved the academic performance of many, that help to sustain others in schools [15]. Among the roles and functions of Noah's MLearning activities in schools are; students schedule calendar, name card, class schedule, memos, appointment management, and attendance of teachers' records, assignment monitors and feedback. Other functionalities; NP-iTECH, Questions and Search Functions, Graphics Calculator Technology. The digital learning device also supported the E-Books, My Blog and RPG games, as well as downloading other learnable materials. The opportunity and approaches offered by the MLearning technology in China is vast and proclaimed by experts to include in rural education areas, due to the lack of experienced teachers. The practices of Noah's pedagogy in trend of educational methodology in China has enabled students to be entertained in schools.

A. Theory of Planned Behavior

The method of planned behavior (TPB) has revolutionized information and communication in the past and present, is gotten from the theory of reasoned action (TRA) (Ajzen, 1987). The current study will not be utilizing the approach on information system rather on the behavior of teachers and learners perceived attitudes schools and colleges. Psychologically, the core constructs of TPB couple with a case study of Noah will predict the efficacy in the dispensation of new pedagogy of the school environment. The study core constructs are; Attitude (ATT), Subjective Norms (SN), Perceived Behavior Control (PBC) and Behavior Intention (BI). The expanded variables are Enabling Environment (EE) and Experience (E). The theory of planned behavior is an inception of what a learner is intended to involve or engaged in over a certain period, and the dimension entangles the persona due to the intention at separate times [24]. *Behavior Intention* (BI): the primary dependent variable (DV), that deduced intuitive actions of learners and teachers, is the sense of motivation or mindset to engage in combat [25]. The core independent variables (IV) of behavior intention are; *Attitude* (ATT) is the degree to which a student shows his or her positive or negative tendencies or feelings in using MLearning tool in school environment. Student predictive academic performance due to the novel of MLearning usefulness [25]. *Subjective Norms* (SNs) is the degree to which teachers, authorities, and society perceived that MLearning would enhance practical academic expediency of students in the educational field [25]. *Perceived Behavior Control* (PBC) the experiences and easy use of the mobile device by students in the informal environment, reposes more confidence in the behavior of MLearning in schools (Ajzen, 1985; Hartwick and Barki, 1994; Lee and Kozar, 2005).

The expanded constructs in the study of teachers and learners use MLearning as a novelty of pedagogy vital to the era of the digital learning environment. *Enabling Environment* (EE) is the physical and social environment that make up the school setting for the acquisition of knowledge in an atmosphere of convenience [26]. The environment within

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which learner is intertwined and interact with any device that facilitates learning is inclusive in this context. *Experience* (E) the possessive skills and abilities the learner has in manipulating the mobile device for easy access to information and other outcomes [27]. The teachers and learners playful motives on the portable hand-held device unconsciously lead to learning outcome. The students sneak in use of MLearning device is influence to adoption of the technology to integrate practices with theories of innovation. The variable experience will moderate on ATT construct and its dependent variable (BI). Invariably to predict the MLearning accessibility to either pull positive effect on the theory of planned behavior [28] and justification of Noah's case reform.

III. NOAH'S CASE STUDY TECHNOLOGY

The inception of Noah's mobile learning technology methodology of Chinese education is decade past, "Noah's Solution for Mobile Learning." The phenomenon keenly observed with much zeal from experts and parents. MLearning is trusted to complement the educational outcomes in many forms even though many are yet to comprehend the technology diffusion into the educational field. Societies and cultures have frowned on the manner in which the primary and secondary school children are so addicted to their mobile phones. Therefore, the investigations, experimentations, testing, and evaluations of Noah's MLearning is calming the scenario to resolving the pedagogy of learning as you go. The facility of DVDs from Noah has provided many schools and colleges on training and software multimedia educational materials for learning in the school environment. The conceptualization of the digital learning devices-DLDs was a longstanding initiative for higher level acceptance of MLearning into the school environment [29].

Fig. 1. Noah's mobile technology interface.
Source: Noah's Educational Mobile Learning Center in China

From figure 1 the appearance of Noah's mobile technology shows both Chinese and English language, it also shows different subjects areas like; history, word sheet, questions and answers, dictionary and entertainment. The facial appearance of Noah's MLearning functionality deductively changing methodology of teaching in Chinese primary and secondary education. Teachers and students in many forms lauded the technology due to motivation, concentration, entertaining, and portability of the device. The device of Noah disconnected from the technology of calls, messages, and entertainment, purposely for institutional mechanisms. More significantly is the building memory large enough for big data and files in education, such as encyclopedia, dictionaries, and books of different subjects in the primary and secondary levels. The case study of Noah is significantly influencing the lack of professionals' teachers in the rural area of education in China. This highly facilitated to sustain most of the school dropouts among the rural folks especially the girl-child. The study has also changed the pedagogy of teaching and learning in the formal and informal setting of education. The effectiveness of technology is capable of resolving the infrastructural problems of education in the area of ICT and E-learning in most developing countries.

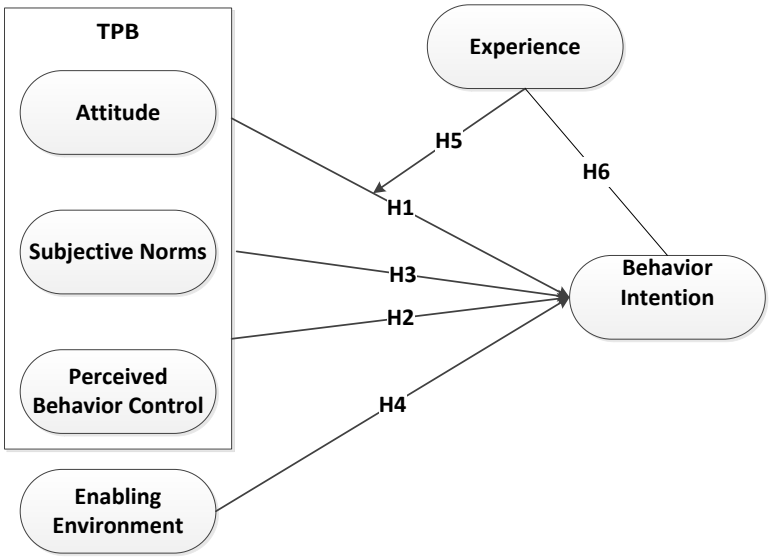

Fig. 2. Conceptual model.

A. Developing the Hypotheses of the Study

H1 attitude (ATT) has a positive effect on behavior intention (BI).
H2 subjective norm (SNs) has a positive influence on behavior intention (BI) in the schools and colleges.
H3 perceived behavior control (PBC) has a positive effect on behavior intention (BI) in the use of technology.
H4 enabling environment (EE) positively or negatively influence behavior intention (BI) in school for MLearning.
H5 experience moderates ATT in the relationship to behavior intention in the use of MLearning in schools and colleges.
H6 experience moderates on behavior intention to use technology.

IV. METHODOLOGY AND MATERIALS OF THE STUDY

The research study incorporated a mixed method for specific data analysis and satisfaction of the adapted TPB constructs. The study sample anticipated 300 size, however, due to the online web-based electronic questionnaires, most of the questions takes more times for responses feedback. The constructs are measuring the behavior changes of teachers and

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students in the school setting. This study, therefore, used five scores Likert scale from the strongly disagreed (SD) and strongly agreed (SA) [30]. The target participants in the study are teachers, students, and educationist; therefore, the study used stratified technique. The population sample size is within the general expectation of the author. The generated electronic link sent to students, teachers, and friends within the education sector via WeChat, Facebook, and WhatsApp (01/01/2018-02/04/2018). The WeChat link had more responses than others due to author presence in Mainland China. The response rate stood at 85% with 255 respondents. The researcher interaction with some selected ICT teachers on their views of mobile learning technology, gave detailed account of how learners use the facility in the school environment. 136 female represented 53.3% and male 119 represented 46.6% for the demographic variables in the study. The age, gender, education level and time in the use of mobile phones. This comparatively gave the averages of the variables on its relationship to the theory of the study.

A. Questionnaire Response Analysis

The questions examined and carefully constructed in measuring the behavior of students and teachers in the formal and informal sector education to the technology of MLearning. The first four questions built on control variables; age, gender, education level, time in use of mobile device, and length of time in use of mobile device (daily, weekly, monthly, yearly). The second part used the TPB constructs (ATT, SN, and PBC) and the expanded variables (EE and E). The measurement ranges from strongly disagree (SD), disagree (D), undecided (UN), agree (A) and strongly agree (SA) under the 5-point Likert score techniques in the study of MLearning usefulness in the school [31]. The 255 responses gotten all combined social media used 85% of the inner confidence of the study. The few ICT teachers who emailed me personally accepted the secrecy of students' use of smartphones in the school environment, which is an effective factor to learning than entertainment.

B. Measurement and Structural Model

The study intuitively measured and evaluated all variables in the study with the structural equation model and partial least square method SEM-PLS [32] only SPSS v.23 used for the control variables [33]. The study of the research took into account the validity and reliability, composite reliability (CR), convergent validity and discriminant validity [34]. The CR indexing values range 0 to 1 and from 0.7 to 0.9 for the accepted satisfactory outcome for convergent validity and average variance extract (AVE) respectively [35]. The observed variables loadings which are ≥ 0.7 was reliable to the study expectations and in conformity with similar affiliated constructs [32]. The AVE of ≥ 0.5 is the correct index by Fornell & Larker, 1981. The Cronbach's Alpha (α) that measures the internal consistency reliability of each construct should be higher than 0.7 and the latent variables distinctive features measured by the discriminant validity in the study [32].

In the principal to determining model structure, the R^2, f^2 and the path coefficient used for the analysis of outcome [32]. The indexing ranges of $R^{2;}$ 0.19 to 0.33 is a weak determiner, 0.33 to 0.67 is a moderate determiner, and ≥ 0.67 is higher determiner for the explanatory power of the variables. In the same analysis threshold of f^2 at 0.2 weak, 0.15 is reasonable, and 0.35 is strongest [32]. Similarly, the collinearity explained with the variance inflation factor (VIF) done executed to take care of biases in the study of the path coefficient.

C. Results of the Data Analysis

The descriptions of the control variables were analyzed with IBM-SPSS to strike out the variables effects on female use of the mobile device against male and at what ages engaged and the length of times as well as the frequency in use of the technology in the school setting. The overall reliability and validity measured per the principles of the Cronbach's Alpha fixed index of 0.7 for all social sciences which is 0.780 [36]. From table 1 the mean, median, standard deviation examined from the SPSS is compared study of the control variables averages.

Many 255 responses retrieved from participants, which is a rate of 85% boosting the internal confidence of the study. 5 ICT teacher and three professionals from the Ghana Education Service (GES), emailed the author to justifying their steadfast support and some students attitudes in the school environment concerning the use of mobile device on MLearning changing the face of cognitive dimension. The most useful social media in Mainland China and Ghana; WeChat, WhatsApp and Facebook spread out the questionnaire links. Teachers in response took time to express their views, on how students use MLearning for notes takes via pictures; others use it to explain topics in varied ideas and from different sources. The percentage of the female is 64.3%, and the male is 35.7%, the highest age response was 18-25 years' old (N=178, 84.6%). The highest value obtained in education is (N=195, 95.0%) which conforms with the African Tracking Survey that 72% of the youthful population is Ghana are mobile phone users (Ghana Statistical Service & Ghana Demographic Health Survey, 2008). Majority of the participants happens to be high school, college, and universities students. Likely, the UNESCO survey of identifying female as most users of technology is consonance to the outcome of the control study of male to a female percentage in this research. The regional statistics of the schools indicated Ghana's capital Accra followed by the Northern Region, Volta, and Ashanti due to the bearing the researcher took. From table 1 all the participants showed more length of time in the use of mobile device for either entertainment or communication purposes. All things been equal the participants all were users of mobile phones as far as this research study is concern.

A. Model Measurement

In the observed values of the Cronbach's Alpha (α) using the IBM-SPSS is found that their indexes are; 0.871, 0.827, 0.840, 0.813, 0.887 and 0.866 for the constructs of (BI, ATT, SN, PBC, EE, and E) respectively. The internal reliability of the latent variables that seeks to satisfy statistics of the

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research as the social sciences are a concern. The composite reliability (CR) of the path analysis also indicated SN (0.78) is lowest whiles the others are; 0.828, 0.813, 0.885, 0.847, and 0.804 for the following; (BI, ATT, E, EE, and PBC) respectively, which is acceptable in the principle of indexing statistics [32]. All mentioned values are in table 2, which indicated the strong explanatory effect of the statistical results. The lowest amount of the average variance extract is (EE) is 0.489 just slightly below the expected value, all other latent variables are satisfactory [38].

From table 2 the power of expressing value of experience (E) is $R^2 = 0.326$, and behavior intention (BI) is $R^2 = 0.157$. These are moderately assessing the power of the various latent variables affecting their correlations and outcomes [39].

From table 3 and figure, all the tested hypotheses conducted have satisfied the entire results of the study of teachers and students intention of MLearning as a novelty of pedagogy in education. The core constructs of TPB to the relationship of the moderator shows a path coefficient in significance to the study in figure 3. The H1 in the study assumed a positive attitude to behavior intention as in ($\beta = 0.142$, $f^2 = 0.025$, $t = 0.202$ and $p > 0.040$) from the inference it has satisfied the hypothesized confirming the study expectation.

TABLE 1. Demographic variables analyze with SPSS.

Variables	N				Mean	Median	Mode	SD
		%		TOTAL				
Sex	F	164	64.3	255	1.36	1.00	1	0.480
	M	91	35.7					
Education	SHS 1	63	30.6	255	1.98	2.00	2	0.827
SHS/TRS	SHS 2	95	45.9	255				
	SHS 3	37	18.8					
	TRNS	12	4.7					
Age	18-25yrs	218	85.5	255	1.22	1.00	1	0.539
	26-34yrs	23	9.0					
	35-45yrs	14	5.5					
Regions	GRA	23	9.0	255	6.14	7.00	8	2.695
	ASH	8	3.1					
	BAH	10	3.9					
	WR	28	11.0					
	ER	15	5.9					
	VR	33	12.9					
	CR	36	14.9					
	NR	61	23.9					
	UW	25	9.8					
	UE	16	6.3					
Length	1-2yrs	2	0.8	255	3.99	4.00	4	0.88
	Two n more	203	99.2					
Frequency	Yes	255	100	255	1.00	1.00	1	0.000
	No	-	-					

TABLE 2. Discriminant Validity and Composite Validity of latent variables.

LV	Fornell-Larcker Criterion							
	BI	**ATT**	**E**	**EE**	**PBC**	**SN**	**CR**	**R^2**
BI	**0.747**						0.742	
ATT	0.14	**0.702**					0.778	1.084
E	0.283	0.042	**0.731**				0.751	0.326
EE	-0.142	-0.232	0.132	**0.751**			0.751	1.082
PBC	0.189	0.075	0.151	0.015	**0.717**		0.800	0.051
SN	0.149	-0.048	0.275	0.23	0.241	**0.760**	0.526	1.271

Note: CR= composite reliability, R^2= path coefficient, BI= behavior control, ATT= Attitude, E= experience, EE= enabling environment, PBC= perceived behavior control, SN= subjective norms LV= latent variables.

TABLE 3. Significant testing results of hypotheses and structural model path coefficients.

Hypotheses	Variables	Sign	f^2	β	p	Inference
H1	ATT - > BI	0.202*	0.025	0.145	0.040	**supported**
H2	SN - > BI	1.099**	0.108	0.083	0.272	**supported**
H3	PBC - > BI	0.865	0.016	0.12	0.387	**unsupported**
H4	EE - > BI	1.423**	0.035	-0.173	0.155	**supported**
H5	E - > BI	3.065**	0.082	0.269	0.245	**supported**
H6	E - > ATT	1.322***	0.122	0.001	0.253	**supported**

Note: H=Hypothesis, M=means, SD= Standard deviation, t=t value, p=p value, f^2=effects size, *t value sign is at $p < 0.05$, **t value is at $p < 0.01$ and ***t value is at sign of $p<0.001$.

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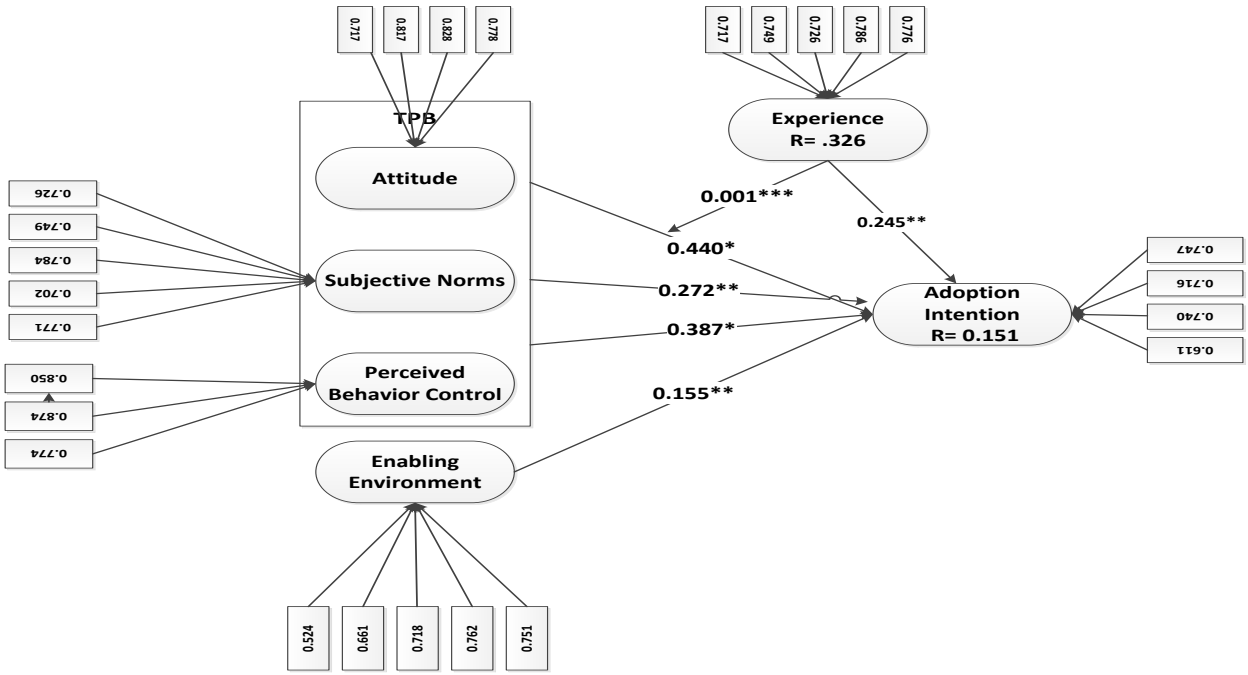

Fig. 3. Loadings indicating the latent variables and observed variables.

Therefore, the behavior of teachers and learners can influence the use of MLearning in the schools and colleges for methods of enhancing the learning pedagogy. The H2 of subjective norms to behavior intention, the tested results show positive relation due to ($\beta = 0.083$, $f^2 = 0.108$, $t = 1.099$ and $p > 0.272$), confirming the notions of others in the use of MLearning to facilitate the educational outcome [40]. The third H3 from the study, perceived behavior control to the intention equally shows ineligible effect from the table 3; ($\beta = 0.120$, $f^2 = 0.016$, $t = 0.865$, and $p > 0.387$), the behavior towards technology is insignificant influencing the adoption of such technology. H4 is the expanded variable of enabling environment on behavior intention with the results of ($\beta = -0.173$, $f^2 = 0.035$, $t = 1.423$ and $p > 0.155$) indicating that, the school environment is conducive enough for MLearning usefulness with consequences [40]. H5 and H6 are moderating effect of the dependent variable with significant relationship in BI ($\beta = 0.269$, $f^2 = 0.082$, $t = 3.065$, and $p > 0.245$) [40]. The moderator signifies the skills and ability of students and teachers in the self-use of MLearning for activities related to learning. The use of Google sites for answering questions outside the classroom motivated by the experience in use of the mobile device[41].

The inadequacy policy routine and responsible dimensions roles these experience blended with old instructional methods of teaching and learning to ensure novelty is a concern for authorities and policymakers in the developing countries. The use of the theory for technology is consistent with green space analysis in Phenom Penh, and the core constructs justifying the capability of the theory frame according to Yen Yat et al. 2017. A study conducted by Baek Zhan & Yun, 2017 also deduced that the attitudes of Korean teachers are significantly influencing the intention of educational pedagogy in the technology of MLearning in schools and colleges for academic performance. The application of mobile technology as a catalyst for teachers in the course of delivering lessons influences students to engage in using the technology for learning rather than social media chats. The MLearning enrolled on easy and quick access to topical issues in the classroom and the school environment [42].

The study has psychologically nexus TPB model to diffuse the impact of the school setting, the attitudes and conduct of teachers and learners are enough proof for policy implementation to recoiled, the technology innovatively.

V. Discussions and Recommendations

The research found the attitudes of teachers and learners affecting the intention because the technology of MLearning has generated most teacher-teachers chatrooms; where coursework discussed among them. These teachers are from different schools and colleges, and the interaction done on social media such as WeChat and WhatsApp platforms. The same scenarios replicated from teachers-learners, learners-learners chatrooms. The novelty of learning using the mobile device in a natural outcome for useful academic work. Some students have strategically formed study groups through MLearning with three or more, with a fixed period for discussions online, topics in the platform. This innovation is conceptually consistent with Noah's technology of mobile learning in China [22]. The motivation and interest of the technology have flexibly made teachers to share their mobile phone contacts with students for discussions that bothers academics. The teaching and learning methodology has moved beyond face-to-face and tentatively going innovative through the novelty of the educational pedagogy of MLearning via social media interactions [43]. The intention of adopting the

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MLearning for the new dimension is also due to the addiction on the millennial child, and some sneak in use of the medium, therefore, the study encourages the use of MLearning to improve the academic lives of the 21st-century learner in schools and colleges [44]. The constructs used in the model of the studies have satisfied by the hypotheses and significance the study cycle. Therefore, the kind of frontiers helping the education is the novel MLearning pedagogy in schools and colleges.

In the effect of the experience as a moderating variable on the behavior, intention satisfied the outcome due to teachers and learners every day and frequency of mobile device. MLearning use in any enabling environment could distract rather than concentrate on the information intended. The ability of learners to keep notes and videos of science lessons like Physics, Biology, and Chemistry could keep their cognitive domain reviewing at any point in time. The capabilities of learners use of mobile devices for other functionalities such as adobe-reader, files, books advantages the ICT and E-learning programmes in the school. A study survey by African Tracking Internet Progress found that teachers and learners, desires towards MLearning are encouraging for innovation in education. About 1.5million high school and college students owned mobile device thus 72% for downloading learnable materials and dictionary use. The research was consistent with the UNESCO encouraging developing countries to adopt MLearning for socio-economic development. The method of mobile money transactions via MLearning is representing the cashless system of developing any infant economy[45].

The case study of Noah mobile learning initially meant for primary and secondary education pedagogy. The limited scope of the discussion is for secondary and colleges of learning for developing countries. The digital learning devices (DLDs) of the mobile technology by Noah is not free item but personal device. The study found that parents purchase the tools, educational institutions, due to the content organized from experienced teachers and experts in the educational field according to establishment of "Noah's Foundation" in China, the ‘Alliance Teachers' network made of 250 experienced teachers, 17 educational experts, and more than 100 universities, colleges, and schools from provinces in China. The technology has recognized and gained international copyright agreement from many publishing houses like; Longman Published, Oxford University Published, People’s and Education Press, and Translation Publishing Houses and more.

The study recommends the following for MLearning technology as new pedagogy to education; socio-cultural trust and understanding of the new scenario, which revolves around the innovation of MLearning due to teachers and learners addictions to the portable smart device in recent times. The technology of mobile device has come and no turning back, education is vital which need integration for sufficient academic progress among the youth. The study recommends collective efforts and collaborative ascendancy in stakeholders examining the trends of MLearning in the school environment. The ubiquity of mobile device shapes the education of the millennial methods of instruction, in the formal or informal routine as the contribution enables academic progression. The study overlooked the policymakers' inputs, which is vital in the study for adoption into the education curriculum. The government regulations and policies are instrumental to the changes of any pedagogy in education. Teachers and learners desires assimilation as much as policymakers in government do thus ministry of education reasoning to the impact of the technology on education in any developing country.

VI. CONCLUSION

The proposed study aimed at blending the TPB behavior with Noah's mobile learning technology, based on the ubiquity of MLearning among teachers and learners. The opportunity opined to knowledge flow and transfer through MLearning is novel to educational pedagogy in an exploit of multifuctionlity of the case study. The research is conclusive that, the TPB initially satisfied the intention of teachers and learners in the use of MLearning in the school environment coupled with the case study of Noah that seeks to complement primary and secondary coursework into a portable hand-held device for everywhere learning. The results from the study show a positive correlation of the theory and enabling environment with useful perceived experience on the TPB and behavior intention. The research has proven the viability of MLearning posture in reshaping the pedagogy of learning in the school setting. The technology innovation of MLearning in the current dispensation education is significant to avoid leaners misplaced use of smartphone, which is a complement to ICT development. In the expectation of the next research, the primary methodology integration using MLearning formal or informal will examined for smooth flow of knowledge among teachers and students in high schools and colleges. Among the benefits of the study is that; teachers and learners can interact concerning topics discussed in the classroom that needs clarification for assignment and exercises through the medium of WeChat and WhatsApp apps. In future, the study will include policymakers and experts on the technology of MLearning from Noah Foundation for collaboration that the final analysis will yield benefits for developing countries who are criticizing the technology of MLearning trend into the education sector.

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REFERENCES

[1] M. Barak, “Reflective drawings as means for depicting ICTS roles in science and engineering learning in the 21st century,” in *Drawing for Science Education: An International Perspective*, pp. 31–40, 2017.

[2] J. Peeters et al., “Adult learners’ informal learning experiences in formal education setting,” *J. Adult Dev.*, vol. 21, no. 3, pp. 181–192, 2014.

[3] E. H. T. Ko, D. K. W. Chiu, P. Lo, and K. K. W. Ho, “Comparative study on m-learning usage among LIS students from Hong Kong, Japan and Taiwan,” *J. Acad. Librariansh.*, vol. 41, no. 5, pp. 567–577, 2015.

[4] J. Osakwe, N. Dlodlo, and N. Jere, “Where learners’ and teachers’ perceptions on mobile learning meet: A case of Namibian secondary schools in the Khomas region,” *Technol. Soc.*, vol. 49, pp. 16–30, 2017.

[5] M. West and S. Vosloo, UNESCO Policy guidelines for mobile learning. 2013.
[6] M. A. Fakomogbon and H. O. Bolaji, "Effects of collaborative learning styles on performance of students in a ubiquitous collaborative mobile learning environment," *Contemp. Educ. Technol*., vol. 8, no. 3, pp. 268–279, 2017.
[7] M. Beutner and F. A. Rüscher, "Acceptance of mobile learning at Smes of the service sector," pp. 63–70, 2017.
[8] F. Quaye, "The impact of ICT on teaching and learning in tertiary institutions : A case study of Wisconsin International University," vol. 5, no. 5, pp. 8–15, 2015.
[9] Á. Serrano-Laguna, J. Torrente, P. Moreno-Ger, and B. Fernández-Manjón, "Application of learning analytics in educational videogames," *Entertain. Comput*., vol. 5, no. 4, pp. 313–322, 2014.
[10] L. Briz-ponce, A. Pereira, L. Carvalho, J. A. Juanes-m, and F. Jos, "Learning with mobile technologies e Students ' behavior," *Comput. Human Behav*., vol. 72, pp. 612–620, 2017.
[11] A. I. Khan, H. Al-Shihi, Z. A. Al-Khanjari, and M. Sarrab, "Mobile Learning (M-Learning) adoption in the Middle East: Lessons learned from the educationally advanced countries," *Telemat. Informatics*, vol. 32, no. 4, pp. 909–920, 2015.
[12] M. Al-Emran, H. M. Elsherif, and K. Shaalan, "Investigating attitudes towards the use of mobile learning in higher education," *Comput. Human Behav*., vol. 56, pp. 93–102, 2016.
[13] M. Shippee and J. Keengwe, "mLearning: Anytime, anywhere learning transcending the boundaries of the educational box," *Educ. Inf. Technol.*, vol. 19, no. 1, 2014.
[14] O. Oyeleke, F. A. Olugbenga, O. Elizabeth, O. Ayamolowo, and J. Sunday, "Changing the landscape of learning: Critical factors in open and distance learning," *J. Educ. Pract.*, vol. 6, no. 13, pp. 53–62, 2015.
[15] C. Looi et al., "Implementing mobile learning curricula in a grade level : Empirical study of learning effectiveness at scale," *Comput. Educ*., vol. 77, pp. 101–115, 2014.
[16] H. Kimiloglu, M. Ozturan, and B. Kutlu, "Perceptions about and attitude toward the usage of e-learning in corporate training," *Comput. Human Behav*., vol. 72, no. 2017, pp. 339–349, 2017.
[17] G.-J. Hwang, H.-Y. Sung, C.-M. Hung, I. Huang, and C.-C. Tsai, "Development of a personalized educational computer game based on students' learning styles," *Etr&D-Educational Technol. Res. Dev*., vol. 60, no. 4, pp. 623–638, 2012.
[18] T. Brahimi and A. Sarirete, "Learning outside the classroom through MOOCs," *Comput. Human Behav*., vol. 51, pp. 604–609, 2015.
[19] Y. Park, "A pedagogical framework for mobile learning: Categorizing educational applications of mobile technologies into four types," *Int. Rev. Res. Open Distance Learn*., vol. 12, no. 2, pp. 78–102, 2011.
[20] Y. Baek, H. Zhang, and S. Yun, "Teachers' attitudes toward mobile learning in Korea," *Turkish Online J. Educ. Technol*., vol. 16, no. 1, pp. 154–163, 2017.
[21] C. Wongwatkit and P. Panjaburee, "A proposal to develop a guided-inquiry mobile learning with a mastery learning mechanism for improving students' learning performance and attitudes in physics Charoenchai," *Int. J. Mob. Learn. Organ*., vol. 11, no. 1, pp. 63–86, 2017.
[22] Y. Liu, L. Jun, and Y. Shengquan, "A case study on mobile learning implementation in basic education," *Proc. - Int. Conf. Comput. Sci. Softw. Eng. CSSE 2008*, vol. 5, no. May 2014, pp. 593–597, 2008.
[23] I. Ajzen, "Behavioral interventions based on the theory of planned behavior."
[24] iSALT Team, "Theory of planned behavior," iSALT Resour. Theor. Concepts, Meas. Pap. 1, vol. 6654, no. V, pp. 1–4, 2014.
[25] I. Ajzen, "Constructing a theory of planned behavior questionnaire," *Biofeedback and selfregulation*, vol. 17, pp. 1–7, 2010.
[26] J. A. Adetoro, S. A. Oyebade, M. A. Oladejo, and J. Azi, "Learning on the move: The behavioural intentions of nigerian students with disabilities," *Proc. Int. Conf. e-Learning, ICEL*, vol. 6, no. 1, pp. 1–10, 2017.
[27] R. K. Sungkur, A. Panchoo, and N. K. Bhoyroo, "Interactive Technology and Smart Education For Authors Augmented reality, the future of contextual mobile learning," *Interact. Technol. Smart Educ. Interact. Technol. Smart Educ. Iss Interact. Technol. Smart Educ*., vol. 13, no. 1, pp. 123–146, 2016.
[28] Y. Yen et al., "The predictors of the behavioral intention to the use of urban green spaces: The perspectives of young residents in Phnom Penh, Cambodia," *Habitat Int*., vol. 64, pp. 98–108, 2017.
[29] Y. Liu, L. Jun, and Y. Shengquan, "A case study on mobile learning implementation in basic education," *Proc. - Int. Conf. Comput. Sci. Softw. Eng. CSSE 2008*, vol. 5, no. January, pp. 593–597, 2008.
[30] S. Disagree and S. Agree, "Cronbach ' s Alpha," Real Stat. Using Excel, pp. 1–38, 2014.
[31] D. Beglar and T. Nemoto, "Developing Likert-scale questionnaires," in *JALT2013 Conference Proceedings*, 2014, pp. 1–8.
[32] J. F. Hair, M. Sarstedt, L. Hopkins, and V. G. Kuppelwieser, "Partial least squares structural equation modeling (PLS-SEM): An emerging tool in business research," *Eur. Bus. Rev*., vol. 26, no. 2, pp. 106–121, 2014.
[33] IBM, "SPSS Software," Predict. Anal. Softw. Solut., p. 1, 2015.
[34] J. F. Hair, M. Sarstedt, T. M. Pieper, and C. M. Ringle, "The use of partial least squares structural equation modeling in strategic management research: A review of past practices and recommendations for future applications," *Long Range Plann*., vol. 45, no. 5–6, pp. 320–340, 2012.
[35] L. Wang, Z. Liu, X. Jin, and Y. Shi, "Reliability estimation based on the degradation amount distribution using composite time series analysis and grey theory," *Cybern. Inf. Technol*., vol. 13, no. 3, pp. 3–14, 2013.
[36] R. A. Peterson, "Meta-analysis of alpha cronbach â€TM s coefficient," *J. Consum. Res*., vol. 21, no. 2, pp. 381–391, 2013.
[37] Ghana Statistical Service and Ghana Demographic Health Survery, Ghana Demographic and Health Survey 2008: Ghana Statistical Service, Ghana Health Service, Ghana AIDS Commission, 2008.
[38] C. Fornell and D. F. Larcker, "Evaluating structural equation models with unobservable variables and measurement error," vol. 18, no. 1, pp. 39–50, 2016.
[39] R. M. Frey, R. Xu, and A. Ilic, "Mobile app adoption in different life stages: An empirical analysis," *Pervasive Mob. Comput*., vol. 40, pp. 512–527, 2017.
[40] S. Levy, "How Google Is Taking Search Outside the Box," Backchannel, 2015. [Online]. Available: https://medium.com/backchannel/how-google-is-taking-search-outside-the-box-678e794e07bf.
[41] K. K. Stephens and G. E. Pantoja, "Mobile devices in the classroom: learning motivations predict specific types of multicommunicating behaviors," *Commun. Educ*., vol. 65, no. 4, pp. 463–479, 2016.
[42] A. E. E. Sobaih, M. A. Moustafa, P. Ghandforoush, and M. Khan, "To use or not to use? Social media in higher education in developing countries," *Comput. Human Behav*., vol. 58, pp. 296–305, 2016.
[43] C. L. Kee and Z. Samsudin, "Mobile devices: Toys or learning tools for the 21stcentury teenagers?," *Turkish Online J. Educ. Technol*., vol. 13, no. 3, 2014.
[44] J. Kuria Waitara, "Modeling adoption and usage of mobile money transfer services in Kenya using structural equations," *Am. J. Theor. Appl. Stat*., vol. 4, no. 6, p. 513, 2015.