

# The effect of Peer Formative Type of Assessment on Developing Mobile Training Skills and Attitude for the Pre-Service Teachers

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**Abstract:-** This research traced the effectiveness of formative type of peer assessment in developing pre-service teachers' mobile learning skills and attitude. Extended one group with pre-test, post- test experimental design was adopted as the research plan. A total of thirty (30) pre- service teachers drawn from different departments in Isa Kaita College of education Dutsinma Katsina State Nigeria, undergone a four (4) weeks online training in Google classroom and WhatsApp on mobile learning skills development. Before and after the training, a twenty (20) items multiple choice questions mobile learning skills achievement test and a twenty (20) items five (5) points likert type rating scale were applied as the pre- test and post –test. Descriptive statistics of mean, standard deviation, paired sample t-test at ( $p \leq 0.05$ ) were the techniques engaged in the elicited data analysis. The research outcomes revealed that peer formative assessment type critically enhanced academic achievement and positive attitude of pre-service teachers. Therefore state ministry of education and universal basic education board may organise a training programme specifically to equip their staff with necessary skills to apply the model.

**Keywords:-** Formative assessment, peer assessment, mobile training skills, attitude.

## I. INTRODUCTION

Assessment in schools has now been transformed from individualized and delayed classroom practices, to a 21<sup>st</sup> century transformative type, inform of group based, lessons and units oriented forms of assessments that are capable of providing teachers and learners with a timely feedback about the quality of their instructional methods and resources, this form of assessment is the formative type of peer assessment.

Formative type of peer assessment is an assessment type practiced in schools, with the aim of adapting assessment strategies from teacher centric to a learner oriented, from isolated typology to an integrated kind and from assessing small group to the assessment of many.

This type of assessment support learners with diverse opportunities for reflection on their own ideas in a learning domain, as well as developing their sense of belongings to assess their understanding, and that of others, with a view to

clarify and close up the existing learning gaps. These ideas emanated from social and cognitive constructivists approach to instruction, (Dessie & Heeralal, 2016).

The prevalence of technology devices and applications especially mobile devices with large memory size, processors, good screen displays, long, the emergence of Web 3, 4 and 5G network are some of the practical reasons for the instructors, learners and researchers embrace mobile technology as one of the techniques of educational pursuit and delivery in the present generation.

Mobile training is a technique to instruction delivery that utilizes the benefit of mobile technologies to deliver and access instructional contents, is one of the innovative and promising means of instruction and the 21<sup>st</sup> century skills leading to the transformative and augmentative form of learning that now cater for all levels of learners and learning personalities.

The technique entirely reverses the traditional learning culture by offering learners with more learning engagement and contents access at all the time, as well as providing lifelong education that enable learners learn through technology and with technology.

Learners are able to send and receive information from and to the teacher through several platforms and applications anytime, anywhere. Thus, mobile technologies and wireless devices are now evolving in different sectors of life.

The integration of mobile devices and applications such as smart phones, mobile phones, PDAs, tablets, personal computers, MP3 and MP4 are gaining ground, this is because of their availability, low cost, portability and interest among the learners and instructors all together. Teachers and students now enjoy the mobility of learning through the technology as it boost their activities of teaching, learning as well as their personal endeavors.

From our experiences mobile technology devices are possessed by more than 90% of the pre-service and in-service teachers at both primary and post primary level of education, however, the utilization of these devices in the teaching learning practices at utmost level at these stages of education still remains question.

## II. PROBLEM STATEMENT

Despite the effectiveness of the formative type of peer assessments to the teachers and learners, which enable learners to think and reason critically, perform routine operations, monitor their learning progress and that of others during instruction.

From experience pre-service and in-service teachers at primary and post primary levels, lack adequate knowledge and skills to properly implement this type of assessment technique in their teaching activities especially with mobile technology devices.

These problems emanated from lack of adequate training given to the teachers (both service and pre-service) on how to design and implement peer assessment with mobile technologies, although they possessed the devices, they often used them mainly for social and entertainment activities, instead of academics.

Therefore this study intends to train pre-service teachers on developing necessary skills on how to design and implement formative type of peer assessment using mobile technology devices and applications.

## III. OBJECTIVES OF THE STUDY

The aim of this study is to determine the effectiveness of formative type of peer assessment on developing mobile training skills of pre-service teachers. The following specific objectives were formulated:

- To determine the effect of peer assessment on developing mobile training skills of the pre-service teachers.
- To determine the effect of peer assessment on developing attitude of the pre-service teachers.

## IV. RESEARCH HYPOTHESES

The research will be guided by the following hypotheses

- There is statistical significant difference in test scores between pre – and post - application of mobile training skills development achievement test among the pre-service teachers.
- There is statistically significant difference in test scores between pre – and post application of attitude questionnaire on the effect of peer assessment among the pre-service teachers.

Although the term peer assessment has been described by cluster of authors in educational technology field, Li and Gao (2015) arouse a common view that, is an assessment type where peer colleague evaluate their fellows activities with the use of performance rubric.

Thus student to student assessment varies from self and teacher assessment in the sense that a performance criteria is designed by the teacher to serve as critique of a fellow's work reference. Students that are engaged in a formative assessment serve dual role as assessors and assessee, (Francis & Gonozi 1995).

Peer assessors are mandated to review their fellow students work and provide feedback, Li, liu & Steckelberg, (2010), Zhou, (2012), in Li & Gao, (2015), while as assessee, they read and act upon their peer observations and recommendations to improve their work, (Double, Mcgrane and Hopfenbeck, 2019).

The mechanisms, by which students' perceived peer assessment can contribute to their learning Ndoye (2017), are feedback, clarification of expectations and the ability to collaborate and create positive learning environment.

Trainers should note that, feedback is very vital element in students learning, and formative peer feedback is a live and simultaneous to the work done at the moment, it is geared towards closing the gaps identified from what the learner missed in the classroom.

To that effect, the learners' attitude towards learning and assessment are shaped and modified by peer assessment and feedback, some learners find it difficult to accept open critique, however the influence of peer feedback and its benefits towards learning may alter this attitude so as be ready to accept and welcome constructive challenges.

Moreover Ndoye (2017) pinpointed that the ability to provide an authentic data related to the course content, clearly stated objectives of the training activities, such as the assignment, home work, class work, class discussion and the fundamentals that will guide the overall performance are ways by which peer assessment practices promote students motivation towards learning.

The goals and benefits of peer assessment are married with the ability of peer assessors to properly utilize standard evaluation rubric to assess and produce authentic and outright feedback, which led to higher student academic achievements, when peer assessment data is obtained and compared to the teacher's assessment data, (Bukharaev and Altaher, 2017, Okeke and Iheanacho, 2015).

Additionally peer assessment sought to improve learners' academic strength, evaluation skills and ability to become independent assessors, and fosters learners' engagement, develop their thinking skills and enable them demonstrate their intrinsic skills. (Spiller 2009)

It is worthy to note that several forms of peer assessment practices Double, McGrane and Hopfenbeck (2019), Li & Gao (2015) were unmasked, and hitherto adopted by teachers in schools, purposely to promote collaboration and other peer activities synchronous and asynchronously.

- Classroom traditional peer assessment: This occurs inform of general classroom assessment activities, like peer dialogue, where the colleague work is reviewed, formative feedback are provided inform of comments and observations, the qualitative written comments such as constructive criticisms, observations and comments made by the peer assessor in the classroom are transmitted to the assessee for consideration.
- Scaffolding peer assessment: In this type, the peer assessor is scaffolded by an assessment rubric and scoring scripts

prepared by the teacher to serve as a guide in order to obtain a qualitative, reliable and effective feedback.

The rubric will also reduce the possibility of over or underscoring by the peer assessor and thereby improving the accuracy of the assessment.

- **Online Mode peer assessment:** Sequel to the technological advancement and its effect in the education sector, peer assessment practices that were implemented offline are now being implemented online, this include all the offline classroom activities such as discussions, collaborations and evaluation, are effectively carried out on the web, which also stagger the issue of logistics.
- **Hidden peer assessor:** The reliability of peer assessment feedback is increased when the peer assessor is anonymous, this will reduce scoring bias as a result of interpersonal relation among the peers and increase assesses confidence.
- **Experience peer assessor:** Some educational scholars were at the view that novel peer assessors tend to provide limited feedback which hinders its effectiveness and positive perceptions of the assessed.

Therefore more training and retraining of peer assessors will improve their experience, skills and quality of their feedback.

- **Peer assessment influenced by electronic devices:** This form of assessment tries to incorporate technology electronic or ICT devices to mediate in the assessment practices of the peers.

The mediation uncovered a new trend in the educational sector, especially in the area of assessment, that now assessment is no longer confine to brick and mortar structure, it's flexible interactive and promising.

The system utilizes soft and hard ware tools that enable the learners to actively engage in the assessment of their peer irrespective of time and venue, the system offer solution to some of the challenges the traditional system faced.

The system apart from text method of providing feedback utilizes other means such as videos, audio, interactive simulation, graphics, it's also considered as a strategy that provide benefit of anonymity of the assessor and assessed, ease of management, flexibility, proximity.

Mobile learning or M- learning as popularly known is a sub set of e-learning. Thus e-learning is a general term representing electronic learning and other forms of internet base and technology mediated learning in which mobile learning is part of it.

Mobile learning therefore attract various definitions from educational scholars, for instance Unesco and ITE, (2010) in Kabir and Kadage (2017) conceptualized it as a strategy that utilized benefits offered by technology to deliver instruction in a flexible and un predetermine environment.

Thus any form of learning capable of breaking barriers between learning and work life, at the same time enables learners to connect to learning anywhere and negate learning to be activity occurring in a fixed establishment is recognized

as mobile learning, (Kabir & Kadage 2017, Oyelere, Suhonen & Sutinen 2016).

This type of learning provide an opportunity for learners to gather and share learning contents digitally via personal portable devices such as PDAs, smart phones and other mobile gadgets, (Mehta, 2016, Yurdagul & Oz, 2018, Marwan, Madar & Fuad 2013).

The heightened of mobile learning in the educational sector has been attributed to the widespread of portable technologies and wireless mobile phones and other networks, Hashemi, Azizinezhad, Najafi & Nesari (2011), Chaka & Govender (2014), adopted by teachers to facilitate teaching and improve learning.

The studies by Al-Emran & Shaalan (2015) revealed that attitude of faculty members and students towards the application of mobile learning in higher institutions of Arab countries of Oman and UAE, indicated that UAE staff and students were positive towards mobile learning than Oman, there were no attitudinal deviations in relation to gender on the subject.

However, a diverse opinion from Onaolapo and Oyewole (2018) proved that performance was very strong to influence the use of smart phones as mobile learning tool, and as such most of the postgraduate students used their smart phones for mobile learning.

To further ascertain its worthiness and otherwise, Shohola & Joy (2014), Yusuf and Nathan (2016), assert that faculty members in the Nigerian institutions of learning were only adamant on content development and delivery, while paying little or no attention to monitor privacy and security of the contents delivered, therefore concluded that mobile learning contents were threatened by its veracity and confidentiality.

There are numerous features, by which mobile learning could be detected narrated in various literatures; Ozdamli and Cavus (2011); Kabir and Kadage (2017), Bukharaev and Altaher (2017) emphasized on the under listed:

- Mobile learning is prevalent; It can take place anywhere, anytime.
- Mobile learning is just-in-time: This delivers learning contents always at the point of need.
- Mobile learning is collaborative: This is a feature that facilitates communication and discussion in a group and with international information network.
- Mobile learning is hybrid: It is integrated with other applications and software to deliver the information.
- Mobile learning is elastic : This does not require specific or fixed environment.

Apart from the grandness derived from mobile learning, described in different research articles. Oguchinalu and Sunday, (2018), of Hashemi et al (2011) authored some privileges reaped from its application in education sector, signposted by the ability to create, disseminate and distribute educational resources within and outside a group without hesitation.

Several mobile devices divulged by Hashemi et al (2011) are commonly utilized to enhance dynamicity and portability of instructional environments. These consists the endorsement of mobile phones, smart phones, personal digital assistants (PDAs), and handheld gaming devices (e.g. Sony Psp, Nin ten do DS).

Moreover, Alsaadat (2017), Hashemi et al (2011), Chaka and Govender (2014) unveiled the under mentioned technologies crucial to teachers who intend to adopt mobile learning as a strategy to teach their subjects:

- WAP: A wireless application protocol, which is an international connectivity that enable mobile devices to connect to internet services
- GPRS ( general packet radio services), An internet connection specifically for mobile devices that provide greater speed for the transfer of data across various networks
- Bluetooth: A wireless connection that enable mobile devices to share information without internet
- MP3 &MP4: A podcast file format that enable audio data to be compressed and shared
- 3G & 4G devices: A third and fourth generation network that enable quick transmission of multimedia data.
- MMS: Multimedia message services: A message system that in addition to text information convey graphical data through smart devices

- E- book readers: Such as the adobe reader acrobat and portable document file (PDF) to download and store and share text based instructional materials easily
- Message box drive: Serve as a big data repositories

*A. Research methodology*

The researcher adopted the following methods for the study:

*B. Research design*

This research adopted an extended one group with pre-test post test experimental design method to determine the effect of treatment to the sample of the experiment.

*C. Area of the study*

This study was conducted at Isa Kaita College of Education Dutsinma Katsina State Nigeria.

*D. Subjects*

The populations of the study are the pre-service teachers in Nigeria; the target populations are the pre-service teachers of Isa Kaita College of Education Dutsinma, Sample of the study comprises thirty (30) level three (3) pre-service teachers derived from different departments of the college.

The sampling technique adopted was purposive, meaning that only pre-service teachers who possess mobile devices (mobile phones, smart phones, tablets) participated in the research. Table1, below presented the detailed demographic features of the research sample;

Table 1: Demographic data of the subjects

Gender	F	Frequencies	Percentages
	M	18	60%
Level		12	40%
		300	100%
Age	18 – 20 years	11	36%
	21 - above years	19	64%
Department	Sciences	4	13%
	Arts/Humanities	5	17%
	Voc & tech educ.	6	20%
	PED/ECCE	15	50%

From table 1 above, the sample size consisted eighteen (18) and twelve (12) female and male students representing 60% and 40% of the participants respectively, out of thirty (30) participants eleven (11) representing (36%) were between the ages 18 – 20 years and nineteen (19) representing 64% were 21 years and above. All the participants were level three (3) students and four (4) representing 13% were from sciences, five (5) of the participants representing 17% were from Arts and Humanities, while six (6) representing 20% were from Vocational and technical, the remaining fifteen

(15) equivalent to 50% were from PED and ECCE departments.

*E. Data collection instruments*

The researcher utilized the following tools and elicited data from the research subjects:

- Mobile training skills development achievement test
- Five (5) points likert type attitude questionnaire

*F. Validity and reliability of the instruments*

To ascertain the quality of items, face and construct of the two (2) research instruments, they were referred to some skilled educational technologist, for their observations and inputs, as such errors and ambiguities were removed and positives were added, finally the tools were credited as credible and appropriate to be applied to the reference point.

To determine the items level of consistency, the researcher conducted two (2) weeks pilot study with some selected subjects that were out of the sampled galleries, the two instruments were applied to them after the treatment, data were collected and analyzed, and the internal consistency, Cronbach alpha  $\alpha$  values .982 and .831 were obtained, indicated 98.2% accuracy of the achievement test and 83.1% consistency of the attitude scale, these unveiled a very high level of consistency of the two items to elicit the desired information needed.

#### G. The eLearning environment

The eLearning management system adopted for this research study was the Google classroom, the rationale for the assent were that, the systems is a free mobile application, and available in all android versions of mobile phones, its therefore easy for the participants to download and install into their devices and join the programme.

#### H. Experimental procedure

For the researcher to apply the treatment course materials to the research sample, the participants were directed to log into the mobile training environment created by the researcher, to access the treatment resources shared (video, text documents and power point slides), the participants learned the theoretical part on their own, (Behaviorism), then engaged in an active learning process via discussion, quizzes, comments and observations in the comment section of the Google classroom, within the scope of the training contents of every unit, (Constructivism).

The participants also engaged in higher order thinking activities by creating their own personal learning environment, design, production and application of mobile learning with some selected students to practice their developed skills. Peer colleagues monitored and assessed their peers' product under trainer's supervision and using the peer assessment rubrics provided by the trainer.

Peer formative feedbacks were provided by the peer assessors, inform of comments, critiques and other modalities. The participants were at liberty to consult the trainer for any assistance via the online platforms. Below is the scheduled of the experimental treatments.

Table 2: Schedule of enquiry: Duration: Four (4) weeks, begins from 1<sup>st</sup> - 30<sup>th</sup> April, 2023

Week	Treatment/ activity	Assessment
<b>Week one (1)</b> 1 <sup>st</sup> – 7 <sup>th</sup> July 2023	<ul style="list-style-type: none"> <li>- General guidelines and objectives of the training</li> <li>1. Introduction of the first module: introduction to mobile learning (concept, characteristics, rationale, components, forms).</li> <li>- Activities.</li> <li>2. The second module: mobile learning design, use of ADDIE instructional design model, to design mobile instruction,</li> <li>- Activities.</li> </ul>	-Formative assessment peer type and feedback
<b>Week (2)</b> 8 <sup>th</sup> – 15 <sup>th</sup> July, 2023	<ul style="list-style-type: none"> <li>1. Third module: mobile learning production (Media generation, sites to access online media).</li> <li>- Activities.</li> <li>2. The fourth module: mobile learning implementation ( use of Google classroom), upload resources, create activities, quizzes)</li> <li>- Activities.</li> <li>3. The fifth module: Assessments: (formative assessment tools, use of Google docs and forms, peer assessment, feedback)</li> <li>- Activities.</li> </ul>	-Formative assessment peer type and feedback.
<b>Week 3</b> 16 <sup>th</sup> – 24 <sup>th</sup> July, 2023	<p><b>(product phase)</b></p> <ul style="list-style-type: none"> <li>- Creation of Google classroom by all the participants</li> <li>- Assign class code to enroll users and upload resources.</li> </ul>	
<b>Week 4</b> 25 <sup>th</sup> – 30 <sup>th</sup> July, 2023	<p><b>(Assessment of product)</b></p> <ul style="list-style-type: none"> <li>- All participants are to use the Google classroom they have created to teach a course in their areas of specialty.</li> <li>- Assessment of products (peer assessment) using trainer's assessment rubric</li> <li>- Application of post – test achievement test and attitude scale.</li> </ul>	

#### I. Data analysis

Descriptive statistics of mean and standard deviation, paired sample t-test and correlation coefficients were used to analyze the data obtained, and determine the cognitive and affective differences of pre-service teachers, on the

achievement tests and attitude questionnaire from pre- test and post test application.

**V. RESULTS AND DISCUSSION**

The results and findings of the research were presented and illustrated under the bearings below:

*A. Findings in respect of pre – test and post – test concerning mobile learning skills development achievement test*

To examine the impact of peer formative assessment type on developing mobile learning skills, pre –test and post – test were dispensed, and results collected, average scores were extracted to determine if there is any important variation between them by means of paired sampled t – test. Table 2 below, clarified the results.

Table 3: Mean, standard deviation, paired sampled t – test and correlation coefficients in respect of pre – test and post – test success scores concerning mobile learning skills development achievement test.

Experimental group	Test type	No of items	Mean	Mean Difference	Standard deviation	Correlation coefficients	2 tailed sig.	Remark
Peer type	Pre test	20	5.65	-4.1	2.834	.334	0.00	Sig.
	Post test	20	9.75		2.845			

Table 3 above, unfolded the essential variation of the average scores between pre- test and post –test in the mobile learning skills development achievement test, the post test average score was 4.1 higher than the pre – test, 5.65 (SD, 2.8340 and 9. 75 (SD, 2.845) pre and post – test respectively, Also .334 correlation coefficient was observed, which indicated a low relationship between the scores.

The 2 tailed significant values was .00 below the 0.05 confidence level, therefore since the 2 tailed values is less than the 0.05 p value, null hypotheses has been rejected, which implied that peer formative type of assessment is effective in improving the academic achievement of the subjects.

To substantiate the findings Spiller (2009) exploits the impact of peer assessment like improving learners’ academic strength, evaluation skills and ability to become independent

assessors, fostering learners’ engagement, develop their thinking skills and enable them demonstrate their intrinsic skills.

Besides that, Okeke and Iheanacho (2015), Bukharaev and Altaher (2017) opined that peer formative assessment was considered to be instrumental towards promoting skills of students to utilize standard evaluation rubrics to produce authentic an outright feedback that led to higher student academic achievements, when peer assessment data is compared to that of teacher’s assessment.

*B. Findings in respect of pre – test and post – test concerning emotional feelings of the experimental group*

To divulge the possible impingement of peer formative assessment type on developing positive attitude, pre – test and post –test results were compared by paired sampled t – test, and the outcomes are presented in table 4 below:

Table 4: Mean, standard deviation, paired sample t-test and correlation coefficients in respect of pre –test post –test concerning attitude questionnaire

Experimental group	Test type	No of items	Mean	Mean Difference	Standard deviation	Correlation coefficients	2 tailed sig.	Remark
Peer type	Pre test	20	13.00	-3.5	5.477	.547	.153	Sig.
	Post test	20	16.50		5.206			

From the table above, the computed weighted mean scores in respect of pre- test and post test were 13.00 (SD, 5.477), 16.50 (SD, 5.206) which revealed that pre –test average scores were 3.5 lower than post – test average scores, also .547 correlation coefficients indicated a medium correlation between the scores, the 2 tailed significance value were .153 at  $p \leq 0.05$  significance. This result led to the acceptance of null hypotheses, since the 2 tailed values is greater than 0.05 confidence level. It implied that peer formative assessment has no influence on developing positive attitude of the trainees.

The finding opposed the opinion of Ndoye (2017), that learners’ attitude towards learning and assessment are shaped and modified by peer assessment and feedback, since some learners find it difficult to accept open critique, the influence of peer feedback and their benefits towards learning quite alters their attitude and be ready to accept and welcome constructive challenges.

To confirm the finding further Al-Emran & Shaalan (2015) studies revealed that attitude of faculty members and students towards the application of mobile learning in the higher institutions of different countries were positive, especially in the Arab league countries of Oman and UAE, and also gender variation does not canvass any significant differences in terms of interest and usage of mobile learning.

**VI. CONCLUSION AND RECOMMENDATIONS**

The research sought to determine the effect of peer formative assessment type on improved achievement and positive feelings of pre –service teachers in mobile learning skills development. Outcome indicates that peer assessment (formative type) has greater yield in improving cognitive and emotional skills of pre-service teachers if properly implemented.

Instructors who are willing to adopt mobile learning as an instructional strategy in their teaching subjects, are to acquire the necessary knowledge and skills, as a panacea to ensure effective implementation, therefore state universal basic education board may organise a training programme specifically to equip their staff with necessary skills to apply the model.

Moreover the study was conducted with only thirty (30) pre – service teachers, further studies may increase the number of participants to include more, so also further studies may be carried out to determine the effect of other assessment types such as trainer and self formative types of assessments on developing skills other than mobile learning. Like adaptive learning skills, web quests, flipped classroom skills, blended learning skills and so on.

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