

# The Use of E-Cooperative Learning Strategy as Innovation for Transforming Mathematics Education in Nigeria

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## ABSTRACT

This paper discussed changes in pedagogies that always bring about transformation and innovation in Mathematics Education. These change was discussed from pre-colonial era till present day and the change is due to rising needs in Nigeria. The changed and long existed pedagogies were listed and the e-cooperation Learning strategy which is an innovative strategy was discussed in this paper. Cooperative Learning strategy was chosen in this paper with the reason that literature been reviewed so far in this paper showed that the strategy has been highly effective severally in Mathematics. Whasts App Video-call which is an aspect of technology was also discussed. That is, if this technology is integrated to Cooperative Learning Strategy it will now becomes e-cooperative learning strategy or cooperative WhatsApp Video-Call learning strategy. This e-cooperative learning strategy is possible to be an innovative way of transforming Mathematics Education in Nigeria. This paper concludes that transformation and innovation that have being occurring in Mathematics at different stages since the pre-colonial era used to be as a result of rising needs in Nigeria. Using appropriate pedagogies is a veritable tool for transformation and innovation in Mathematics Education. Consequently, the use of e-cooperative learning strategy as discussed in this paper showed to be an appropriate innovative strategy that is possible to bring a reasonable transformation to Mathematics Education in Nigeria, especially in this era of information and communication technology. Based on this discussion, the paper recommends that, for more transformation in Mathematics, the long existed and other pedagogies should be combined with technologies and let these innovative pedagogies if possible be practiced at all levels of Mathematics Education.

**Key Words:** Transforming, Innovative, e-cooperative, WhatsApp Video-call, Mathematics, Education, pedagogies.

## INTRODUCTION

In the history of Mathematics Education, right from pre-colonial era till date, the subject, Mathematics has never stopped experiencing transformation and innovation. Mathematics Education continues to change programme, curriculum and pedagogy from one to another as the need arises. These changes at the end always result to transformations and innovations. This paper focused on changes in pedagogies. Examples of such needs that result to changes in pedagogy include, the kind of Arithmetics the white men (including missionaries) would need to run commerce with Nigerians as at pre-1960s, the worry of the mass failure of the Nigerian learners in Entebe mathematics education, the difference in mathematics education among the then existing regions in Nigeria. In this case, Nigerian educators that time ensured mathematics education be a unified subject as it is in Nigeria today, incessant failures in Mathematics and the present day happening of examination Malpractice. Sequel to the afformentioned, these changes for expected transformations and innovations in mathematics education for over 60 years will continue to infinity.

Examples of the arising Pedagogies as a result of these needs for the purpose of transformation and innovations in Mathematics Education in Nigeria are; lecture method, demonstration method, discovery method (Harbor-Peters,2001), concept mapping method (Imoko,2004), ethnomathematics method (Uloko,2006), games method (Agwagah,2001), simulation method, play-way method, peer-tutoring method (Uloko,2010), cooperative learning strategy (Chianson, 2008).

One of the present needs that demand the change for teaching methods in mathematics for transformation and innovation currently is the issue of technologies that have come into existence now. Technology is the application of the acquired scientific knowledge in practical ways especially in industry (Hornby, 2005). Industry as mentioned in this definition, among others could be education industry, medical industry and commerce industry. Technology in this paper could be defined as application of the acquired scientific knowledge in practical way particularly in educational industry. Example of such technology among others include, Artificial Intelligence, Video game, 3D printing, information and communication technology. Chosen in this paper and discussed is an aspect of information and communication technology (ICT) called WhatsApp Video – call. The choice of WhatsApp in this paper is because many learners are familiar with it. According to Achor (2024), ICT is advised not to be treated in isolation rather it should be integrated with the long existed teaching methods for transformation. According to Tiedeman (2018), cooperative learning strategy is a teaching strategy that existed for over 30 years. In agreement with Achor (2024), and Tiedeman (2018), cooperative learning strategy is therefore chosen to be integrated with the aforementioned technology. As a result of combining it with the technology in this paper, its name has to be changed from cooperative learning strategy to e-cooperative learning strategy or it can be called cooperative WhatsApp Video-call learning strategy. It is good to know that, another choice for cooperative learning strategy to be integrated with the chosen technology is that reviewed literatures have shown that the strategy has been highly effective in Mathematics severally.

### **Cooperative Learning Strategy and Meaning**

Cooperative Learning Strategy according to Shaheen (2020), is an instructional use of small groups so that students work together to maximize their own and each other's learning. This definition shows that when students learn together in a small group, they understand better. To Tiedeman (2018), the group members should be of learning purpose and not only for the purpose of solving assignment or for immediate mathematics academic performance. This shows the strategy should be of long intensive memory purpose. Cooperative Learning according to Liew and Noraine (2017) is a teaching strategy that encourages students to assist each other in a small group to achieve a common goal. Each student in the group has the responsibility to share opinion, work together and solve the mathematics problems. Emphasis here is that the strategy is of the type that encourages harmony. Cooperative learning is viewed in this paper as an instructional strategy that disintegrates the entire learners into small groups of 2-3 members who come together physically to learn, share ideas, work together, have social interaction with themselves, always aiming at gaining more understanding especially that every member is ever ready to contribute his/her knowledge (which make the members to learn faster) and the teacher should be reachable to guide them so as to make their task meaningful. Cooperative learning is possible to be used at any level of learning. According to Tiedeman (2018), the strategy can even be used with kindergarten learners.

### **Review on the Effect of Cooperative Learning Strategy on Achievement of Learners in Mathematics.**

Literature has shown that many researchers and mathematics educators have carried studies on the effect of the use of cooperative learning strategy on learner's achievement in mathematics. Examples, Edekor and Agbornu (2020). In their study been conducted in volta Region of Ghana and 266 Junior High School 2 Mathematics students, using the following statistical tools, Product Moment Correlation, Adjusted Mean, Standard Deviation and Analysis of Covariance (ANCOVA), their result revealed that the strategy is more effective in mathematics than the traditional method. Other researchers, Umar, Ibrahim and Musa (2022). In their study using 240 to determine the effect of the strategy on the mathematics performance of senior school students in Sokoto State, the result showed that the strategy is more effective than the conventional method. In the study of Shaheen (2020), 50 secondary School Students of Aurangabad City were selected by random sampling technique. The researcher made use of ANCOVA and the result showed that the strategy is effective than the traditional method. Another researcher Han (2015), carried out a study to determine the effectiveness of the application of cooperative learning to college English listening classes in China. Questionnaire pretest posttest and interviews were administered. The result showed that cooperative learning is significantly an effective strategy for learner's communicative competence and English listening classes.

With the reviewed empirical study so far, this paper agrees that cooperative learning strategy is an effective strategy for learning.

## Whatsapp Video-Call Operation

In this paper, smart/android phone is use to explain the operation for the fact that, Laptop, and some other ICT facilities are sometimes not easily available.

WhatsApp Video-call occurs when an individual with a smart/android phone has data and ensure the data is on. He goes to notify the person(s) he wants to have video call with and the person(s) also ensure he has data and data is on as well.

Both of them move to Whatsapp platform and the caller will now tap the contact of the person he want to call and the page come up. At the top right corner of that page, there is a three (⋮) icon, the caller will tap it and another options will appear. He will then click on view contact which is one of the options and this will take him to a page with options again. He will click on video option which takes him to another page with options and immediately call begins. As soon as the receiver picks the call, they both will begin to see themselves and discussion goes. At the top right corner of that page there is an icon of contact sign with plus. If the caller clicks on it while the call is going on, another page will open showing other people's contacts that the caller has. He will then click on the contact of his choice and an option will appear under the page as "add to call". The caller will further click on the option and the second receiver with the first will all appear. The receivers are now two joining the caller with the discussion.

## The Use of E-Cooperative Learning Strategy

A researcher, Uloko (2022), in the study of effect of the use of WhatsApp voice-call teaching platform during COVID-19 lockdown on primary one and two pupil's performance in mathematics, advised that mathematics educators and researchers should carryout research on pedagogies with the use of WhatsApp platform. Sequel to this advice also, this paper chose to discuss the use of e-cooperative learning strategy which is a strategy that has to do with the integration of WhatsApp Video-Call and the Cooperative Learning Strategy. E-cooperative learning strategy as defined in this paper is, the learning strategy whereby the entire learners are disintegrated into small groups with members of 2-3. Unlike the old or analog Cooperative Learning Strategy, the members will not be together physically rather they interact by the aforementioned operation. All the members including their teacher are expected to have android or smart phones. Their teacher is reachable too like the analog Cooperative Learning Strategy. E-cooperative Learning Strategy has all and more advantages than the former strategy except if the learners or the teacher do or does not have data, having network problem or running down of batteries.

If the teacher and the members know the operation of WhatsApp Video-Call very well and if the mentioned challenges are not there, the strategy is possible to be more effective in Mathematics than the former. In addition, if in the study of Uloko (2022) that teaching, learning and evaluation of pupils in primary one and two could prevail COVID-19 Lockdown, it is possible that this strategy can operate in the same and similar situations.

## CONCLUSION

This paper concludes that transformation and innovation that have being occurring in Mathematics at different stages since the pre-colonial era used to be as a result of rising needs in Nigeria. Using appropriate pedagogies is a veritable tool for transformation and innovation in Mathematics Education. Consequently, the use of e-cooperative learning strategy as discussed in this paper showed to be an appropriate innovative strategy that is possible to bring a reasonable transformation to Mathematics Education in Nigeria, especially in this era of information and communication technology.

## RECOMMENDATION

Based on this discussion the paper recommends that, for more transformation in Mathematics, the long existed and other pedagogies should be combined with technologies and let these innovative pedagogies, if possible be practiced at all levels of Mathematics Education.

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