

Strategies for Improving Quality of Education in Nigeria through the Use of Community Informatics Social E-Learning Network

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Abstract

Over the last few decades, the quality of education in Nigeria has declined leading to unacceptable low academic performance, high level of functional illiteracy, growing population of unemployable graduates. This paper presents Community Informatics Social E-learning Network (CISEN) strategies that use community-based approach to identify and address the challenges facing education in the various communities across Nigeria. The CISEN uses an online GeoHubNet Community Structure (GCS) to organize the geo-communities in the various states of Nigeria. The CISEN strategies focus on bringing together the stakeholders in each local community to create awareness, identify issues pertaining to education, develop appropriate educational program that will address the issues raised and improve the quality of education in the local communities. Furthermore, the CISEN provides a framework for evaluation of the academic performance of the pupils and students on a continuous basis. CISEN also has mechanism for impact assessment of the CISEN strategies on the quality of education in those local communities it supports.

Keywords: Community Informatics; GeoHubNet, Education; Functional Illiteracy; Community Hub; Learning Process; Quality of Education

1. Introduction

Over the last few decades, the quality of education in Nigeria has continued to decline leading to growing population of unemployable graduates and increasing incidence of functional illiteracy across the nation.

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Several attempts have been made to address the situation but the success recorded so far is insignificant compared to the level of decadence in the quality of education in the same period. Basically quality education encompasses people who are healthy, well-nourished and ready to participate and learn, supported in learning by their families and communities, environments which are conducive for learning, contents which reflects the correct/upgraded curricula and materials and processes to evaluate and enhance teaching performance. Given that different communities face different forms of challenges with respect to various aspect of quality education, it requires an innovative community-based approach to tackle the problem. In this paper, strategies for improving the quality of education in Nigeria through the use of Community Informatics Social E-learning Network (CISEN) are presented.

According to Gurstien [12], Community informatics (CI) is the study and application of ICTs to enable community processes such as community development. CI for education includes improvement in quality of through ICT-enabled community collective process. Similarly, social e-learning is incorporating social networking features into an E-learning Network such that the social network tools can be used to enhance teaching and learning processes. CISEN is a facilitator-coordinated community-based social E-learning Network that uses an online GeoHubNet Community Structure (GCS) to organize the geo-communities in the various states in Nigeria. The GCS enables the facilitator to build and manage active community learning networks and functional community education hub for each local community across the nation.

The community education hub provides room for facilitated community volunteered information system. Through this mechanism, the challenges and needs of the community in respect to education are identified and made visible and accessible on the online community education hub. At the same time, the CISEN makes room for corporate social responsibility intervention, government intervention and other sponsors and volunteered resources and services that are targeting at addressing those identified challenges and needs of the community. In addition, impact assessment mechanism is also built into the system for regular evaluation and reporting of the impact of the system on quality of education in the communities it supports.

Finally, this paper is arranged into sections; section two presents a review of relevant literature, the methodology used is presented in section three along with the GeoHubNet Community Structure. Section four outlines the strategies for achieving the objectives of the CISEN in the community. Lastly in section five, conclusion and recommendation for further research are presented.

2. Introduction

2.1. Education and Indices Of Quality Education

Education, according to English dictionary is “the process of acquiring knowledge and the theory of teaching and learning”. In addition, education can be said to be “learning which is training and bringing up” [13]. Okafor [6] views education as a process of acculturation through which the individual is helped to develop and maximize his potentials and to use them when necessary, for the right reason and to be self-fulfilled. In this wise, quality of education can be said to be declining if it lacks the much desired outcomes. Bamisaiye [4] highlighted productivity of the educational system and the factors-inputs as the indices for measuring quality education. Productivity can be described as a ratio of inputs to outputs variables both in terms of quality and quantity.

Human and non-human inputs can be used in an educational system to produce desired output after going through a teaching and learning process. When such inputs are periodically measured in relation to the desired outputs using various techniques, the result obtained would be referred to as the productivity of the system. Factors-inputs indices include the following, Bamisaiye [4]:

- quantity and quality of inputs to education
- relevant curriculum
- appropriate teaching methods and the quality of teaching aids
- adequate and suitable infrastructural facilities
- students-teacher ratios and students-classroom ratios
- planning, administration and efficiency of inspection and supervision
- availability of suitable textbooks, well equipped library and resource centers for teachers and students
- the proportion of the trained men and women in the teaching force
- continuous assessment of learning activities and experiences
- reliability of examinations in use

- the quality of learning that is achieved
- parents' positive or negative attitudes to education
- cultural and religious views in the local community
- and the living levels of children's families, their health and nutrition.

Longe [16] pointed out that quality education involves measuring outputs from the education system and secondly examining the educational processes which produce these outputs. Quality of education can be determined from the input side such as students' capacity and motivation to learn and the curriculum or the subjects to be learned. Babalola [7]. In addition, the effective performance of the outputs in the competitive labour market, their impact on moral conduct and serviceability in the society are also indicators for measuring the quality of education. The feedback from the labour market and society generally is important to the education system for evaluation of both the educational processes and outputs.

In Nigeria, one useful index for measuring the quality of education is based on the measurement of students' performance overtime. This suggests that the success of any educational system or policy can be determined by the performances of the learners over a stipulated period of time. This idea can be called summative evaluation where evaluation is conducted at the end of a long period of study, which is cumulative, comprehensive, valid and reliable. Hopkins [2]. Accordingly, the major indices used in the Nigerian context are usually the results of examinations organized by examination bodies such as the West African Examinations Council (WAEC) and the National Examinations Council (NECO) which conduct certification examinations for Senior Secondary School students. Also, the functional literacy of graduates is an index for measuring quality of education in higher institutions. With the evaluation of the results publish over a period and adequate comparisons, the quality can be measured to determine the extent of decline. Furthermore, the ability of graduates of university to have the requisite industrial skills and technical "know-how" when employed is also an index to measure quality education.

2.2. Challenges of Education in Nigeria

The challenges in achieving quality education in Nigeria are numerous. According to Abodomu [5], many of the schools, most especially the public institutions lack infrastructures, books and other instructional materials. Onyike [14] noted that education in Nigeria has problem of shortage of teaching aids and unmotivated teachers. Ochuba [19] blames inspectors of schools for poor standards of education. The standard of education was continually declining due to low quality of supervision and inspection. Majidadi [8] explained that the total absence of the application of instructional material or poor use of it in teaching English language has a negative impact on learners. Lance [9] demonstrated that inadequate materials in school's libraries lowered the grades of students' performances whereas schools that have adequate materials have improved performance in their grades.

However, absence of instructional materials (language laboratory, audio – visual aid) leads to lower students' academic performance in teaching language subjects. Alaezi [15]. Also, Orkaa [3] stressed that these challenges are because students are refusing to subject themselves to studying. He said "they rather use fraudulent means and engage in examination malpractices, instead of studying. In 1976, Nigeria launched the Universal Primary Education (UPE). Regrettably, the program failed due to lack of funds. In 1999, Nigeria again launched the Universal Basic Education (UBE). The greatest challenge to UBE is the underfunding of the educational section which is still far below the standard set by the United Nations Educational, Scientific and Cultural Organization (UNESCO). UNESCO stipulates a minimum of 26% of national budget.

2.3. Community Informatics and Social Network

Keeble and Loader [11] describe Community Informatics as a "multidisciplinary field for the investigation and development of the social and cultural factors shaping the development and diffusion of new ICTs and its effects upon community development, regeneration and sustainability." Community Informatics in the area of education can be used in providing communities (villages, small towns, settlements and hamlets) with the means (manpower, skills, resources, funding) to address community-defined challenges as it relates to education.

Research findings indicate that social networks allow for interconnection and interaction of large number of people and communities, encourage collaboration and discussion of learning materials, and promote immediate sharing and development of text, audio, and visual contents (Rosen [10]). According to Mayfield [1] social network is characterized by user participation, openness, conversation, community, and connectedness. Social network serve as

a platform to interact, share information, resources and ideas using social networking tools such as chat, messaging, video, email and discussion groups.

2.4. Social E-Learning

E-learning is teaching and learning that are delivered, supported, and enhanced through the use of digital technologies and social media to disseminate knowledge to enhance the traditional face-to-face teaching and learning methods. Also, Social E-Learning can be defined as incorporating e-learning into a social network such that the tools available in the social network for interactivity and interconnectivity can be used to enhance teaching and learning processes.

3. Research Methodology

The work entailed in this paper is development of strategies for improving quality of education in Nigeria through the use of Community Informatics Social E-Learning Network (CISEN). The strategies were developed along with the social e-learning network software that supports it. However, this paper focuses on the strategies. In any case, User Centered Engineering (UCE) method called Participatory or Community-Centered Engineering (P-CCE) was used to develop the strategies with respect to the CISEN. The P-CCE approach is both participatory and evolutionary. During the requirement engineering process, user and system requirements were acquired using interviews, questionnaires and low fidelity prototypes. The bulk of the requirements obtained were from local community groups, schools and supervisors of education process and institutions in selected communities across the country. Thereafter, a requirement specification document was produced and then used to engage the stakeholders in the community for feedbacks which were used to modify the requirements until it meets the community expectations. The same approach was used to develop and evaluate the CISEN-based strategies for improving the quality of education in each of the local communities involved in the system development.

3.1. The Online Community Structure For The CISEN

The paper adopted the online GeoHubNet community structure (Fig.1) developed in [17]. The GeoHubNet is used to organize the online communities according to certain existing geopolitical divisions such as nationwide, statewide, regional or citywide geo-communities. Fig. 3.1 shows a statewide GeoHubNet structure. Inside the statewide GeoHubNet structure are regional geo-communities representing citywide, senatorial or local government geo-communities. Within each regional local community are local groups, institutions and individuals who are members of that online community. Each regional geo-community has a set of facilitators and possibly along with co-facilitators that moderate the interconnection and interaction of the members in that regional community. The facilitators also conduct the regional community network weaving. The collection of all the regional community facilitators in a state make up another network called the HubNet. The HubNet in this case are actually the local community organization that champions the community improvement program. In other words, the HubNet is the facilitator organization for the CISEN.

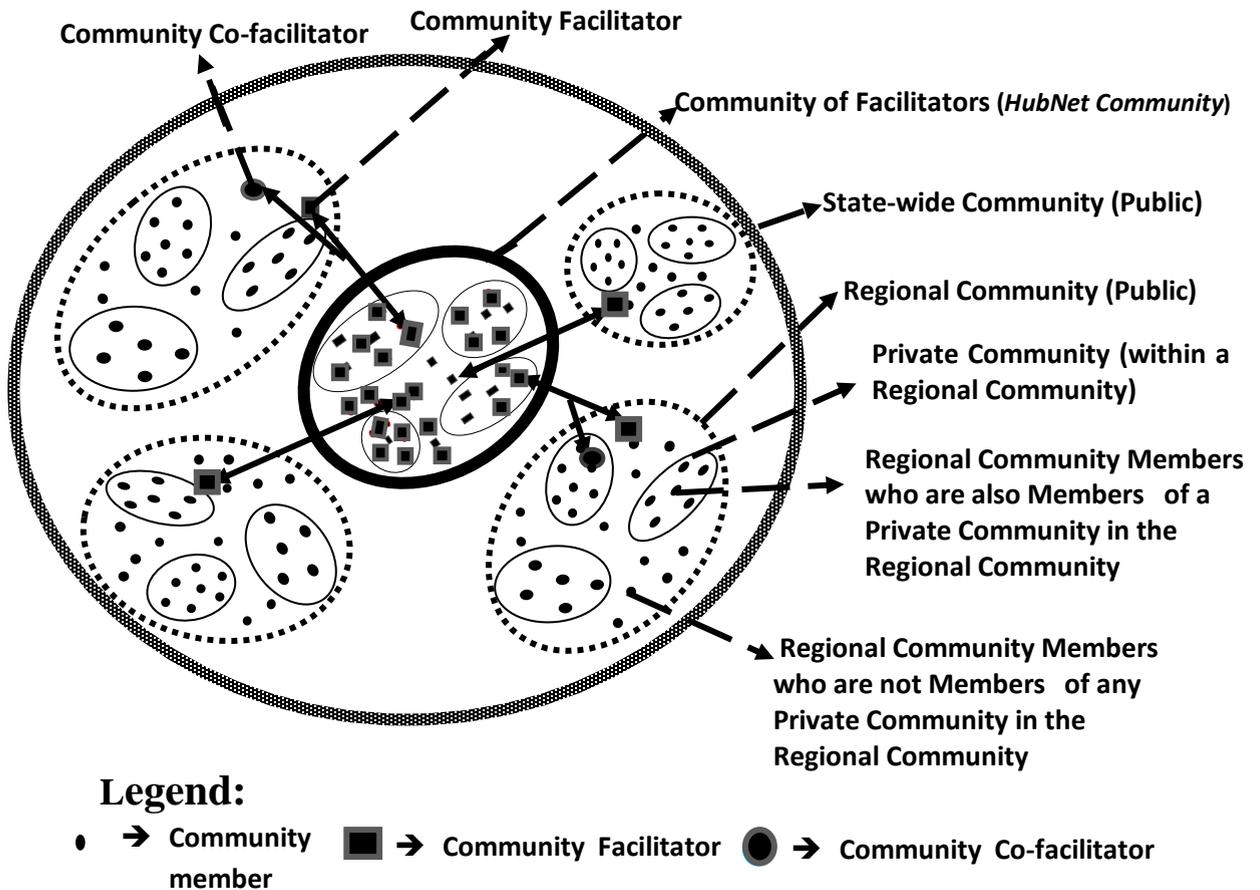


Fig. 1. Statewide GeoHubNet Community Structure

3.2. The CISEN Online Community Hub

In order to ensure active participation of local community members and other educational stakeholders in improving the quality of education in selected communities in Nigeria, the CISEN provides online education hub for each of the local communities it supports. The components of the online community hub are shown in Fig. 2.

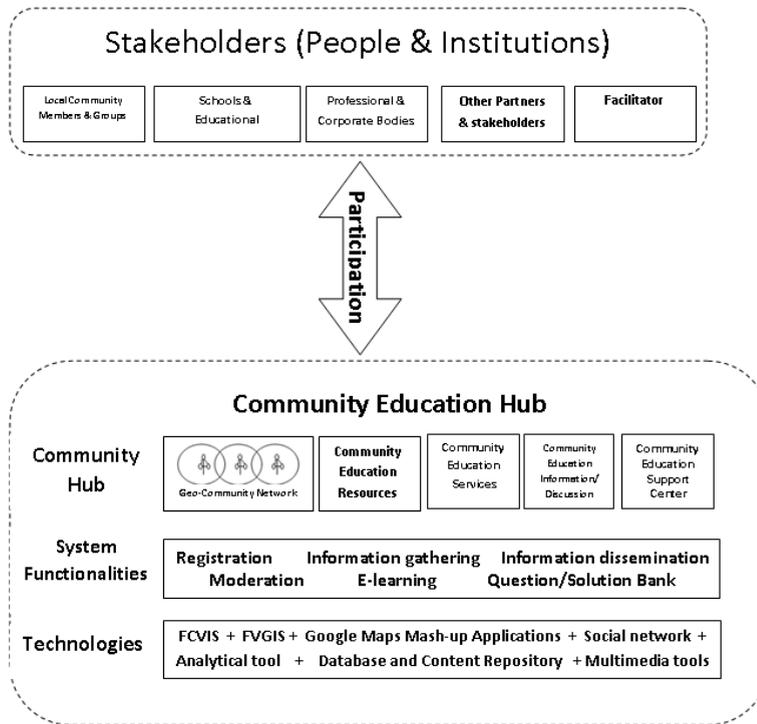
3.2.1 The Community Hub Structure:

With respect to the online GCS, online geo-community is created for each local community in the various states in Nigeria. Then, the facilitator builds online community education hub on each of the online geo-community it has created for each of the local community it supports.

3.2.2 The Community Hub Components and Functionalities:

The online community education hub is basically a one spot or virtual space on the internet where the scholarships, facilities, schools, opportunities, local groups, local information and discussions, etc. that are relevant for improving the quality of education in each local community are made visible and accessible. The community education hub also makes provision for a Volunteer Management System (VMS), strategic community network weaving and Facilitated Community Volunteer Information System (FCVIS). In addition, the system uses Google Maps mash-up applications to support Facilitated Volunteer Geographic Information (FVGI) for mapping community education resources. The Facilitated Community Volunteer Information System (FCVIS) and the Facilitated Volunteer Geographic Information (FVGI) with Google Maps mash-up applications enable facilitated user-generated information; educational resource mapping; social validation of contents and issues; request for community support; request for sponsorship intervention and opportunity for volunteering resources and services.

The Volunteer Management System (VMS) enable community members, groups and institutions to volunteer resources, services etc. targeted at improving the quality of education in the community. The VMS enables the facilitator to coordinate the volunteers, volunteered items, as well as the beneficiaries of those volunteered resource and services. In addition, the CISEN has robust e-learning features which allow community access to downloadable materials in various formats. Social networking tools are also incorporated in the CISEN to allow for teaching and learning management; registration and management of online community members, etc.



LEGEND:
 FCVIS: Facilitated Community Volunteer Information System
 FVGIS: Facilitated Community Geographic Information System

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Figure 2. Model for the CISEN Geo-community Education Hub

This section]

the CISEN.

4.1. Building Active Community Education Network

It was discovered from the feasibility study and requirement elicitation and analysis conducted in selected communities across the nation that most of the problems regarding education are seen as individual problems or

addressed from individual perspectives rather than employing community approach. The reason been that in respect of educational matters there exist weak and inactive community networks in all the communities studied. For instance, it was discovered that wealthy parents withdraw their wards from public schools where poor educational facilities and learning processes are having growing negative impact on the pupils and students. These well-to-do parents enroll their wards in private schools, organize private home tutors and acquire requisite learning materials for their wards. However, the population of such wealthy parents is so small compared with the overall community population. Furthermore, these students from wealthy family in most cases do not concentrate and take advantage of these learning opportunities provided by their parents. Video games, peer group influence and other non-curricular engagements impact negatively on the academic performance of these students irrespective of the educational resources available to them. In essence, the rich also have some deficiencies that require community effort to address.

Consequently, the first strategy towards addressing the challenges to quality education in Nigeria is the development of strong and active education network in every local community in Nigeria. This is because every community consists of networks which can be active or passive. Passive networks are networks where the individuals or groups mind their own business and are not eager to explore and exploit the inter-dependencies that exist between them and other groups. In this paper, inter-dependence between two groups A and B means that there are things that group A would benefit from group B if they connect and interact; likewise, there are also things group B would benefit from group A through the same interconnection and interaction. Active networks on the other hand, are those networks where individuals and groups strive to identify relevant groups and institution they can connect with and then take advantage of the inter-dependencies that exist between them and those groups and institution.

Experts believed that a strong community is a community with active networks. However, experts have noted that active participation of people in collective processes like active networks do not just happen; it requires a facilitator with requisite tools and strategies. Consequently, in this paper, strategic community network weaving is employed as prerequisite for community-based approach for addressing the problems of poor quality education in the country. In view of the demand for active community network weaving, the CISEN facilitator uses the online social network to capture relevant information of various local community groups and institutions and their network affiliations. Furthermore, the facilitators work with the community groups and institutions to identify and harness the various inter-dependencies that exist among them in the community. For instance, the facilitator can use industrial skill acquisition scheme for undergraduates to build active social e-learning network. The scheme works as follows;

“The CISEN enables the various student associations to register their presence on the online platform indicating the various industrial skills and technical “know-how” training they need and of which they need community support. The various professional bodies and organizations are also enabled to view the submissions and then use their expertise to review and augment the information submitted by the students to make it more relevant to their industry. Equally the system makes provision for volunteers to provide facilities and expertise to render this training. Corporate bodies’ sponsorship, government interventions and other sources of sponsorship can be sourced by the facilitator organization to fund the program. Through this means, the sponsors can advertise or publicize their products, services and programs. This will improve their corporate social image in these local communities while the students benefit in terms of skills acquired in the training program and access to training facilities. Professional bodies gain by having improved student membership through collaboration with the facilitator. In all, there will be more graduates with requisite skills for employment or those that are skilled enough to establish their own business ventures”.

4.2. Identify Community Educational Challenges through FCVIS

The CISEN has a mechanism for facilitated community volunteer information system (FCVIS) which provides an avenue for members of the community to post and comment on issues affecting the quality of education in their community. These contents can be visible and accessible in the online community hub for that community. The contents posted will be categorized by the CISEN based on the categorization terms supplied by the content provider and the online community facilitator. For instance, challenges such as lack of facilities, absence of teaching and learning materials are categorized as “Education facilities”, while sponsorship and scholarships can be classified as “Education Opportunities” in the CISEN.

Furthermore, the facilitator moderates the contents posted by the community members from the community discussion to determine the social and educational relevance as it relates to the community. Equally, of the other functionalities provided in the system includes:

- moderation mechanism for teaching and learning contents uploaded to the online community hub;
- moderation mechanism for question and solution banks;
- social validation of contents to make it easier for users to locate very useful educational materials that are uploaded to the online community hub;
- development of standard national and international curriculum in collaboration with stakeholders in the educational sector such as UNESCO and Nigerian Union of Teachers (NUT), State Universal Basic Education Board (SUBEB), Universal Basic Education (UBE), etc.

4.3. Sponsorship, Volunteer and Community Support Facilities For The CISEN

In the CISEN, the facilitator plays important role in facilitating active participation of the local communities and other stakeholders. The facilitation may involve sensitization programs, educational workshops, seminar, round-table discussions and conferences, debates, etc. In addition, the facilitation may equally involve provision of basic educational materials for teaching and learning such as classrooms and training facilities. In essence, the facilitation work requires funding of which the facilitator might pursue through volunteer resources and services, corporate sponsorship and government interventions. Accordingly, the CISEN has a mechanism to request for sponsorship and community support as well for volunteering resources and services. In addition, the CISEN provides mechanism for community members, groups and institutions to post the educational resources and services for which they require community support or external intervention. For instance, Mobile Telecommunication Network (MTN) is known to provide ICT laboratories to selected schools around Nigeria to improve the technological skills among pupils in that community. A community in a particular geographic location without ICT centers can present this challenge using the CISEN education hub platform. In turn, the community facilitator will draw the attention of MTN for sponsorship of the building of an ICT Laboratory based on the community support request posted on the CISEN education hub. In response, MTN can as part of its corporate social responsibility build, operate and transfer the ICT lab to the host community. In the process, MTN would be able to advertise all its products and services, generate revenue from the sales in that community and improve their corporate social image. The community benefits in having an ICT laboratory that would serve as a facility for learning, computer training and internet connectivity. Members of the community can take advantage of this opportunity to become ICT literate.

4.4. Evaluation Of Academic Performance In Communities

The CISEN provides mechanism for evaluating the impact of the program on the quality of education in each of the local community it supports. For instance, the system has some online quizzing system for primary and secondary schools students; competence level assessment on relevant professional/industrial tools like MATHLAB and AUTOCAD for engineering students. Furthermore, the CISEN provide mechanism for parents and guidance feedback on the performance of their wards; teachers and school administration feedback on the performance of their students; and personal performance evaluation and assessment. Through these program impact assessment and reporting mechanisms the social impact assessment of the CISEN will be conducted and reported continually by the facilitator organization, by the users and also by the independent evaluators.

5. Conclusion and Recommendation

5.1. Conclusion

This paper presented CISEN-based strategies for improving the quality of education in various local communities across Nigeria. The strategies was developed using a Participatory or Community Centered Engineering (P-CCE) approach. The first and most important strategy outline is the building of active community education networks in the various online communities. Other strategies presented include identification of community challenges in respect of education, sponsorship, volunteer services and community support. An online community architecture called GeoHubNet was also employed to guide the facilitator in creating and managing the online community and there corresponding community education hub. Furthermore, the paper outlined the need for continuous evaluation of the system to demonstrate the its impact on the quality of education in each of the local communities it supports.

5.2. Recommendation

Further work is need to be done in the area of CISEN technology diffusion in the various local communities across Nigeria. Furthermore, the success of the scheme depends largely on the ability of the facilitator to effectively use the tools and strategies. As such, there is the need for a cross functional team of community development experts and social e-learning experts to serve in the CISEN facilitator organization.

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