STRATEGIES FOR IMPROVING QUALITY OF EDUCATION ADMINISTRATION DATA FOR INFORMED RESEARCH AND POLICY DECISIONS

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ABSTRACT

The Education Management Information System (EMIS) in Ghana works in tandem with priority areas of the Plan of Action of the Africa Union’s Second Decade of Education for Africa and the UNESCO Institute of Statistics. Collectively, they seek to establish robust and reliable education statistics production systems capable of effectively supporting education policy planning and development. EMIS-Ghana provides one of the key education statistics within the African sub-region. This paper examined and analysed the immense role that annual school census plays in education planning at both national and international levels and the attendant issues that challenge a more efficient data management system. It also sought to confirm that the introduction of a student identification system in annual census exercises will greatly improve data coverage and use. The findings reveal that reliance on demographic and health surveys conducted every 4 or 5 years that produce statistics especially on out-of-school children and only at regional levels can be overcome through the use of pupil-student identification system for tracking pupils as presented in this paper. This important revelation showed that tracking of pupils along the education system will not only help to estimate annually district-level numbers of out-of-school children for better planning, but can also provide useful administrative data for varied tracer studies on impact of varied sector interventions and programmes for informed policy decisions.

Keywords: Unique Pupil Number, Administrative Data

1. Introduction

The last two decades have witnessed an extraordinary increase in the demand for official statistical for policy decisions and especially education data (Ministry of Education, 2015). This increase comes about as a result of the use of an “evidence-based policymaking” approach to decision making in development-related initiatives. The demand for better and improved statistics is not only being championed by statisticians, but at the highest political levels, as well as businesses, organizations, Non-Governmental Organisations and individual citizens. There is, for example the need to monitor the implementation and evaluate the achievements of a number social intervention programmes of government to help inform policymakers on the way forward. Additionally, there are many other national programmes in the field of health, social protection, and nutrition, which also require administrative data to monitor and evaluate their effectiveness. Some of the areas for which statistics are urgently required include: employment and unemployment, enrollment of students in primary, secondary and tertiary institutions.

A significant component of the new demand for statistics is from the renewed emphasis the Government of Ghana has placed on better planning for development outcomes (Ministry of Education, 2015). Building on the experience from two cycles of poverty reduction strategies, the current initiative of Ghana’s National Development Planning Commission (NDPC) towards the...
development and adoption of a long-term development plan calls for establishment of protocols for improving administrative data for informing policy decisions. The up-scale planning effort from the national to the decentralized levels of government administration requires a coordinated system of statistical production and dissemination, which has hitherto not been available.

In an effort to make adequate and reliable data available for scientific policy formulation, planning and implementation of various programmes and projects in education in Ghana, the Ministry of Education launched the Education Management Information System (EMIS) Project in January, 1997 with technical support during the first and second Phases from the Harvard University and funds from the World Bank and the Government of Ghana. As an integral part of the Free, Compulsory and Universal Basic Education (FCUBE) Programme, the EMIS Project was planned to build on the already existing EMIS established in 1988 in the Ministry as part of the Education Reforms (Ministry of Education, 2015). A Peer Review Exercise\(^1\) of Ghana’s EMIS reported that Ghana’s Education Management Information Systems (EMIS) complies, to a large extent, with the ECOWAS EMIS Norms and Standards and can be deemed to produce “Acceptable Education Statistics (ECOWAS, 2015).”

2. Research Objective

The objectives of this paper include:

- To discuss the current structures and protocols that impede a more efficient annual school census and data collection exercise?
- To ascertain how education administrative data collected every year can be improved to give a better prediction of the annual enrolment in the schools and for estimating numbers of out of school children.
- Analyze the dynamics of introducing a Unique Pupil Number (UPN) for enhancing annual education census and ensuring a more reliable and qualitative education statistics for estimating annualized numbers of out-of-school children.
- Discuss and recommend new and improved administrative structures vital for ensuring a more efficient annual school census exercise and improve evidence for both policy decisions and supporting rigorous research.

3. Statement of the Problem

Annual school census is organized with the primary objective of updating the enrolment and facilities parameters to provide stakeholders with adequate and timely information for policy decisions and further research. The 2015 annual school census marked the 27\(^{th}\) round of exercise in Ghana EMIS, (2015) and compared the actual results with that of the previous exercise, thus the 26\(^{th}\) round of school census of the Ministry of Education, EMIS, (2014). Similarly, the 26\(^{th}\) round of school census compared the results with that of the 25\(^{th}\) round of school census, EMIS, (2013)\(^2\). Therefore, the unknown and exact number of total registered schools especially basic schools, makes it difficult to ascertain coverage of annual school census and be able to determine to a large extent the actual numbers of persons of school age that are in school. Hence the annual school censuses report the

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1 The ECOWAS Commission and the ECOWAS Ministers of Education endorsed a the framework of 17 minimum Norms and Standards covering policy and legal frameworks, resource availability and utilization, statistical processes and information dissemination strategies, with the objective setting criteria and measurements for country benchmarking and advocacy for improved practices to produce quality education statistics and information in terms of relevance, accuracy, comprehensiveness and timeliness.

statistics as it is, and cannot support empirical reference to determine how many private schools are not captured to allow for an adjustment or extrapolation. Coupled with the ever-growing trends in private school participation (Ministry of Education 2015 and 2014), weak census response rates from private providers of education and particularly true of post-secondary non-tertiary and tertiary institutions (ECOWAS, 2015) and the unwillingness of some private schools to report (Mehta, 2012), it can be inferred that there may be more pupils of school going age in Ghanaian schools than what is reported. By introduction of a Unique Pupil Number (UPN) and legislations and structures for administrative data collation, storage and retrieval, Ghana’s education data quality can improve tremendously and enhance the quality of policy decisions and support for further research. It is in the light of these, that the Ministry of Education and the entire sector need to focus on improving accuracy, reliability and comprehensive coverage of data, particularly in the private sector.

4. Literature Review

4.1 Introduction

The Education Management Information System (EMIS) in Ghana works in tandem with priority areas of the African Union’s Second Decade of Education for Africa Plan of Action and the UNESCO Institute of Statistics that seek to establish robust and reliable education statistics production systems capable of effectively supporting education policy planning and development. EMIS-Ghana provides one of the timeous education statistics within the Africa sub-region (Ministry of Education, 2015). Administrative data describes information which arises via the operation of a transaction, registration or as a record of service delivery (Figlio, Karbownik, Salvanes; 2015), and such data relates specifically to the administration of a system or process and are not primarily generated as resources for the purpose of research (Jones and Elias, 2006). Administrative data have significant potential as research resources, either in their own right or via linkage to other sources of information, e.g. censuses or surveys, (Figlio, et al., 2015). Administrative data as recognized in a series of recent reports have also raised a number of important issues relating to the need to preserve their confidentiality, concerns about the privacy of individuals and the legality of sharing such information between government departments and agencies.

Education administrative data refers to school level day-to-day information collected primarily for school records, and to support school level decisions. Hence, school or education administrative data is collected by mandated government institutions working in the field of education.

Additionally, school level data collected periodically and analyzed for decision making provide stakeholders with adequate information on performance of the school, teachers and pupils/students. In the light of this, the importance of administrative data for enhanced policy decisions and research cannot be over emphasized considering the direction the world is heading especially in the wake of the 21st century, where evidence “must speak”.

3 This has been noted as common phenomenon among developing countries where systems for data collation and protection is a very big challenge.

4.2 “Administrative” versus “Purpose-built Survey” data

Administrative datasets allow for the possibility of making twin comparisons or study a number of related variables and to investigate the effects on specific socio-economic events (Card, Chetty, Feldstein, Saez, 2010; Roed & Raam, 2003). Thus, the use of education administrative data will invariably allow the study of series of interventions that are implemented for the purpose of achieving certain outcomes. Administrative data sets also provide novel types of variables typically not found in non-administrative data (Einav & Levin, 2013).

Einav and Levin, (2013) noted that “attribute” of administrative data at providing real-time information provides new opportunities to study the effects of educational policies and practices that are very recent; and offers the chance for researchers to make their scholarship much more relevant to the specific policy decisions. Another benefit of administrative data is that data quality is likely to be simply better than retrospective data collection. Instead of asking participants in a survey whether they were beneficiaries of a given programme ten or twenty years ago, administrative data assists scholars to observe directly whether the individuals participated. Additionally, because of the mandatory nature of participation in the activities that generate administrative data, these data are much less likely to suffer from attrition problems or non-response problems than are data collected through voluntary means (Card et al., 2010).

While some research is transferrable and we can learn a lot from work done in other countries, other research is best conducted locally, suggesting a benefit to many developing countries, maintaining, and sharing with researchers their administrative data (Card et al., 2010). Administrative data are more comprehensive than are purpose-built survey data, and can be collected with frequently far more accurate information. Furthermore, the costs of conducting research with administrative data are much lower as well, at least once the data systems are developed.

Administrative data, presumably, seek to complement field experiments, as the costs of tracking and following up with field experiment participants are much lower, and the data frequently much better, when the field experiments can be linked with data collected by governments for administrative purposes (Card et al., 2010).

4.3 Coverage of Annual school Census

Improving the data coverage during the annual school census is important for improving the efficacy of education administrative data. ECOWAS (2015) noted that at some instances, there is the occurrence of inadequate data coverage of all educational institutions (both public and private) and all sub-sectors within Ghana’s education system. Mehta, (2012) noted that not all private basic and senior high schools are covered in the annual school census. ECOWAS (2015) noted the structural arrangements for the management of education is characterized by the absence of a policy and Norms and Standards for the management of education information. Some countries have more than one ministry responsible for education and training. Consequently, each Ministry collects its own data and information. Education delivery in Ghana lies not only with the Ministry of Education, but other sector Ministries have a number of educational institutions under their jurisdiction. For instance, the Agricultural colleges, and school of horticulture are under the Ministry for Food and Agriculture; the Ministry for Employment and Labour Relations, Ministry of Health and others. likewise have a number of vocational training institutions and nursing colleges respectively under their management. The absence of a national established repository of registered educational institutions subject to periodic updates makes the annual school census results for a particular year only comparable with the results of the previous year. For instance, the 2015 annual school census which marked the 27th round
of school census in Ghana (Ministry of Education, 2015) with the primary objective of updating the enrolment and facilities parameters to provide stakeholders with adequate information for policy decisions and further research could only be compared with the results of the 26th round of school census.

Mehta (2012) observed that District Education Offices do not own public schools as much as they own private schools5. This said, has a high probability of affecting the response rate of private schools in the annual school census. Article 25(2) of the 1992 constitution of the republic of Ghana stipulates, “Every person shall have the right, at his own expense, to establish and maintain private school or schools at all levels and of such categories and in accordance with conditions as may be provided by law”. The steps taken by the Ministry of Education in the drafting of the Private Schools Regulation Bill,6 until now was unable to materialize into approval and implementation. Thus in the framework of the constitution and until such a time that other laws are brought into force for the regulation of all schools including private schools, which of course stipulates that schools are under obligation and required by law to submit school level administrative data to District Education Offices. Mehta (2012) recommended that the Director General of the Ghana Education Service to circulate official letters to all private school managers at the basic and senior high level to participate actively in the annual school census, and the Statistics Research and Information Management (SRIM) Division to produce annual summary statistics known as EMIS flash Statistics to increase awareness on annual school census; the absence of a legislative instrument on school level data collection and collation for policy decisions will to a large extent make school census optional rather than a requirement by law for school managers and head teachers. The draft new education bill which seeks to ratify the Ghana Education Service Act 506. The Education Act 778 entrusts the National Inspectorate Authority (NIA) which used to be called National Inspectorate Board (NIB) under the Education Act, Act 778 with the responsibility of setting “standards in public and private schools to ensure their improvement and to enforce standards in these schools to ensure quality education. The governing body of the Inspectorate Authority is to establish inspection panels to provide an independent external evaluation of the quality and standards in pre-secondary and secondary education institutions, clause 227.”

The use of data in educational planning remains an elusive concept and skill, yet the path to using data in making decisions is not out of reach or difficult to implement (Bernhardt, 1998). This is evident in the dispensation of massive explosion of use of information communication technology. Governments heavily invest in education but spend little to monitor and evaluate the investments made. Schools on the other hand make little effort to monitor and evaluate their activities and thus, they can no longer operate with minimum data about their environment if they are to closely monitor the inputs, process, and output in the interest of institutional development and survival (UNESCO, 2010). In this technological age, the explosion of digital dispensation provides a leverage pursue powerful and systematic change strategies and new capacities towards development of systematic and strategic use of data to support student success and continuous school improvement (Holcomb, 1999). Bernhardt (1998) made an impassioned case for using data as a lever for creating more effective schools for students and emphasized that “what separates successful schools from those that will not be successful in school reforms is the use of one, often neglected, essential element—”data”. Despite the knowledge of how useful data is for effective planning and decision making, schools in developing countries and

in particular Africa have historically lagged behind non-educational organizations in implementation and utilization of Management Information Systems (Telem, 1996).

Figlio, Karbownik, Salvanes; (2015) observed that governments have established statistical Departments and mandated them to manage and use administrative data to produce official statistics about their populations. Similarly, the education sectors have benefitted from huge governments investments to develop longitudinal data systems. Figlio, et al, 2015, noted that in the United States, the federal Department of Education has invested over $750 million to help states build, populate, and maintain these data systems. Much of this innovation in the United States came about as part of school accountability systems, and accountability systems still provide the backbone for the country’s most frequently used databases.

5. Design/Methodology/Approach
This paper makes use of secondary data and reports through review of desktop information and records of annual census reports from the Ministry of Education. It also involves review of international literature on what has worked in other parts of the world. The paper concludes with a synthesis of what has worked.

6. Find Analysis and Discussions
6.1 The Census Processes Explained:
The current systems of annual school census show that the annual cycle of census begins with an orientation programme for all Regional /District Officers in charge of Statistics including Circuit Supervisors8 from the 216 Districts, and the 10 Regional Statistics Officers. After the training, the Circuit Supervisors/District Officers then organize briefing sessions with heads of schools. During the briefing sessions, all head teachers are encouraged to bring along all their records and begin to fill in the questionnaire using their source documents. It is at this point that head teachers/proprietors of private schools are invited to do same. Circuit Supervisors have to vet and endorse each completed school census questionnaire which are also counter signed by the District Statistics/EMIS Officer before data is entered into the software for collation and analysis. Response to census questionnaire by schools are sometimes slow, especially private schools (ECOWAS, 2015) and Mehta, (2012) observed that District Education Officers do not own private schools as much as they own public schools, tend to affect the response rate for each annual census. Thus private schools do not feel answerable to District Education Office especially in the areas of compliance to annual school census activity. Without a sense of list of registered school in a repository or identified database that is updated every year, there exists no means of checking and determining the coverage rate.

The current school questionnaire elicit responses only on school characteristics without attention to pupil level data. Thus this paper brings into focus the introduction and use of a Unique Pupil Number (UPN) similar to what is being used in other developed countries such as England. However, this UPN comes along with peculiar features purposely designed to suit the climate and situational context of the environment of education delivery in Ghana and seeks to provide solutions for addressing the issue of estimating out of school children numbers for supporting policy decisions on an annual basis moving away from the expensive nature of surveys that are organized every 4-5 years like the case of Ghana. The UPN is born out of the educational issues in Ghana that has continued.

However, with the introduction and application of UPN backed by required legislation, all public and private schools will ensure that they are duly registered before beginning admission of pupils. This

8 Circuit Supervisors are responsible for a maximum of 15 schools within a catchment area.
allows the Ministry of Education working through its mandated Agency (NIA) to have an updated list of schools before the commencement of any academic year. This UPN application will augment the current census processes and assist in giving attention to the tracking of pupils as they go through the various levels of education. Ghana can improve its school census coverage and be able to know the number of schools at any academic year.

6.2 Augmenting the school characteristics with pupil characteristics, the Unique Pupil Number

6.2.1 What is a unique pupil number?
The Unique Pupil Number (UPN) proposed in this paper is expected to be used in identifying each pupil attending a registered public or private educational institution in Ghana. The UPN shall be allocated on first entry to a school and is generated using a nationally specified formula expected to remain with a pupil throughout their period of schooling regardless of any change in school or Metropolitan, Municipal or District Authority of jurisdiction.

6.2.2 When are UPNs allocated?
UPNs shall be allocated at the point of a pupil’s first entry into a registered educational institution in Ghana. This is usually when a pupil joins a pre-school or primary school (including kindergarten), but can be another date if entry to the registered school is not the usual early childhood entry point. This also holds for foreign students who apply to study at any tertiary institution in the country.

6.2.3 What is the purpose of the UPN system?
The UPN is expected to facilitate the transfer of attainment data through the registered school system in Ghana. This system is expected to (i) assist in the development and maintenance of a national repository of registered educational institutions, (ii) a databank of pupils issued with a UPN as required by Law, (iii) assist in the determination of the date-of-birth of a pupil during admission. This situation will help overcome the unwillingness of some schools to participate in the annual national school census, Mehta (2012); and also address the situation where private schools remain undercover for close to ten years until their first batch of pupils reach Junior High School final grade and have to register for the Basic Education Certificate Examination (BECE). The UPN shall help in the determination of annual numbers of children with specific ages and more importantly assist in tracking the exact statutory ages of basic education thereby helping to ascertain annually the changes in the numbers of out-of-school children for informing decisions on specific and timely strategies. The UPN as the name implies is expected to be used only within the educational institutions and solely for the purpose of improving access to student datasets for enhanced education resource planning and administration. The UPN usage ends when the bearer completes a tertiary education programme(s) and not be used for public or social identification. Thus the UPN is not for public consumption and shall be kept in accordance with the data protection Act of 2012. The features of the UPN is designed for tracking pupils and assist in ascertaining the internal efficiencies of the education system, helping policy makers to define the returns to every Ghana cedi invested in a particular academic year. The UPN shall not be used for public identification and expected to be used purposely for school and academic records.

The West African Examinations Council requires all schools to seek to register their candidates for the end of basic school examination to have a school code issued by the Ghana Education Service. This also explains the weaknesses in the existing protocols for registration and supervision of schools.

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9 The paper proposes that there shall be in existence legislations to ensure that all educational institutions are not only registered by law, but under obligation to work with the Metropolitan, Municipal and District Authorities with Jurisdiction and the National Inspectorate Authority for the issuance of UPN.

10 Revealed in a discussion with the Programmer and Statistician of the Education Management Information System of the Ministry of Education.
It is therefore important that the 2007 National Education Reforms established the National Inspectorate Board to provide total oversight responsibility for the setting of standards and supervision of pre-tertiary schools in Ghana. Additionally, the UPN system shall provide and enable accurate and timely data sharing between schools, Metropolitan/ Municipal/District Authorities, Regional and central government, thereby strengthening procedures for target setting and monitoring, policy evaluation and monitoring and improving the quality of school census report for informing policy decisions and supporting further research in the education sector and the entire economy. UPNs are expected to be used within the national pupil database (NPD\textsuperscript{11}); an education service information source, and in the medium to long term shall be expected to combine school census data with the results of pupils’ end of key stage assessments and external examinations such as Basic Education Certificate Examination (BECE) and West Africa Senior Secondary Certificate Examination (WASSCE).

During Annual School Census, as is the current norm of taking stock of school facilities including enrolment numbers by gender and by age groups; head teachers report on total numbers of pupils in attendance by gender and age group by filling the census questionnaire for onward submission to the District Education Office for collation and analysis. The UPN usage shall come along with a software that allows the management of big datasets and thus all heads of schools will confirm to the District Education Office of jurisdiction, pupils in attendance, withdrawn or have transferred to other schools. Using the software to track pupil/student movements the DEO which through the UPN system already has on the District data dashboard will be able to (i) ascertain how many pupils have transferred from one school to another within the District or out of the district; (ii) how many pupils during a particular academic year are overage or underage for their respective classes. Upon the introduction of the UPN all schools will be required to update the District Education Office with particulars of newly admitted for either generation of UPN for first time entrants or transfer of UPN from one district data dashboard to another. In this case, the District Education will have on its datasets\textsuperscript{12} list of all learners prior to annual census exercise. This allows the District Education Office during the exercise to determine through the software and based on questionnaire response to ascertain existing learners by checking what has been submitted against what is data repository. Thus, all schools will be expected through the school register to confirm to the District Education Office, the numbers of persons defined\textsuperscript{13} as enrolled in the school The UPNs can be used to assist in the tracking of pupils’ movement and progress within Ghana’s educational system either in the public or private schools. This will assist in the annual estimation of out-of-school children within a particular academic year. The approach or system is being proposed to facilitate a smoother movement of pupil information between schools, and Metropolitan, Municipal and District, Authorities (MMDAs), and other central agencies of the education sector. The use of UPNs will greatly facilitate the accurate interchange of data between partners and is a key element in strengthening procedures for target-setting and monitoring, thus contributing to the raising of standards.

UPNs shall be generated and issued by schools in collaboration with the District Education Directorate in the case of pre-tertiary institutions. In the situation of tertiary institutions, students will requested to indicate same UPN from second cycle schools during filling of tertiary education admission forms.

\textsuperscript{11}This is a database being proposed in augmenting the current school level data collected every year, but as the name implies will track movement of pupils through the levels of education.

\textsuperscript{12}Backed by a fit-for-purpose software.

\textsuperscript{13}During school census, where a pupil has been absent for a defined number of days without any information from parents/relatives, the person is defined as withdrawn.
Foreign students admitted into Tertiary Education institutions in Ghana shall be issued with UPN by the institution in collaboration with the National Council for Tertiary Education.

The National Pupil Database (NPD) shall be linked to District pupil Database which houses school level database through a fit-for-purpose software to be developed. The NPD combines data from the School Census with the results of pupils’ end of Key Stage assessments, external examinations and other accredited qualifications. The use of UPNs greatly facilitates the matching of pupil records. The NPD provides a platform for determining annual school census coverage rates, a variable missing in current school census reports.

6.2.4 What is the national UPN formula?
The UPN comprises a set of twelve (12) characters that includes (i) Metropolitan/Municipal/District Authority code, (ii) gender, (iii) pupil year-of-birth and (iv) pupil serial number. The UPN is expected to be allocated by the National Inspectorate Authority in collaboration with the Metropolitan/Municipal/District Authority and the schools. The combination of these characters is a simple means of guaranteeing uniqueness as no two pupils can be allocated the same UPN.\(^1\) This implies that each UPN is unique to the pupil to whom it is allocated. A UPN must never be re-issued to another pupil. Once a pupil reaches the terminal point in his/her education, the UPN must be archived as part of their school record.

Figure 1: the Unique Pupil Number explained.

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5.3 Data Protection Issues and Legislation

In order to uphold the privacy of the UPN, and to ensure all parties maintain anonymity to the extent possible, the Data Protection Act, 2012 (ACT 843) provides a window of opportunity for protecting the privacy of pupils/students or bearers of UPN and ensure UPNs are used only for educational and research purposes. Some of these shall include but not limited to: (i) The UPN must be maintained and used at all levels of education, (ii) the UPN shall be quoted on academic application forms by pupils during application into Tertiary level institutions in the country, (iii) the UPN must be a ‘blind number’ not an automatic adjunct to a pupil’s name, (iv) it must be held electronically and only output when required to provide information to the Metropolitan/Municipal/District Authority, Regional and Central Government or another school/academy to which the pupil is transferring.

Through the provisions in the Act 2012 (ACT 843), a UPN guideline and protocols\(^1\) shall be developed to provide framework for implementation. All Pupils shall have the right to receive, on request, a copy of any information the school holds about them (including their UPN), but schools shall not take any positive steps to inform pupils or their parents of the presence of the UPN system or give out details of a pupil’s UPN unless specifically requested.

\(^1\) The character combination makes it impossible for two persons to have same UPN even if they are twins and of the same gender.

\(^1\) This is expected to provide a detailed framework to guide the issuance, usage and tracking of bearers of UPN throughout the education cycle until learners exit.
5.4 Issuance and Use of UPN during school census and pupil transfers across schools and Districts

The issuance of UPN shall take the following steps: (i) all pre-tertiary\textsuperscript{16} schools (both public and private) shall be re-registered with a National Inspectorate Authority (NIA)\textsuperscript{17} irrespective of management under either the Ministry of Education or any other sector Ministries such as the Ministry of Health, Ministry of Employment and Labour Relations, and others. The educational institutions shall be required to submit list of enrollees identified by a six digit code to the District Education Directorate that will generate additional six digit serial numbers to complete the UPN. The complete UPN will then be stored in a software\textsuperscript{18} sent back to where the NIA through the District Education Directorate of jurisdiction. The six digits, according to the UPN, shall identify the District, year-of-birth and gender of each pupil. The NIA working with the Educational institution shall generate additional six digit serial number adding to the submission to complete the UPN. The UPN is thus generated by the NIA. In the case of

The implementation of the UPN shall assist parents and health officers together with education officers to determine and indicate a date of birth as a pre-requisite for school admission. The National Inspectorate Authority, working with the schools and other relevant stakeholders shall ensure that every pupil is issued with a birth certificate.\textsuperscript{19} Students will be monitored at annual school census exercise where each school shall be expected as done in annual school census, to indicate if all UPNs are (i) still in the school and at what class, and (ii) have dropped out or have transferred to the schools. Upon transfer of a pupil to another school, the UPN shall not change, but pupils will have to move with their UPN. In the case of foreign students who enroll in the Ghanaian educational institutions, they shall similarly, be allocated UPN with reference to the level of education through the collaboration of the school/institution of admission on one hand and the respective District Education Directorate and National Council for Tertiary Education on the other hand for pre-tertiary and tertiary institutions respectively. Hence, pupil/student from overseas will not have been allocated a UPN and should therefore be issued a UPN by the first maintained school/institution they attend

5.4 Has the 2007 Education Reforms position Ghana to improve education administrative data?  
In moving forward the proposal for use of a UPN, it is important to underscore the current legislations that can support or impede the effective implementation of UPN to improved education administrative data and improve policy decisions. The 2007 educational reforms among others established the National Inspectorate Board (NIB)\textsuperscript{20}mandated with setting of standards and inspection of all public and private pre-tertiary institutions\textsuperscript{21}. The NIB is positioned by the 2007 Education Reform and legislated by the 2008 Education Act, Act 778 to have oversight responsibility for inspection and supervision of both public and private pre-tertiary institutions. The 2007 Education Reforms has withdrawn the external inspection and supervision role of the Ghana Education Service and given the mandate to a new organization established under the Reforms. This goes to buttress the observation by Mehta (2012) that the Ghana Education Service does not have as much ownership of private schools as they do for public schools. Additionally, the 2007 Reform gave way for establishment of another organization that shall have oversight responsibility of teachers in both public and private pre-tertiary institutions through registration and licensing of teachers.

\textsuperscript{16} All non-tertiary public and private educational institutions  
\textsuperscript{17} Or any other Institution by legislation of Parliament  
\textsuperscript{18} Fit to purpose software to be developed to store and share individual student data at District level and platform share with the NIA.  
\textsuperscript{19} Where this is not available during admission, especially for schools in deprived communities.  
\textsuperscript{20} The draft 2015 Education Bill seeks to transform the Board into an Authority.  
\textsuperscript{21} 2008 Education Act, Act 778
5.5 Private school participation in annual school census
There has been increasing trends in private participation in both deprived districts and at the national levels, with steep rises recorded between 2013/14 and 2014/15, (Ministry of Education, 2015). This makes the private sector role in education provision an integral stakeholder and as such it very expedient that protocols for ensuring that annual school census fully covers all of them. This said, the inability of the census to adequately cover all public and private schools, (ECOWAS, 2015) because there is no identified dataset of all schools in the country and unwillingness of some private schools to participate in the annual school census (Mehta, 2012); requires the education sector to institute a legislation for providing the legal framework for improving education administrative data management.

5.6 Regulation of all public and private schools through a legislation
Establishment and operation of private pre-tertiary institutions in Ghana is backed by the Article 25(2) of the 1992 Constitution of the Republic of Ghana. “Private schools are required to register with the Department of Social Welfare at the District levels after registration with at the Registrar General's Department for the operation of preschools- crèches, nurseries and kindergarten. When school managers begin the operation of primary and junior high schools, they are required to proceed to register with the Ghana Education Service at the District level”.22 The Annual school census report record significant numbers of unregistered private kindergarten, primary and junior high schools, EMIS (2015). It is therefore not clear how many of the unregistered schools are out there out of which a percentage have voluntarily submitted completed questionnaire. This includes private schools not found on the list of registered schools with the Ghana Education Service and captured in the Education Management Information System, EMIS. Thus, the ECOWAS peer review team on education statistics observed that despite the timely data submission by EMIS- Ghana, there was the absence of documented Policy, Norms and Standards for the management of education information (ECOWAS, 2015). Article 25 (2) of the 1992 Constitution of the Republic of Ghana provides opportunities for introducing legislations under which established private educational institutions shall be required to operate. This can be explored to ensure passage of legislations that will bind private schools to operate under stipulated standards and norms. Currently, the absence of a legislative framework has impeded efficient data coverage to improve to the annual estimation of those that are not in school. Through dialogue and stakeholder consultations, the sector can arrive at a legal framework or revise the draft framework23 to ensure that there is a collective agreement between associations of private school operators and the government. The on-going participation of the National Association of Private schools at the Annual Education Sector Performance Reviews provide better platform for initiating dialogues around the legislations and regulatory frameworks. Another important area is the questionnaire or instrument for data collection.

5.7 Addressing the date of birth of pupils during admission
The introduction of the UPN will assist school managers and teachers to work with parents and ensure that date-of-birth of pupils are captured once during school enrolment. The calculation of pupils with appropriate ages for a particular level defined by the net enrolment rates has continued to pose

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22 Interview and Discussion with the Private Schools Coordinator at the Ghana Education Service. The Officer has continued to be involved with private schools registration and operation for almost 15 years.
challenges as teachers find it difficult to obtain date-of-birth of pupils. With UPN, the schools will have the privilege of capturing pupil date-of-birth once during admission, this will automatically assist the education sector at any time to identify through database how many persons are over age or are in age appropriate classes. The use of the UPN which also helps to capture the gender of each pupil will be very useful for the Computerized School Selection and Placement System to correct pupil information during completion of the registration where a pupil selected male instead of female.

7. Conclusions & Recommendations
In summary, administrative data are more comprehensive than are purpose-built survey data, and can be collected more frequently accurately. Furthermore, the costs of conducting research with administrative data are much lower as well, at least once the data systems are developed. This can support numerous tracer studies aimed at evaluating the impact of a particular education intervention on educational outcomes of learners. More importantly, the database will assist the education sector to estimate the current numbers of those that are not in the school system.

The UPN together with attended or proposed institutional structures and legislations will provide a more adequate and consistent platform for producing a more reliable education administration for improving education planning and management in Ghana. Once data structures are established, linking and extracting more records from administrative data will cost only the time of the programmer, and the marginal cost of adding additional individuals or periods of data to the analytical sample is extremely small, suggesting remarkably large economies of scale associated with administrative data (Roed & Raaum, 2003).

A fit-for-purpose software will have to be developed for administrating and managing the student level data tracking and provides various levels of access to different users in order to ensure that the privacy of learners are protected in accordance with the data protection Act 2012, Act 843 and in line with the protocols for issuance and management of UPNs.

In the light of these, the paper recommends preparations for capacity building in the areas of applied statistics and computer science towards acquisition of skills for the management of big data. This of course should include support for development and use of software that can support our current technological architecture.

8. Suggestions for future Research
With the use of UPN in the educational system of Ghana, giving government the opportunity to know how many Ghanaian children are in both public and private institutions opens the platform for further research on how the known contribution of the private sector can be tapped through various interventions and supports for private sector participation in education service delivery.

9. References


