

Research management in Cameroon Higher Education: Data sharing and reuse as an asset to quality assurance¹

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Abstract

Data sharing and reuse (DS&R) is seen to be a fundamental step towards sustainable quality assurance (QA) in research, and consequently a crucial part of research management (RM) in the higher education system. This chapter examines the concept of DS&R in research in Cameroon, links it to the notion of QA, and demonstrates that DS&R must become a good practice in the research continuum in Cameroon.

1 Introduction

Nowadays, information and communication technologies (ICTs) constitute one of the major mechanisms used to create and manage knowledge and data in almost all domains of human activity. They are essential in our daily lives, they shape our minds and vision of the world and “increase our ability to learn about more human behaviour” (UN Global Pulse, 2012: 6). New media, as well as new ICTs are important within the academic context in many ways, e. g.:

- as a means or medium of communication, administration and teaching;
- as instrument and focus for research in various academic disciplines;
- as a means or medium to create, organize, manage and share information or data.

The systematic collection, interpretation and evaluation of data for contributing towards science, i. e. scientific research (Çaparlar & Dönmez, 2016: 212), is a prerequisite to sound development in any country of the world, and therefore has a preponderant role in the strategic management of the nation. In fact, research is for any

¹ This paper is an offspring of my ongoing Project Action Plan (PAP), proposed during the DIES International Deans' Course "Africa" 2017/2018. The DIES-IDC is a training I got from the Osnabruck University of Applied Sciences between June 2017 and February 2018 on HE management. The PAP I proposed was entitled "Developing an online Faculty Research/Publication Repository". This paper is the result of the flaws I noticed in the execution of this PAP. I wish to seize this opportunity to extend my profound gratitude to Prof. Dr Peter Mayer and his team for the opportunity offered to me to get acquainted with issues of HE Management, as well as the possibility to contribute a paper to the present volume. My heartfelt gratitude equally goes to the Marc Wilde whose careful review of the initial paper led to this improved version.

nation of the world, what blood is for the body. In Cameroon, two officially recognised institutions are in charge of research and innovation in the country: the Ministry of Scientific Research and Innovation (MINRESI, from the French acronym *Ministère de la Recherche Scientifique et de l'Innovation*) and the Ministry of Higher Education (MINESUP, from the French acronym *Ministère de l'Enseignement Supérieur*). The main actors of MINESUP², the teaching body, are called “teachers-researchers” (or “enseignants-chercheurs” in French), as their role in the university setting is not only to impart knowledge but also to involve in scientific research. This is clearly spelled out in their working contract: “The contracting party is recruited as an Assistant-Lecturer of [...]. The contracting party shall be required in this capacity to do teaching, research and related duties”, as well as the mission statements of the eight state-controlled universities. These are two examples from the University of Buea (English-speaking university) and Maroua (French-speaking university) respectively:

The mission of the University of Buea is to provide opportunities for quality education through teaching and research in an environment that is conducive to such pursuits and in ways that respond to market forces. [...]. Its teaching and research programmes emphasize relevance, encourage tolerance and promote creative, critical and independent thinking (<http://www.ubuea.cm/about/>).

The missions of the University of Maroua:

- To develop and transmit knowledge;
- Raise the university to the highest standard and pace of progress and the cutting edge of culture and research (my translation);
- [...]. (<http://www.univ-maroua.cm/>).

The main role research plays in state and private universities in Cameroon constitutes a reaction and alignment to the general policy on research clearly ascribed in the various laws governing the practice of higher education in Cameroon. The decree No. 2012/433 of 01 October 2012 organising higher education (HE) in Cameroon states that the Ministry of Higher Education is responsible for the sustainability of the traditional missions of higher education as well as the promotion and diffusion of university research.

In an environment of rapid development of information and communication technology (ICT) like the one we are living in presently, research has proven to be an important asset to economic and social development. Consequently, African universities must fully incorporate best practices research in their strategic management. DS&R, thanks to the phenomenal growth of the ICTs, is one of those professional and scholarly procedures that are generally prescribed as effective in research. Yet, the sharing of research results seems to be a daunting task among teachers-researchers in the Cameroon university system. Despite the established benefits of DS&R in universities with well-established research traditions, there is still no awareness on the necessity to share data. Moreover, no standardised methods as well as official,

2 My interest in this paper is on Cameroon Ministry of Higher Education.

well-planned structure or mechanism ensure the dissemination and sharing of research results amongst researchers as well as with potential users.

The purpose of this paper is to discuss DS&R as a good-practice and asset to quality research, in relation to the state-of-affairs of research activities in Cameroon higher education (CHE). I introduce DS&R as a potential booster to research and quality assurance in both teaching and research, as good teaching goes hand-in-hand with good research. More specifically, I unveil the actual tradition of DS&R, as well as the patchy attempts for data sharing in CHE. By doing so, I make visible colleagues' and stakeholders' perceptions of DS&R practice and service, and contribute to the on-going debate on DS&R, quality assurance and higher education management in Africa using the experience of research activities in CHE.

2 What is Data Sharing and Reuse and what is it good for?

DS&R is a system whereby data is shared and (re)used in a structured manner in the scientific community in order to encourage scientific enquiry and debate and also promote innovation and potential new data creation and uses (Cragin, Palmer, Carlson, and Witt, 2010; Borgman, 2012; Guedon, 2015). DS&R is actually an old practice in scholarship, but which has gained momentum today thanks to the rapid growth of ICTs in all sectors of human activities. Guedon (2015) recognised that fact when he declared, "Across the centuries, researchers have learned to share their papers, now they must learn to share their data." Today more than ever before, the scientific community widely accepts data sharing and considers this practice as a crucial activity for scientific research. The benefits of DS&R have been widely acknowledged in the literature. Indeed, OECD (2015: 26), following Zahedi, Costas and Wouters (2013), admits that sharing data:

- allows verification of scientific results but also re-analysis of data for different purposes from the ones originally conceived, promotes competition of ideas and research (Gardner et al., 2003);
- can increase the citation rate of scientific papers (Piwowar, Day & Fridsma, 2007; Piwowar and Vision, 2013);
- fosters collaboration (Piwowar and Chapman, 2008; Brase et al., 2009);
- allows the use and reuse of data from other researchers and individuals (Groves, 2010);
- reduces duplication of effort from different researchers attempting to collect the same data sets (Kowalczyk and Shankar, 2010);
- foster good scientific behaviour (Mooney, 2011);
- protects against faulty behaviours and fraud in science and research, and may contribute to improve data collection and management (Grieneisen and Zhang, 2012).

Furthermore, the UK Data Archive suggests a number of reasons for sharing and enabling reuse of data:

- encouraging scientific enquiry and debate:
- by encouraging the improvement and validation of research methods
- by maximising transparency and accountability through scrutiny of research findings.
- promoting innovation and potential new data uses:
- leading to new collaborations between data users and data creators
- reducing the cost of duplicating data collection
- increasing the impact and visibility of research
- providing credit to the researcher as a research output in its own right
- providing great resources for education and training. (ANDS, 2018).

As for the reusability of research data, it is the practice whereby a set of data collected by a first person or people, is reused by someone else or other people. Thanos (2017, p. 1) states that data reuse allows the questioning and reanalysis of evidence, reanalysis of old data in the light of new data, reproduction and verification of results (to find out whether or not a researcher comes to the same conclusions as the producer of the data). Data reusability minimizes duplication of effort, and builds on the work of others. It has four main dimensions: *policy*, i.e. a set of principles or strategies adopted by the organization responsible for data submission and usage; *legal*, a binding regulation on the sharing and reusability; *economic*, on the reuse cost and economy, and *technological*, the design of appropriate software reuse technology.

Dwelling specifically with scientific publications and considering the research conditions of African universities, Arzberger et al. (2004) admit that “data sharing is especially important for researchers in developing countries who have fewer possibilities to undertake expensive and time-consuming data collection efforts” (as cited in OECD, 2015: 26). Yet, despite the amount of data created in Africa, DS&R is still not a practice in our universities.

3 DS&R, Quality, and Quality Assurance in HE

The Bologna initiative consecrated the European ministers of education’s determination “to commit themselves to supporting further development of quality assurance at institutional, national and European level”, emphasizing on “the need to develop mutually shared criteria and methodologies on quality” (Berlin Communiqué 2003). Since then, the topical themes of “quality” and “quality assurance” in HE have been at the centre of constant academic debates. The best practices or standards developed as a follow-up to this determination to achieve quality education through “quality” and “quality assurance” is geared towards the three core missions of universities, i. e. teaching and learning, research and public service (Kivistö and Pekkola, 2017, p. 1), and more recently, quality administration. In the few lines below, I will briefly exam-

ine the connection between quality assurance (QA) and the concept of DS&R, after defining the term “quality” in the context of HE from three perspectives: teaching/learning, research and administration/management (TRA). I consider the concept of “university as a supplier of commodity” (public service), as part of quality TRA.

3.1 Quality in Higher Education

Quality is primarily an integral part of higher education. Considering the evidence that knowledge produced in universities must and should always be the plinth onto which societal transformations rest, in a time when institutions’ academic reputation is a worldwide concern (manifested in permanent ranking), quality must be at the centre of all activities namely TRA. The seminal work of Harvey and Green (1993) as well as (Harvey, 2006) proposed five dimensions of quality in HE: “exceptionality or excellence, perfection or consistency, fitness for purpose, value for money, and transformation” (Kivistö and Pekkola, 2017, pp. 6–8). With the effects of socio-economic development pressures on African countries, and given the role of African universities in the overall transformation of Africa as defined by African politics, quality TRA in African HE has “become a strongly politicised issue”, as opined by Crebbin (1997, para 1).

Quality teaching i. e. “the use of pedagogical techniques to produce learning outcomes for students” (Hénard and Roseveare, 2012, p.7), is crucial and can be achieved through a number of policies as part of institutional management. These include: awareness raising on quality teaching, development of excellent teachers, engagement of students, building of organisation for change and teaching, alignment of institutional policies to foster quality teaching, highlighting of innovation as a driver of change, and impact assessment” (Hénard and Roseveare, 2012, p.5). As for quality research, it is seen as the scientific process encompassing all aspects of study design including judgment regarding the correspondence between the methods and questions, the choice of subjects, the measurement of outcomes, the protection against systematic and non-systematic bias, and the inferential errors (Boaz & Ashby, 2003; Lohr, 2004; Shavelson & Towne, 2002). Among the prominent characteristics of good quality research (robust, ethical and standing up to scrutiny), “informing policymaking” (UKCCIS Evidence Group, 2015), i. e. for example contributing to the socio-economic development of a country, is of great interest to this study as it has a direct link to quality assurance as we shall demonstrate shortly in the lines below. Finally, quality administration in higher education for its part, has also been at the centre of scholarly debates as well as in political circles. CHE is a typical example where the term “administration” in State Universities has a complex definition. In our universities, the traditional dichotomy between academic and administrative staff has become completely hazy. Indeed, it has become a norm that academics are appointed or elected to participate in almost all administrative activities, including, heads of department, heads of divisions of teaching, research and publication, deans, directors, Vice-Chancellors, etc. In fact, it seems that some of the activities of HE demands that type of blend, and the convocation of various competences from the ad-

ministrative and academic staff is a necessity. Kivistö and Pekkola (2017) rightly purported that the administrative function in universities should be seen as a diverse assemblage of tasks and activities, ranging from basic secretarial work and maintenance services to highly skilled specialist and professional activities (p. 9). Some of the administrative tasks indispensable for the smooth running of the university include:

research and planning, student services, general administration, study administration, human resource management, financial administration, legal advisory services, research and innovation services, as well as more entrepreneurial activities such as alumni affairs, marketing and public relations and business development. In addition, supporting services such as library, ICT, capital and property administration, operations and maintenance can equally be considered as elements of administration (Szekeres 2004; Gray 2015 cited by Kivistö and Pekkola, 2017, p. 9).

Considering these ranges of activities, ensuring quality administration is synonymous to getting the right people for the right tasks in order to guarantee efficiency and effectiveness.

In short, on the notion of quality in higher education, my take is that quality TRA in higher education matters to stakeholders, and consequently constitute a permanent challenge for the latter at a time when the African higher education sector is under the pressure of addressing the societal challenges of African milieus. Having briefly discussed the concept of quality in higher education, I now turn to operations and activities aiming at ensuring quality in HE.

3.2 Quality assurance in Higher Education

Quality assurance (QA) is a system typically consisting of a number of connected aspects serving several purposes such as accountability, control, evaluation, measurement and quality improvement (Matei and Iwinska, 2016, p. 19). The Finnish Higher Education Evaluation Council defines QA as “the procedures, processes or systems used by HEI to safeguard and improve the quality of its education and other activities” (FINHEEC, 2008). These two definitions give the pretext to suggest that assuring quality in HE entails assuring quality at the three levels of TRA against the criteria of accountability, control, evaluation, measurement and quality improvement as discussed above. QA is a matter of individual and collective responsibility, as well described in the four components proposed by NAAC and COL (2007, cited by Kahvecia, Uyguna, Yurtseverb, İlyasb, 2012, p. 162):

1. Everyone in the enterprise has the responsibility for enhancing the quality of the product or services;
2. Everyone in the enterprise has the responsibility for maintaining the quality of the product or services;
3. Everyone in the enterprise understands, uses and feels ownership of the systems which are in place for enhancing and maintaining quality;
4. Management regularly checks the validity of the system for checking quality.

By individual, I refer to teachers, researchers, administrators in their daily duties, and by collective I refer to the department, the faculty, the university and the ministry as whole entities.

QA in teaching/learning entails the monitoring of teaching through effective teaching using appropriate didactic material, putting the learner at the centre of the teaching/learning process and guiding the latter. This can be called “performance” and it is supplemented by the consciousness to make teaching permanently better for optimal learning, i. e. permanent improvement. According to the University of Readings (2019, para 1), QA in research (QAR) encompasses all methods, systems and resources that are used to give assurance about the care and control with which research has to be carried out. QAR is typically concerned with:

- the responsibilities of those involved in the research
- transparent project planning
- the training and competence of research staff
- facilities and equipment
- documentation of procedures and methods
- research records
- the handling of samples and materials

As for QA in administration, the ultimate goal of quality control in administrative activities in HE is to improve in performance and get the desired results, the same way as what obtains in teaching and research. Indeed, QA in administration implies a number of tasks including defining administrative functions and desired performance levels, specifying performance standards and measuring performance in an objective and consistent manner, training where performance is poor, and implementing controls to maintain quality (Markgraf, 2019). In short, those high quality activities in the university administration are aimed at increasing efficiency, improving output and achieving set goals.

Higher institutions of learning that are keen to QA have education and research policies set out in manuals for QA in TRA. Improvements in all the three aspects are monitored during planning and control cycles.

3.3 Quality assurance and DS&R in CHE

In a world where “quality” has become one of the main concerns of institutional management and of all the other stakeholders of HE, debates, ideas, reflections on best practices based on empirical data definitely constitute a source of inspiration and basis for exchanges between highly advanced and less advanced societies. Consequently, storing data in an organised manner for the ultimate goal of sharing is an asset of international cooperation and collaboration. A universal alignment on a set of scientifically argued best practices in TRA, in quality and QA in HE can only be beneficial for science, socio-economic well-being and consequently for the improvement of human conditions. If empirical data on quality and QA on TRA are stored in one or more servers in the network with the intention of sharing, the spreading of

best practices in TRA becomes effective, efficient and sustainable. In effect, sharing data at these three levels permits verification of scientific results, increases the citation rate of scientific studies on those fields of research, fosters collaboration, and allows the use and reuse of data.

Thus, the link between DS&R and QA lies in the evidence that each of the four components of QA need the four main dimensions of DS&R: policy, legal, economic and technological (Thanos, 2017), for their optimal realisation. For convenience’s sake, I have adapted the four components of QA to the context of HE:

1. Everyone in the university has the responsibility for enhancing the quality of TRA.
2. Everyone in the university has the responsibility for maintaining the quality TRA.
3. Everyone in the university understands, uses and feels ownership of the systems which are in place for enhancing and maintaining quality.
4. Management regularly checks the validity of the system for checking quality (curled from NAAC and COL, 2007, cited by Kahvecia et al., 2012, p. 162).

The figure below summarises the connection between DS&R and QA in HE:

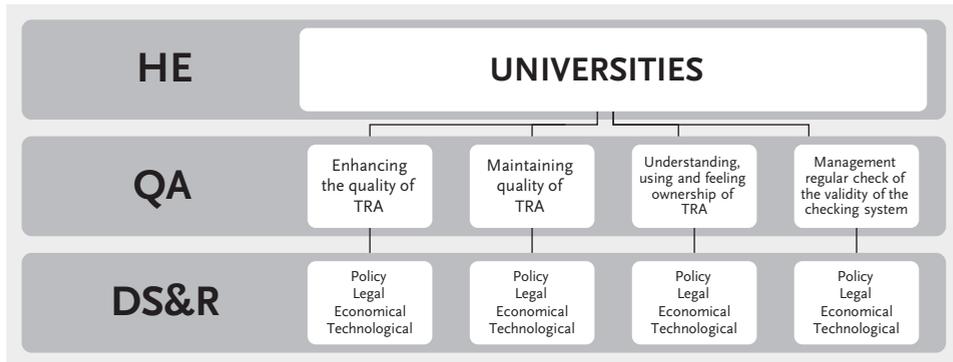


Figure 1: The connection between DS&R and QA in HE

In other words, the four dimensions (policy, legal, economic and technological) of DS&R are part of the main components and boosters of QA. Said differently, DS&R is the plinth onto which QA rests in the HE milieu. A well-defined policy, a concerted legal framework, an economical strategy on costs and a well-planned technological infrastructure of DS&R permit to enhance and maintain quality in TRA. Likewise, they enforce understanding, usage and feeling of ownership in TRA, and condition management to check the validity of the checking mechanism regularly. Thus, it is a fact that DS&R is central to sustainable QA in TRA in the HE system. As indicated before, issues of quality and QA in TRA have been at the centre of academic debate in recent years, with the ultimate goal of having a more functional and cost effective HE. Research on how to improve on one’s institution’s academic repu-

tation (e. g. through working hand-in-hand with students, having a brand strategy, institutional engagement), on how to get strong internal and external quality assurance systems, etc. can be shared and reused in a systematic way to avoid reduplication, waste of time, energy and money. African countries are still lagging behind in this industry of “new” knowledge, and my study can be seen as a step toward raising awareness of scientists interested in African studies.

4 Research and funds in CHE: From paradox to cynicism

Cameroon hosts 121 higher learning institutions, divided into eight state-controlled universities³ and 113 private institutions⁴ (Campus Jeune, 2018). Private universities in Cameroon must be duly accredited by the MINESUP, which follows up, controls and evaluates their functioning. Thus, private universities in Cameroon are placed under the tutelage of the MINESUP. The latter delegates this privilege to its state universities by asking them to control the contents and quality of teaching and research of the private institutions and co-sign their certificates.

As indicated earlier, research is supposed to take a big share in the portfolio of both state-controlled and private universities, under the impulse of the MINESUP. Consequently, to mark the importance of research in state universities, the position of Deputy Vice-Chancellor in charge of Research, Cooperation and Relations with the Business World (in the Anglo-Saxon universities), and Vice-Rector in charge of Research, Cooperation and Relations with the Business World (in the French tradition universities) was created in all state universities. This top-management position is to assist the Vice-Chancellor and Rector in the area of good governance in teaching and research. Thus, the DVC/RCB (or VR/RC) is to ensure the effective practice of research in our universities, be they state-controlled or private. In all state universities therefore, there are units dedicated to research activities. In Buea, for example, to cite only that case, the research unit is a powerful wing of the university structure:

The Division of Research and Publications is one of 3 central administrative units under the supervision of the Deputy Vice-Chancellor in charge of Research, Cooperation and Relations with the Business World. The unit is a common feature of the organisational structure of all public universities in Cameroon, who have the mandate to support the development, promotion and dissemination of research for development. It serves as the Secretariat of the University of Buea Scientific and Research Committee. (University of Buea [UB], 2018, Presentation of the Division, para. 1).

3 The eight state universities are divided into English-speaking or Anglo-Saxon universities, i. e. Buea and Bamenda (created in 1993 and 2011 respectively), and bilingual universities (English and French are used), i. e. Douala, Dschang, Maroua, Ngaoundere, Yaounde I, Yaounde II created in 1993, except Maroua in 2008.

4 Many more universities are private in Cameroon. However, we are interested only in those duly accredited by state i. e. the MINESUP.

The mandate of the research department of the University of Buea, as well as the ones of all state universities, is to ensure that research is effective in CHE. In Buea for example, their portfolio is to:

- search and inform staff about funding and capacity building opportunities relevant to research development,
- plan and deliver consultation and capacity building activities,
- monitor research activities to ensure compliance
- management grants
- track research outputs
- report research to inform strategic management and enhance uptake
- organise dissemination activities targeting internal and external stakeholders
- promote staff publication.

Thus, considering the organisation of research activities in CHE (from the Ministry of HE to its decentralised structures like the public and private universities), at least on paper, one would not be exaggerating to say that research activities should be flourishing in Cameroon. Unfortunately, the situation on paper is far from the reality.

The very first handicap of research in CHE, and definitely the most important, is funding. Money is the sinews of research! Conducting research without or with very little funding is as good as not doing research at all. Unfortunately, the lack of money to do research in CHE is just a tiny part of a more complex and general problem of funding tertiary education in the country. In Cameroon indeed, the funding of higher education has mainly been the responsibility of the state since its inception in 1972, till its profound reform in 1993. Unfortunately, for many years now, CHE has been facing an unprecedented financial crisis that is clearly seen in the increasing imbalance between the need for quality education and the limited resources available. It is so obvious that universities in Cameroon do not have sufficient financial resources to function (Pokam, 2016: 105). This is the case for both the state and the private higher learning institutions, which are highly dependent on subventions from the government. When revisiting the main issues plaguing higher education in Africa, Saint (1993: 6), as cited in (Pokam, 2016: 105), states: « à des degrés divers, on considère généralement que les principaux problèmes de l'enseignement supérieur en Afrique sont la qualité, l'utilité pratique, le financement, l'efficacité, l'équité et la gestion » (at various degrees, the main issues plaguing higher education in Africa are quality, practical utility, financing, efficiency, equity and management [my translation]).

In short, funding is a major handicap in the smooth running of CHE, as the pot of money the government puts at the disposal of the universities for their function is just too small, making the chances of having quality research a challenge to the universities and their stakeholders. Although there is provision in the budget of the MINESUP to support academic research, the pressure is so high that the line allocated for research is used for other pressing issues that cannot wait. Oh, yes, re-

search can wait, or if you really feel like doing research, then look for your fund! In other words, universities are to generate their own research funding, and since they fail to do so, individual teachers-researchers have to take the responsibility of applying for research funds out of the country. The point I am making is that there is no pot where research money is kept for individual or team researchers to compete for in the country. In “The University of Buea Research Policy and Management Guide 2007–2012”, the section on funding reads thus:

- Create a University of Buea Research Fund and develop strategies to sustain it;
- Progressively step up research funding to attain 15 % of the total budget of the University by 2012;
- Develop strategies to step up private sector funding of University research to at least 30 % of the total research budget over the next 5 years;
- Develop and implement guidelines for the measurements of research output. (University of Buea, 2008, p. 2).

Thus, it is obvious that each university must thrive to canvas for funds for research. The irony of the matter is that despite this nice plan to raise funding for research for the University of Buea scientific community, couched in beautiful words, nothing of such has ever been done, and 10 years after the set deadline, no evaluation was made to take stock. In such an environment, the teachers-researchers of the University of Buea have no other choice than to battle to secure funds for research. The irony of the situation is better appreciated when it is recalled that the main condition for promotion in CHE is publishing in national and international peer-reviewed journals. Thus, the same system asking you to publish or you perish, has no funds for you to do research. Is that not cynical?

Briefly, individual teachers-researchers in CHE will not do research if they do not have grant application skills to compete at international platforms. In such an ecology, what can be the take of DS&R?

5 DS&R in CHE: A myth, or the reality of a myth

Let me go straight to the point. The nice discourse of the Ministry of HE on the importance of research, and the necessity for good and sustainable research for the development of Cameroon, has no provision for the contemporary issue of sharing and reusing data for the benefit of the Cameroon scientific community. Thus, despite its multiple benefits, the practice of DS&R does not exist in a systematic way in CHE. Researchers do reuse data, but without knowing that they are performing a task that has evolved to the level of becoming a standardized practice supported by the ICTs, and constitute, nowadays, a guarantee for adding value to existing data. In other words, DS&R is done the traditional and cumbersome way which consists of asking whoever has a copy of an article to make it accessible to you. Therefore, a hard copy of a publication can be sent to colleagues via post, personal visit or through an inter-

mediary. One can also use floppy disks, CD-rooms, USB keys, etc. to pass the data, transfer the data from one computer to another using a USB cable, or email the paper. For colleagues who have the abilities and access to modern technologies, they can download (illegally posted) publications of peers, unfortunately, in total disregard of the issue of copyright, and without permission from the author or publisher. Yet, the kind of research data sharing we are advocating concerns data stored in servers in university networks with a well-organised structure of regulated access embedded in a database management system (DBMS). Nowadays, this is possible thanks to the sound advances in software, hardware, and wireless connectivity. Such a system will enable the sharing of research information between researchers, data managers and institutions on a wide range of research disciplines and environments. It will also help to produce high quality research data with the enormous potential for long-term storage and use. Even information sharing between computer networks, although not the ideal, will be a good start. But the system we aim at is one where files are easily distributed via access to digital media, such as computer programs, multimedia (audio, images and video).

Presently, such a well-oiled research data sharing machine does not exist in CHE. Fortunately, the four main dimensions of DS&R, i. e. policy, legal, technological and economic (Thanos, 2017), call for well-planned strategies geared towards reversing the lukewarm attitude of the major stakeholders. The question of the creation and optimization of DS&R in Africa is a package that contains various solutions to a number of related issues ranging from attitude, mentality to infrastructure and technology. Speaking about attitude, Pier Paolo Di Carlo, a professor of anthropology of the University of Constance declares:

Hey, for my experience in Cameroon, I think one main problem is fear to share because then ideas can be stolen with no credit given to who initially shared the idea/data. So, probably instituting a safe way to get one's name associated with some data (if one wants to) could be a prerequisite for inviting people to use it a lot to get visible. I think the problem of engagement of contributors is central (pc).

However, it will be inaccurate to contend that data is not being shared using technology, at least at a basic level. There is localized and intermittent data management and documentation practices of researchers, but generally in partnership with colleagues from Europe, America or Asia. Consequently, as rightly put by Shen (2015: 157), "All the potential values of data newly created for future research are lost immediately after the original work is done". Thanks to sporadic research activities of individual faculties towards the creation of data in a reusable format⁵, Cameroon has the privilege to host an extension of the DOBES⁶ Archives, the Archive of Languages and Oral Resources of Africa (ALORA). ALORA is the digital archival interface of the Centre International de Recherche et de Documentation sur les Traditions

5 One of the type of research results presented in the form of reusable data is language documentation, a relatively new field of linguistics that aimed at "providing a comprehensive record of the linguistic practices characteristic of a given speech community." (Himmelman 1998:166).

6 DOBES, the acronym for "Dokumentation bedrohter Sprachen", is a programme that the Volkswagen Foundation started in 2000 to document languages that are highly endangered in the world.

et les Langues Africaines (CERDOTOLA). It was set up in February 2014 as a regional archive with the technical support of the Max Planck Institute for Psycholinguistics, within the framework of the INNET project.

ALORA is an example of collaboration between researchers in the field of linguistics, anthropology, cultural studies, sociology, etc. ALORA is an example of collaboration between researchers in the field of Linguistics, Anthropology, Cultural Studies, Sociology, etc. A discussion with the director and curator of ALORA, Dr Emmanuel Ngué Um, confirms that ALORA is an example of a DS&R platform. Indeed, considering that the term “data sharing” widely applies to public repositories that are host to resources deposited and accessed without restriction, ALORA is a language archive which is open without restriction to any depositor, as long as their data is compliant with commonly agreed archiving standards (file format, provision of metadata, file naming, etc.). As a principled specification of ALORA’s policy, once data is deposited, it must be made public and should be freely accessible. However, depending on issues such as privacy rights and other sensitivity variables (religiousness, cultural taboos, etc.), the owner/depositor of a data may apply or require access restrictions to part of his/her corpus for a limited or extended period. He/she may also grant access to all users or to a limited set of users. The “sharing” value that ALORA adds to data-driven research is in the fact that, individual or institutional data that have been used in the publication of piecemeal research may be double-checked by peer researchers or, in the case of academic research, by a panel. In current research practices, attention is paid to and credentials given only to the final product of scientific investigation (article, book, thesis, etc.). By contrast, a data-sharing perspective is one where the process of research, from data to publication, is supported by an integrated environment. This makes it possible for others to access and, if necessary, verify the raw source upon which a given analysis is grounded. As for reusability, it is embedded in the philosophy of data sharing. In simple terms, it could mean that the same data set or collection is used for different research purposes and in different circumstances.

CERDOTOLA is an inter-state organization which is committed to documenting, preserving and promoting the rich, yet endangered African cultural and language heritage through concrete actions such as:

- funding of scientific research and publication,
- organization of scientific and cultural meetings throughout its member States,
- training,
- language & cultural documentation,
- and archiving

With these objectives, the Max Planck Institute for Psycholinguistics, which is also highly involved in the documentation of languages and cultures, found the ideal partner.

Yet, the challenges faced by ALORA are many. The instability of fast internet connection, the ignorance of colleagues about its existence and how to get to use it,

the resistance to changes and innovations shown by some, the timid institutional support, etc. made that the potential of ALORA is still highly underused.

The hope of a near-future improvement in that domain of university research management comes from the fact that the Ministry of Higher Education in Cameroon is doing a lot to improve on the cyber infrastructure in state universities. A number of actions attest to that:

1. Extension of the functions of Deputy Vice-Chancellor in charge of Teaching that became Deputy Vice-Chancellor in charge of Teaching, Professionalization and Development of Information and Communication Technologies (DVC/TIC). The portfolio of the latter is, in addition to teaching, to initiate and implement policies for ITCs in the Cameroon State Universities. Thus, the success of ITCs in a State University lies in the ability of the DVC/TIC to gather the synergy that will “make things happen”. The importance of personal touch in the management task may partially explain the reason why some state universities are more advanced than others in the acquisition ICT facilities and implementation of e-based tasks.
2. The creation of structures where ITCs are used and promoted in collaboration with foreign partners, e. g.:
 - a) Virtual Universities for E-teaching and learning (in Partnership with: The African Union, India, the Ministry of Post and Telecommunication (MIN-POSTEL), the Ministry of External Relations (MINREX), the University of Yaounde 1 (UYI), and Cameroon Telecommunication (CAMTEL)).
 - b) The Institute of Numeric University Governance.
 - c) The Inter-University Center of ITCs as a platform for the collaboration of between higher education learning institutions on matter of ICTs and cyber knowledge and practices.
3. Collaboration with potential ICT-inclined partners like Orange Cameroon⁷, Mobile Telecommunication Network (MTN), CAMTEL, at the national level, and the Pan African Institute of University Governance at the regional level.

In short, the importance of technology in research and education is no longer the sole concern of educationists, but has become a priority on the agenda of the top management of Cameroon educational system as a whole. Since 1998, the efforts started in private schools to integrate ICTs into the curriculum of primary and secondary schools in Cameroon was successfully echoed by the public schools as from 2001 (Fouda, Ndjodo, Ngah & Zobo, 2013 and Ngajie & Ngo Mback, 2016).

Thus, since robust cyber infrastructure is the plinth onto which DS&R rests, we think that the pathway to innovation embracing digital research data sharing is not too far from now. Decision makers of CHE are deeply aware of the importance of ICTs in the daily lives of Cameroonians, and are doing tremendous efforts to make it a reality in State and Universities. Private institutions are also following the move for a better CHE.

7 A Cameroon mobile telecommunications operator.

6 Conclusion

Nowadays, in the name of QA in HE, research activities are conducted in all sectors relevant to the improvement of HE systems. Today more than ever, it is a truism that there is a growing necessity for African scholars and well-trained scientists to contribute to innovative paradigms that will foster development on the African continent, and boost the participation of Africa in the knowledge economy. Thus, the storage of research data on TRA is beneficial to the scientific world and, in turn, to the society. That is why DS&R is seen as a gage, condition or plinth to QA in HE. If good quality research “should adhere to principles of professionalism, transparency, accountability and auditability” (UKCCIS Evidence Group, 2015) then, DS&R is pivotal in this process. Considering the gap that the African HE systems have in terms of quality, QA, and even DS&R, promoting innovation and potential new data uses, and encouraging scientific enquiry and debate through DS&R is a sustainable approach to upgrading and sustaining the quality of TRA.

Although data is created in Africa, DS&R is not yet a cyber-based practice as it is not even seen as a modern scientific practice that allows reanalysis of evidence, reproduction and verification of results, minimization in duplication of effort, and building on the work of others (Thanos, 2017). Neither is it seen as part of good practices in the management of research in higher education. However, the potential is there and sensitization is the driving force needed for the emergence of the culture of data sharing and publication, open access, and reuse of data.

Understanding research data sharing and reuse practices of academic faculty researchers is important to the development of data infrastructure, management, preservation, and curation systems at an academic institution” (Shen, 2015: 158). DS&R is not only a solution to the lack of enthusiasm towards research activities, but also an obvious connection between research management and quality assurance. Data sharing, despite its numerous challenges, offers excellent opportunities to improve on the management of research in higher education in Africa.

References

- ANDS (2018): Data reuse. Retrieved from <https://www.ands.org.au/working-with-data/publishing-and-reusing-data/data-reuse>. Accessed 19 November 2018.
- Arzberger, P., Schroeder, P., Beaulieu, A., Bowker, G., Casey, K., Laaksonen, L., ... Wouters, P. (2004): Promoting access to public research data for scientific, economic and social development. *Data Science Journal*, 3, 1777-78.
- Boaz, A., & Ashby, D. (2003): *Fit for purpose? Assessing research quality for evidence based policy and practice*. London: ESRC UK Centre for Evidence Based Policy and Practice.
- Borgman, C. L. (2012): The conundrum of sharing research data. *Journal of the American Society for Information Science and Technology*, 63(6), 1059–1078. doi:10.1002/asi.22634

- Campus jeunes (2018). *MINESUP: Liste des institutions privés d'enseignement supérieur*. Internet: <http://campusjeunes.net/annonce-1977-minesup-liste-des-institutions-privés-d-enseignement-superieur.html>, accessed 20/11/2018
- Çaparlar, C. Ö. & Dönmez, A. (2016). What is scientific research and how can it be done? *Turk J Anaesthesiol Reanim*, 44, 212-218. DOI: 10.5152/TJAR.2016.34711
- Cragin, M. H., Palmer, C. L., Carlson, J. R., & Witt, M. (2010). Data sharing, small science and institutional repositories. *Philosophical Transactions of the Royal Society of London A: Mathematical, Physical and Engineering Sciences*, 368(1926), 4023–4038. doi:10.1098/rsta.2010.0165
- Crebbin, W. (1997). Defining quality teaching in higher education: An Australian perspective. *Teaching in Higher Education*, 2(1), 21-32, DOI: 10.1080/1356251970020102
- Fouda Ndjodo, M., Ngah, V. B. & Zobo, E. P. (2013). Un profil de compétences pour les professeurs d'informatique de l'enseignement secondaire Camerounais. *International Review of Education*, 59(2), 177–196. <https://doi.org/10.1007/s11159-013-9344-6>
- Guedon, J. C. (2015). Open data and science: Towards optimizing the research process. Internet: <https://www.dataone.org/webinars/open-data-and-science-towards-optimizing-research-process>, accessed 07/03/2019
- Hénard, F. and Roseveare, D. (2012): *Fostering quality teaching in higher education: Policies and practices. An IMHE guide for higher education institutions*. OECD Publishing. Retrieved from: <https://www.oecd.org/education/imhe/QT%20policies%20and%20practices.pdf>. Accessed on 05/02/2019.
- Himmelman, N. P. (1998): Documentary and descriptive linguistics. *Linguistics*, 36(1), 161-196.
- Kahvecia, T. C., Uyguna, Ö., Yurtseverb, U., İlyasb, S. (2012): Quality assurance in higher education institutions using strategic information systems. *Procedia - Social and Behavioral Sciences*, 55, 161–167.
- Kivistö, J. & Pekkola, E. (2017): *Quality in administration of higher education*. Stockholm: Sveriges Universitets- Och Högskoleförbund (SUHF).
- Lohr, K. N. (2004): Rating the strength of scientific evidence: Relevance for quality improvement programs. *International Journal for Quality in Health Care*, 16(1), 9–18.
- Markgraf, B. (2019). *How quality control is done in administration*. Retrieved from <https://smallbusiness.chron.com/quality-control-done-administration-78611.html>. Accessed on 04/02/2019.
- Matei, L. and Iwinska, J. (2016): *Quality assurance in higher education: A practical handbook*. Budapest: Central European University - Yehuda Elkana Center for Higher Education.
- MINESUP (2018): Organisation du ministère de l'enseignement supérieur. Décret n° 2012/433 du 01 octobre 2012.
- MINESUP (2018): *The ministry of higher education*. Retrieved October 20 2018, from <http://www.minesup.gov.cm/>

Ngajie, B. N. & Ngo M. M. C. (2016): Integration of ICTs into the curriculum of Cameroon primary and secondary schools: A review of current status, barriers and proposed strategies for effective integration. *International Journal of Education and Development using Information and Communication Technology (IJEDICT)*, 12(1), 89–106.

OECD (2015): Making open science a reality. *OECD Science, Technology and Industry Policy Papers*, 25. Paris: OECD Publishing. <http://dx.doi.org/10.1787/5jrs2f963zs1-en>

Pokam, H. D. P. (2016): Le financement de l'enseignement supérieur au Cameroun. In L. Ngwé, & H. D. P. Pokam (Eds.), *L'enseignement supérieur au Cameroun depuis la réforme de 1993: Dynamiques et perspectives* (pp. 105–137). Dakar: CODESRIA.

Shavelson, R. J., & Towne, L. (Eds.). (2002): *Scientific research in education*. Washington, DC: National Research Council, National Academy Press.

Shen, Y. (2015): Research data sharing and reuse practices of academic faculty researchers: A study of the Virginia Tech Data landscape. *International Journal of Digital*, 10(2), 157–175.

Thanos, C. (2017). Research data reusability: Conceptual foundations, barriers and enabling technologies. *Publications*, 5(2), 2–19. Doi:10.3390/publications5010002

UKCCIS Evidence Group (2015): *What is good quality research? A guide from the UKCCIS Evidence Group*. Retrieved from: <https://www.saferinternet.org.uk/research/what-good-quality-research>, accessed on 04/02/2019.

University of Buea. (2018): *The research division*. Retrieved November 21st 2018, from <http://www.ubuea.cm/the-research-division/>

University of Reading (2019): *Quality assurance in research.*, Internet: <https://www.reading.ac.uk/internal/academic-and-governance-services/quality-assurance-in-research/reas-RSqar.aspx>, accessed 04/03/2019.

Table of Figures

Fig. 1 The connection between DS&R and QA in HE 96