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Investigating Ways in Which Open Educational Resources and Open Source Software can improve Productivity & Quality in the Health & Social Care Sector in the Island of Mauritius: A Concept Paper

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Abstract. The use of Open Educational Resources (OER) and Open Source Software (OSS) is a recent phenomenon in the Island of Mauritius. Given that education is the key for economic development, it is important to make education accessible to all stakeholders and even more so, it is vital to promote access to education, encourage active participation in education, encourage collaborative educational efforts and promote the use of freely available educational resources and new educational technologies for progress. The concept discussed here is how productivity and quality can drive the use of OER and OSS and how both productivity and quality can be enhanced and better promoted by the use of Open Source resources in different sectors of the Mauritian economy. The focus of this paper is on exploring educational initiatives and OSS applications in the health and social care sector. Useful areas where OER could be applied include undergraduate and postgraduate medical courses as well as continuous professional development for health and social care professionals and OSS could also prove a useful resource in the implementation of E-Health in Mauritius. In conclusion, these free resources have a potential to enhancing productivity in the health & social care sector.

Keywords: Productivity; quality; Open Education Resources; Open Source Software; health and social care; development.

I. Introduction

Mauritius is a small geographically remote island in the Indian Ocean (20^0 17 S, 57^0 33 E). It has a population of 1,274,189 with 70.7% of the population in the 15-64 year old age group and literacy levels of 88.5% [1]. Education is freely provided to the tertiary level in the public sector. The public health care sector provides free health care to the population. In 2011, Mauritius had a Human Development Index of 0.728 and ranked 77th out of 187 countries with comparable data [2].

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Learning for Sharing, Breaking Barriers to Education, Lifelong Learning, Open Source Software (OSS), and Open Educational Resources (OERs) are terms becoming increasingly integrated in the educational landscape nowadays in Mauritius. Open Source Learning Communities and Open Source Curriculum are new ideas being slowly introduced in our educational world. In fact, this move towards Open Source was given impetus in 2002 when the Virtual Centre for Innovative Learning Technologies (VCLIT) at the University of Mauritius became a mirror site of the Massachusetts Institute of Technology- Open Course Ware (MIT-OCW), thus making available the MIT open contents across the campus [3]. At around the same time, Linux groups were emerging in the country to spread the use of Open Source Software and other resources available freely on the internet and there was much interest from participants to join online communities to get access to free knowledge. Mauritius participated in several international conferences to promote the use of OER and OSS. There was a subtle shift in the educational consciousness towards the Open Source movement and a growing understanding of the advantages this may bring in the educational sector. In a speech given by the Minister of Education, Culture and Human Resources of Mauritius at the time, he stated that an important national priority in Mauritius was to increase participation in tertiary education from the present Gross Tertiary Enrolment Rate of 37.3% in 2007 to 72%, by 2015 [4]. Open and Distance learning was seen to be an important key to achieve this desired goal. The Open University of Mauritius Act was passed in recent years prior to the setting up of an Open University which will be operational in the near future.

The National Productivity and Competitiveness Council (NPCC) is an organization set up in 1999 in Mauritius to stimulate and generate productivity and quality consciousness and drive productivity and quality movement in all sectors of the economy with a view to raising national output and to achieving sustained growth and international competitiveness [5]. Based on the premise that Information and Communications Technology (ICT) was found to be the single factor for productivity growth in recent years in the United States of America, NPCC established an ICT programme to gear the whole nation for an ICT culture and promoted the use of ICT as a productivity tool in Mauritius. The NPCC initiated amongst other projects a mass computer proficiency project for primary schools and embarked on the promotion of Open Source Software primarily the Linux operating system in schools and other projects. Other initiatives included workshops on the use of Open Source Software, especially with a view to comparing it economically to commercial copyrighted software. On a productivity perspective, OSS was being advocated to be not only much less costly but vitally for having the potential to encourage creativity and innovation by using collaborative efforts on Open Source resources.

In recent years, with the advent of major developments in the ICT sector in Mauritius, the increasing accessibility of computer ownership, the widespread availability of internet access and the mushrooming of online communities, there has been a greater advocacy for the need to share and collaborate virtually. This is leading to greater accessibility to Open Educational materials and to Open Source Software. More importantly there is an increased awareness by the users of a more open collaborative, creative and empowering type of learning environment that can be harnessed. In addition, there is an additional element of synergy between different types of institutions in Mauritius who are promoting OERs and OSS in the context of

improving productivity and this can in time lead to breakthrough in making the economic success of small countries like Mauritius.

II. Concepts

What are open educational resources?
The definition of OER commonly used is "digitized materials offered freely and openly for educators, students and self-learners to use and reuse for teaching, learning and research". "OER includes learning content, software tools to develop, use and distribute content, and implementation resources such as open licenses" [6].

What is open source software?
OSS is commonly defined as "computer software for which the human-readable source code is made available under a copyright license that meets the Open Source Definition. This permits users to use, change, and improve the software, and to redistribute it in modified or unmodified form. It is very often developed in a public, collaborative manner" [7].

What is productivity?
Productivity is technically defined as Input/output. However, productivity is a broader concept and encompasses more than this technical definition. It is the driving force or dynamism behind the development and the upgrading of the quality of organizational activities. The concept of productivity changes depending on what is expected of organizational activities.

The NPCC adopts the definition of productivity as stated by the European Productivity Agency Rome Conference "The Concept of Productivity and Aims of the National Centres" in 1958.

"Above all else, productivity is an attitude of mind. It is mentality of progress, of the constant improvement of that which exists. It is the certainty of being able to do better today than yesterday, and tomorrow will be better than today. It is the will to improve on the present situation, no matter how good it may seem, no matter how good it may really be. It is the constant adaptation of economic and social life to changing conditions, it is the continual effort to apply new techniques and new methods; it is the faith in human progress."

III. Potential uses of OER and OSS

In the health care sector, health services are provided in Mauritius under the aegis of the Ministry of Health and Quality of Life. Training for medical and allied health care workers is carried out in several educational institutions both locally and internationally at a significant cost. The University of Mauritius offers several courses in the medical and allied health care fields. The educational curriculum in these fields is usually traditional and fairly rigid in terms of teaching methods and materials, methods of delivery and assessment. The time table is fairly inflexible and it is difficult for part-time students to participate. Access to such courses is usually restricted in terms of

numbers. Undergraduate medical education in particular is costly in terms of teaching resources. Recently there have been initiatives to explore the possibility of setting up postgraduate medical courses as well as the provision of continuous medical education and professional development. We believe that OER, Participatory Learning Environments and Open Source Learning Communities can have an important role to play in the setting up of such future postgraduate courses and continuous professional development training programmes and these resources can enhance the course quality as well as lead to cost savings.

Education and training are essential elements in the promotion of productivity and quality in the health and social care. Though face-to-face training tends to be more effective in some cases, the need to go for learning in open learning environments with more emphasis on learner-centered training is becoming a must, especially taking into consideration modern educational thinking. Although most allied health care workers may not have had extensive formal education, especially health promoters and other auxiliary personnel such as dental assistants, midwives, laboratory technicians, equipment maintenance and repair technicians, and pharmacy clerks, they have acquired a wealth of practical experience. They would benefit from a blend of formal and informal training in a participative and socially interactive environment. As regards training in improving productivity (as carried out by the NPCC in different sectors), important tools and techniques of Productivity and Quality like the Value Added, Good housekeeping practices, Kaizen, Process Improvement, Service Excellence, Innovation, Total Quality Management, Green Hospitals, can be more easily explained with interactive examples and case studies. Again an open learning environment would be more appropriate for these mature learners who could be responsible for their own learning and build up on their own experiences or on experiences of their peers. These learners could even exchange their thoughts and ideas internationally and collaboratively come up with new creative proposals to improve productivity. Thus open learning environments offer a richer environment for such learners.

It has to be noted that there have already been small scale successful initiatives to integrate OER in traditional curricula. One example is the adoption and repurposing of quality OERs in selected modules of the BSc (Hons) Medical Science course at the University of Mauritius. The use of reputable free educational resources has enhanced the quality of the course at a low cost. The time factor is also critical as repurposing and local adaptation of course contents is less time consuming than starting from scratch. In addition the medical field lends itself to open learning environments and collaborative learning and makes good use of resources such as multimedia educational tools and learning objects, resources which otherwise would be prohibitive in terms of cost if these had to be purchased. Academics here also feel empowered at having so many free resources freely and readily available. However it has to be said that the extent of this trend remains to be formally assessed and although use of OER seems to be gaining in strength, production of OER is still in the early stages. In a recent survey by the Organization for Economic Co-operation and Development (OECD) to investigate into the use, users and producers of OER, there was only one respondent to the OECD questionnaire from Mauritius [6]. Anecdotally, it appears that OER use is more individual and piecemeal rather than institutional and comprehensive. This seems to tally with other reports which appear to show that the use of OER is still a grassroots phenomenon [6] with little managerial policy guiding this. Given its cost savings and

productivity gains it is perhaps time and need for strong managerial leadership to promote OERs especially in developing countries.

The potential for open source learning communities needs to be explored further in Mauritius. As mentioned earlier, new courses and training programmes especially those involved in continuous professional development could integrate Open Source initiatives. One such training course is the internship training for doctors. This is a two year training programme in hospitals for new doctors before full registration is given by the Medical Council of Mauritius. There have been numerous concerns about the quality of training and there have been numerous complaints in the press about negative experiences suffered by interns which included trainees feeling helpless, isolated and unsupported during their training programmes. As much learning in these two years is informal and experiential learning on the job, the sharing of clinical experiences in a collaborative manner with ongoing peer support and activity driven learning in an open environment as in an open source learning community would be more meaningful, beneficial and empowering. Learners would be empowered as they would be actively participating in their training as opposed to being passive recipients. In addition trainees would be reflecting more on their experiences. However important questions need to be addressed: How to initiate the setting up of such a community? How to sustain it? How to get the right mix of members providing the right mix of motivations? How to choose the right type of technology? How to assess outcomes? [8] Thus the mechanisms behind the setting up of such communities in Mauritius need to be investigated further by looking at examples from other countries to ensure the success of open source learning communities.

OSS is being increasingly used in the country. For example employees at the University of Mauritius are becoming more familiar with such use. Indeed OSS is pre-installed in many of the University's computers which are made available to academics. However the adoption of Open Source Software though initially promising does not appear to have lived up to expectations in many cases. From anecdotal evidence it seems that many users have switched back to proprietary software due mainly to acquired habits and unfamiliarity with OSS. There are other examples of moving away from OSS elsewhere. For example the initial enthusiasm for Linux and its promotion by a core of believers met with resistance from users of proprietary software. The use of Linux in primary schools did not match expected outcomes as most schools returned to proprietary software. Hence this is a challenge for promoters of OSS for although the benefits of OSS appear obvious; users are still reluctant to change their habits of using proprietary software.

E-Health is still in its infancy in Mauritius. However in January 2009, the Government of Mauritius decided to implement a National E-Health Strategic Plan for Mauritius "which involved the use of ICT to improve the work processes of the Ministry of Health and Quality of Life, its departments, as well as health agencies, with emphasis on improving quality and service delivery and made recommendations for appropriate ICT solutions, in terms of suitable hardware, as well as applications, systems software and communication facilities for a more effective and efficient use of IT" [9]. The role of OSS as opposed to proprietary software in this emerging field of E-health still needs to be identified. However the following question is posed: are decision makers in the medical, health and allied health care fields aware of Open

Source resources? It could be argued that the use of OSS is more intuitive in educational/academic environments as those who operate in the educational/academic fields are the natural providers and users of open source materials and resources. Moreover, there are other challenges in the health care sector. In a recent article [10] "What is stalling open source in health care?" the authors argue that two forces are at play: proprietary advantage and bureaucracy. These challenges also exist in Mauritius.

Notwithstanding challenges, appropriate use of OSS could be beneficial. The following case study illustrates this: One of the key difficulties in improving the health and social care system in Mauritius is the lack of an appropriate data collection mechanism. For instance, the following questions are pertinent to decision makers: How many patients are waiting for routine health care every day? How long does a patient need to wait before being examined by a general physician? How long does it take to get an appointment with the specialist? How are complaints being recorded, if any? The fact that all these data are not available today is not because people are lazy and do not want to bother or do not consider it important, it is because the data collection mechanism is not in place. If, for instance, the appropriate OSS was available for all health centres and if these were connected to an open source-based server, data would be readily available on the health status of remote communities instantaneously. In terms of financial cost, this would be much less as compared to the purchase of licensed software. Indeed the investment would be in terms of logistics only and in the training of key staff. In addition, this would allow community participation in the data collection. Another example where open source software would be valuable and indeed transform the way people work is in hospital stock keeping unit. At present, in one of our major hospitals there are computers available in the stock keeping unit where only Excel is used to keep track of stocks. This often results in inefficiency in keeping track of stocks with occasionally the hospital running out of stock of essential items. In this instance, buying appropriate proprietary software and training staff would alleviate matters. However the cost of such proprietary software might be prohibitive and it is indeed cost considerations in developing countries that prevent the adoption of new initiatives and better work practices. In this example, introducing the appropriate OSS with continuous professional development in an open environment would enhance productivity at work and would also encourage worker participation.

As noted previously, Open Source has so many valuable tools and resources to offer in the health care sector, for epidemiology and public health, for pandemic control, for medical research and for electronic health records amongst others. It is important therefore for OSS to acquire greater visibility in the health care sector. The productivity advantages for a small developing country with limited resources in terms of resources and cost savings is huge.

IV. Conclusion

This paper explores some examples of current and potential open educational initiatives and OSS applications in the health and social care sector in Mauritius. We discuss the concepts of productivity and quality as related to Open Source and these can be viewed both as drivers and products of OER and OSS in our country. OER and OSS are

valuable resources which should be harnessed and put to productive use. This aspect needs to be further emphasized, especially in the developing world, to encourage people to participate more in such initiatives.

References

[1] Central Intelligence Agency, 2012. The World Fact book, Mauritius.
Available from: https://www.cia.gov/library/publications/the-world-factbook/geos/mp.html

[2] UNDP, 2012, Human Development Reports 2011.
Available from: http://hdrstats.undp.org/en/countries/profiles/MUS.html

[3] Senteni, A, 2012, The Open Educational Resources (OER) Initiative.
Available from: http://edutechwiki.unige.ch/en/Open_educational_resources

[4] Bunwaree, VK, 2008, Address by Hon Dr V.K. Bunwaree, Minister of Education, Culture & Human Resources at Capacity Building Workshop for ODL Practitioners, Organised by the WGDEOL.
Available from: www.adeanet.org/adeaPortal/adea/wgdeol/cbworkshop2008/OpeningMINISTER.doc

[5] NPCC, 2012.The National Productivity and Competitiveness Council Act, 1999.
Available from: http://www.npccmauritius.com/index.php/our-servcices/54-npcc-act/44-npcc-act

[6] Organization for economic co-operation and development, 2007, Giving knowledge for free: the emergence of open educational resources. Centre for Educational Research and Innovation.
Available from: http://www.oecd.org/dataoecd/35/7/38654317.pdf

[7] Wikipedia, 2012. Open Source Software.
Available from: http://en.wikipedia.org/wiki/Open_source_software

[8] Meiszner A, Glott R, Sowe SK, 2008, Free / Libre Open Source Software (FLOSS) Communities as an Example of Successful Open Participatory Learning Ecosystems, UPGRADE, The European Journal for the Informatics Professional. 9(3), 62-68.

[9] Republic of Mauritius, 2012. Cabinet decisions 23 January 2009.
Available from:
http://www.gov.mu/portal/site/pmosite?content_id=124ba622c022f110VgnVCM1000000a04a8c0RCRD

[10] Blakenhorn, D, 2007. What is stalling open source in health care?
Available from: http://blogs.zdnet.com/open-source/?p=1272