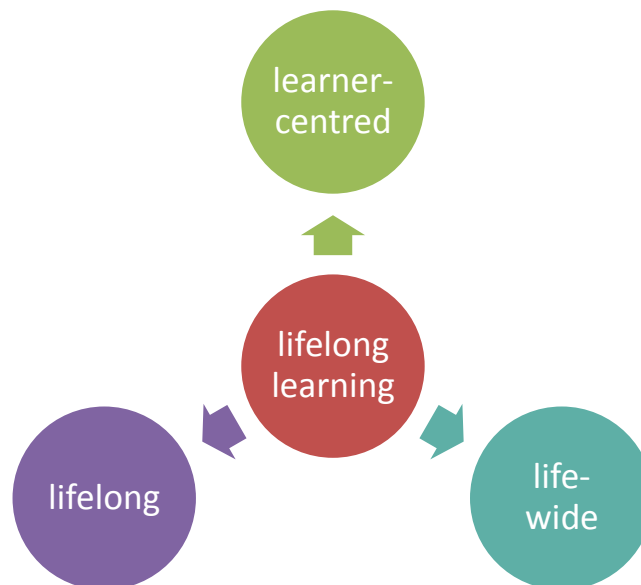




Building-up Human Capital in Senegal- E-Learning for School-drop outs Possibilities of a Lifelong Learning Vision

Sissi Eklun-Natey², Karsten Sohns³ und Michael H. Breitner⁴



¹ Kopien oder eine PDF-Datei sind auf Anfrage erhältlich: Institut für Wirtschaftsinformatik, Leibniz Universität Hannover, Königsworther Platz 1, 30167 Hannover (www.iwi.uni-hannover.de).

² Sissi Eklun-Natey (eklu-natey@iwi.uni-hannover.de).

³ Diplom-Ökonom, wissenschaftlicher Mitarbeiter und Doktorand (sohns@IWI.uni-hannover.de).

⁴ Professor für Wirtschaftsinformatik und Betriebswirtschaftslehre und Direktor des Instituts für Wirtschaftsinformatik der Leibniz Universität Hannover (breitner@iwi.uni-hannover.de).

Content

1	Introduction	3
2	Features of the Senegalese labor market	5
3	Reasons for the humble investment of the Senegalese labor force in education.....	7
3.1	The dual (labor) market in Senegal and its influence on the human capital.....	8
3.1.1	Attributes of the informal sector	8
3.1.2	Attributes of the formal sector	10
3.1.3	The influence of the dual labor market on the investment of the Senegalese population in Human Capital.....	11
3.2	The influence of the high poverty on the investment of the Senegalese population in Human Capital.....	15
3.3	The influence of information asymmetries on the investments in Human Capital	16
4	A Lifelong learning visions - an opportunity for Senegal.....	19
4.1	E-Learning—the application of a Lifelong Learning Vision	21
4.1.2	The competencies needed to act in the global knowledge based-economy.....	23
4.1.3	Features of the Senegalese E-Learning-user and his influence on the E-Learning concept.....	23
5	The E-Learning Resources in Senegal	28
5.1	The material and technology for the E-Learning project.....	28
5.2	Human Resources for the E-Learning project	31
5.3	The cost of E-Learning for school drop-outs	33
6	Mobile-Learning – a promising branch of E-Learning.....	34
7	Conclusion	36
8	Bibliography	38

Figures

Figure 1:	Primary completion rate.....	5
Figure 2:	Size of enterprises in the formal and informal sector	9
Figure 3:	The weight of the ancillary labor costs of formal Sector workers in Senegal can only be compared to France	10
Figure 4:	Formation needs (expressed by employers in Senegal)	17
Figure 5:	Components of Lifelong Learning	19
Figure 6:	Requirements to a lifelong learning concept.....	20
Figure 7:	The Relationship between E-Learning and Lifelong Learning	22
Figure 8:	Client-Server-Architecture	29
Figure 9:	Peer-to-peer-systems	30
Figure 10:	Mobile-Learning as part of E-Learning	34

Tables

Table 1:	Evolution of the active occupied population per sector of activity from 1995 to 2004.....	12
Table 2:	Characteristics of the qualification of labor in Dakar.....	12
Table 3:	Monthly wage per worker (mean value in thousands of FCFA).....	14
Table 4:	ICT Architecture, infrastructure and costs per scenario.....	31
Table 5:	Human capital cost for each E-Learning-scenario	32

1 Introduction

In today's knowledge based economy innovativeness, education and the ability to update knowledge are the main drivers of economic growth. In corollary the only way for developing countries to reduce poverty and enhance economic growth is to rebuild their human capital. And the best mean to do so is the adoption of a lifelong learning vision and the use of modern ICT.



Source: Wikipedia; <http://de.wikipedia.org/wiki/Senegal>;
latest call: 20.09.2009

As will be shown in this discussion paper, this especially holds for Senegal, the republic in the very west of the African continent. Poor in natural resources the future of the Sahel-county is largely determined by its ability to create labor with high value added.⁵ Even though Senegal, since its independence in 1960, ranks amongst all African states as one of the most politically stable countries, it has to deal with the typical problems of most sub-Saharan countries. With a Human Development Index of 0.502 (which gives the country a rank of 153rd out of 179 countries)⁶, a GDP of only 820\$ per capita⁷ and an employment rate of 54%⁸ Senegal is one of the poorest countries in the world.

Especially when it comes to the educational system, the former French colony struggles with the marks of its colonial past. Only 49,12%⁹ of the population is literate with high gender disparities and differences between rural and urban regions. As in most French speaking African countries this is partly due to the adaptation of the French formal educational system. Despite French being the language Senegalese students are taught

⁵ World Bank (2007); p.9-10

⁶ UNDP (2009)

⁷ World Bank (2009b)

⁸ World Bank (2009d); Employment to population ratio, ages 15-24, total (%)

⁹ World Bank (2009a)

in, roughly 25% of the ethnically, culturally, and linguistically very diverse¹⁰ population is “capable of using French as a language through which...” it has “...access to information, whether it be written or oral”.¹¹ Although various reforms after the independency of Senegal were striving to decentralize and to open up to the private sector, the system is still too rigid to respond to the needs of the Senegalese labor market: The majority of the Senegalese student’s drops out of the formal educational system in the first years of schooling without any major certificate. And the Senegalese government has not yet created a strong net to absorb those losses to the labor market. However, the market reacted with the supply of various courses for school drop outs. But these schools most of the time lack in the necessary quality.¹²

In the following will be shown that the implementation of a lifelong learning vision could help Senegal to break the vicious cycle of low knowledge and education, low economic prosperity and the high vulnerability to poverty of the population. E-Learning, among experts, has become the major tool to realize this vision as it embodies the new media’s and possibilities forming today’s economy. This discussion paper will give a broad analyze about the actual situation in Senegal, the needs of the labor market, school drop outs as targeted group and the resources on hand to realize a e-Learning program for school drop outs.

The structure of this paper follows this line of argument. The next chapter will start with the features of the Senegalese labor market and the educational status of the population, which will give an introduction to the second chapter. Chapter three gives an explanation for the weak investment of the Senegalese population in education and will answer to the question why an e-Learning program should address school drop outs. In the fourth chapter will be analyzed why a lifelong learning vision could help Senegal to free himself out of its economic isolation and which features of the targeted group creates the adequacy of e-Learning. Chapter five will give an overview over the technology relevant in the Senegalese context and the cost structure of the relevant resources. The seventh chapter will give a short overview of the relevance of mobile learning for the Senegalese context and the last chapter will conclude.

¹⁰ World Fact book (2009): 7 main different ethnic groups (Wolof 43.3%, Pular 23.8%, Serer 14.7%, Jola 3.7%, Mandinka 3%, Soninke 1.1%, European and Lebanese 1%, other 9.4%) and 5 different languages spoken (French (official), Wolof, Pulaar, Jola, Mandinka); 94% of the population are Muslim, 5% Christian an 1% follow indigenous beliefs

¹¹ Kuenzi (2006); p 211

¹² Atchoarena (2006); p. 108- 113

7 Conclusion

The beginning of the paper showed the high need of Senegal to develop its human capital in order to become more competitive on a global scale. The main way to do so is to address the biggest lack in the Senegalese educational system: the high productivity losses to the labor market due to the high school drop-out rate. In order to adequately address the target group the reasons for the humble investment of a high share of the population was analyzed. The result was that the informal sector with its easy access, the high vulnerability to poverty and the significant information asymmetries restrict the investment of the population in education. If one decides to motivate this targeted group with further education these features have to be incorporated into the project adequately.

The paper illustrated that the adoption of a lifelong learning system allows a smoothening of the very rigid educational system in Senegal. The adoption of a lifelong learning vision allows an easier access to education and higher adaption of the learning process to the individual needs, thus everything that Senegal needs in order to address people who dropped out of the school system.

Further was shown that E-Learning is the most adequate tool to adapt such a lifelong learning vision as it is able to incorporate all the requirements of a lifelong learning vision. But before the launch of the E-Learning project the adequacy of this tool has to be analyzed.

The discussion paper pointed out, that special features of the Senegalese school-drop out have to be incorporated in order to fit the program to her or his personalized needs and how the available resources restrict or enhance the architecture and the possibilities of E-Learning.

A detailed analyzes of the resources and costs made apparent that the cooperation with educational institutions may be the most interesting solution for the start of such a project. Especially, as this scenario seems to be the most fertile to the technical possibilities, the costs and the scientific exchange in order to localize the program.

All in all, one can say that the adoption of such an E-Learning project is a huge opportunity for Senegal. What most of the sub-Saharan countries understood till now is, that the implementation of E-Learning projects in their countries may be a tool to reduce the overall divide between the western countries. That means the digital, scientific and social divide between developing and developed countries.

The adoption of a lifelong learning vision would mean for the sub-Saharan countries to use their weaknesses and turn them into their strength.

To recognize how much, human capital wise, Senegal lacks behind the developed world and to see in this weakness the opportunity to establish a whole new learning-vision that is much smoother and adapted to the requirements of today's knowledge-based economy would be a great strength for Senegal in the future. Especially if one takes to account that still the developed countries struggle with the adoption of a lifelong learning vision because of the rigidity of many institutions.

That also introduces why the governmental support is so important for the project. If the government shows the flexibility to respond to the new demand in terms of education

and readjusts its educational system in order to adapt a more universal validation of knowledge, the holistic implementation of the project could be reached.

Closing, one can say that the pilot of a project addressing school drop-outs could be a very meaningful step for Senegal. Especially, this would be the case, when collaborations with important educational institutions could be established. In order to start the project more profound technical, pedagogical, and economic studies have to be done in order to set up a good project management. If all these steps are respected the project could be a promising opportunity for Senegal.

8 Bibliography

Agence National de la Statistique et de la Démographie (2009): Agence Nationale de la Statistique et de la Démographie ; <http://www.ansd.sn/>; latest call : 01.05.2009

Atchorena (2006): Atchoarena, D.; Delluc, A.-M.; Revisiting technical and vocational education in sub-Saharan Africa; an update on trends innovations and challenges; June 2006

Brown (2003): Brown, T.-H.; The role of m-learning in the future of e-learning in Africa; University of Pretoria; 2003

Blunch (2001): World Bank ; Blunch, N.-H. ; Canagarajah, S. ; Raju; The Informal Sector Revisited: A Synthesis Across Space and Time; July 2001; Discussion Paper NO.0119

Canagarajah (2001): World Bank; Canagarajah, S.; Sethuraman, S.V.; Social Protection and the Informal Sector in Developing Countries: Challenges and Opportunities; December 2001

Conference Internationale du Travail (2002) : Conférence internationale du Travail; Travail décent et économie informelle ;2002

Hepp (2004): Hepp, P.-K.; Hinostroza, E.-S.; Laval, E.-M.; Rehbein, L.-F.; Technology in Schools: Education, ICT and the Knowledge Society; October 2004

Hofstede (2001): Hofstede, G.; Cultures consequences. Comparing values, behaviors, and organizations across nations 2nd edn; Sage; Thousand Oaks; 2001

Kohn (2008): Kohn, T.; Maier, R.; Thalmann, S.: Knowledge Transfer with E-Learning Resources to Developing Countries - Barriers and Adaptive Solutions. Proceedings of *MKWI 2008*. München, Germany, Springer; 2008

Kuenzi (2008): Kuenzi, M.; Non-formal education and community development in Senegal,; Community Development Journal Vol 41 No 2 April 2006
Kuhlmann, A.-M.; Sauter, W.; Innovative Lernsysteme; Springer; 2008

Levenson (1998): World Bank ; Levenson , A. R.; Maloney, W. F.; The Informal Sector, Firm Dynamics, and Institutional Participation; September 1998

Loayza (1997): World Bank ; Loayza, N. V.; The Economics of the Informal Sector, A Simple Model and Some Empirical Evidence from Latin America; February 1997; p. 1

Meier (2006): Meier, R.; Praxis E-Learning; Gabal Professional Training; 2006

Ndiaye (2006): Ndiaye, M.; Partnerships in the Education System; Policy Dialogue and Education: African Experiences; Prospects vol. XXXVI; no. 2; June 2006

Niegemann (2008): Niegemann, H.-M.; Dmagk, S.; Hessel, S.; Hein, A.; Hupfer, M.; Zobel, A.; Kompendium multimediales Lernen; Springer; 2008

Nielsen (1993): Nielsen, J.; Usability engineering; Chesnut Hill: Academic Press, Inc.; 1993

Oosterbeek (2008): Oosterbeek, H.; Patrinos, H.-A.; Financing Lifelong Learning; March 2008

Organisation Internationale du Travail (2009): Organisation Internationale du Travail (OIT)/Wikipédia : secteur informel au Sénégal ; http://fr.wikipedia.org/wiki/Secteur_informel_au_S%C3%A9n%C3%A9gal; latest call : 20.06.2009

Pawlowski (2009): Pawlowski, J.-M.; Richter, T; A Methodology to Compare and Adapt E-Learning in the Global Context; Korean German Institute of Technology. Breitner, M. H. et al. In: E-Learning 2010, Springer, Berlin 2009

Pechar (2006): Pechar, H.; Bildungsökonomie und Bildungspolitik; 2006

Schuetze (2007): Schuetze, H.-G.; Individual Learning Accounts and other models of financing lifelong learning; International Journal of Lifelong Education; 2007

UNESCO (2009): UNESCO Institute for Statistics; <http://hdr.undp.org/en/statistics/>; latest call: 01.05.2009

UNDP (2009): UNDP; Human Development Reports

World Bank (2009a): World Bank; Education Statistics; Education Statistics; <http://go.worldbank.org/ITABCOGIV1>; latest call: 20.06.2009

World Bank (2003): World Bank; Lifelong Learning in the Global Knowledge Economy: Challenges for Developing Countries; 2003

World Bank (2007): World Bank; Sénégal-A la Recherche de l'Emploi- Le Chemin vers la Prospérité ; Mémoire Économique sur le Pays ; Septembre 2007

World Bank (2005): World Bank; Sénégal - Une évaluation du climat des investissements; p.52 ; Mars 2005

World Bank (2009b): World Bank; Senegal at a glance; http://devdata.worldbank.org/AAG/sen_aag.pdf; latest call: 20.06.2009

World Bank (2009c): World Bank; Senegal; ICT at a Glance; http://devdata.worldbank.org/AAG/sen_aag.pdf; latest call: 20.06.2009

World Bank (2009d); World Bank; Senegal-Millennium Development Goals; http://ddp-ext.worldbank.org/ext/ddpreports/ViewSharedReport?&CF=&REPORT_ID=1305&REQUEST_TYPE=VIEWADVANCED; latest call: 20.06.2009

World Bank (2009e): World Bank; Senegal Slideshow ; <http://digitalmedia.worldbank.org/slideshows/senegal-fr/>; latest call: 20.06.2009

World Fact Book (2009): World Fact Book; www.cia.gov/library/publications/the-world-factbook/; latest call: 01.05.2009

www.xlingua.de (2009): latest call: 20.06.09

www.elearning-africa.com (2009): www.elearning-africa.com; e-learning in Afrika: 'Der Bedarf an Bildung ist enorm'; News e-le@rning; 21.10.2005; latest call: 20.06.2009

IWI Discussion Paper Series/Diskussionsbeiträge

ISSN 1612-3646

Michael H. Breitner, *Rufus Philip Isaacs and the Early Years of Differential Games*, 36 p., #1, January 22, 2003.

Gabriela Hoppe and Michael H. Breitner, *Classification and Sustainability Analysis of e-Learning Applications*, 26 p., #2, February 13, 2003.

Tobias Brüggemann und Michael H. Breitner, *Preisvergleichsdienste: Alternative Konzepte und Geschäftsmodelle*, 22 S., #3, 14. Februar, 2003.

Patrick Bartels and Michael H. Breitner, *Automatic Extraction of Derivative Prices from Webpages using a Software Agent*, 32 p., #4, May 20, 2003.

Michael H. Breitner and Oliver Kubertin, *WARRANT-PRO-2: A GUI-Software for Easy Evaluation, Design and Visualization of European Double-Barrier Options*, 35 p., #5, September 12, 2003.

Dorothee Bott, Gabriela Hoppe und Michael H. Breitner, *Nutzenanalyse im Rahmen der Evaluation von E-Learning Szenarien*, 14 S., #6, 21. Oktober, 2003.

Gabriela Hoppe and Michael H. Breitner, *Sustainable Business Models for E-Learning*, 20 p., #7, January 5, 2004.

Heiko Genath, Tobias Brüggemann und Michael H. Breitner, *Preisvergleichsdienste im internationalen Vergleich*, 40 S., #8, 21. Juni, 2004.

Dennis Bode und Michael H. Breitner, *Neues digitales BOS-Netz für Deutschland: Analyse der Probleme und mögliche Betriebskonzepte*, 21 S., #9, 5. Juli, 2004.

Caroline Neufert und Michael H. Breitner, *Mit Zertifizierungen in eine sicherere Informationsgesellschaft*, 19 S., #10, 5. Juli, 2004.

Marcel Heese, Günter Wohlers and Michael H. Breitner, *Privacy Protection against RFID Spying: Challenges and Countermeasures*, 22 p., #11, July 5, 2004.

Liina Stotz, Gabriela Hoppe und Michael H. Breitner, *Interaktives Mobile(M)-Learning auf kleinen End-geräten wie PDAs und Smartphones*, 31 S., #12, 18. August, 2004.

Frank Köller und Michael H. Breitner, *Optimierung von Warteschlangensystemen in Call Centern auf Basis von Kennzahlenapproximationen*, 24 S., #13, 10. Januar, 2005.

Phillip Maske, Patrick Bartels and Michael H. Breitner, *Interactive M(obile)-Learning with UbiLearn 0.2*, 21 p., #14, April 20, 2005.

Robert Pomes and Michael H. Breitner, *Strategic Management of Information Security in State-run Organizations*, 18 p., #15, May 5, 2005.

Simon König, Frank Köller and Michael H. Breitner, *FAUN 1.1 User Manual*, 134 p., #16, August 4, 2005.

Christian von Spreckelsen, Patrick Bartels und Michael H. Breitner, *Geschäftsprozessorientierte Analyse und Bewertung der Potentiale des Nomadic Computing*, 38 S., #17, 14. Dezember, 2006.

Stefan Hoyer, Robert Pomes, Günter Wohlers und Michael H. Breitner, *Kritische Erfolgsfaktoren für ein Computer Emergency Response Team (CERT) am Beispiel CERT-Niedersachsen*, 56 S., #18, 14. Dezember, 2006.

Christian Zietz, Karsten Sohns und Michael H. Breitner, *Konvergenz von Lern-, Wissens- und Personalmanagementssystemen: Anforderungen an Instrumente für integrierte Systeme*, 15 S., #19, 14. Dezember, 2006.

Christian Zietz und Michael H. Breitner, *Expertenbefragung „Portalbasiertes Wissensmanagement“: Ausgewählte Ergebnisse*, 30 S., #20, 5. Februar, 2008.

IWI Discussion Paper Series/Diskussionsbeiträge

ISSN 1612-3646

Harald Schömburg und Michael H. Breitner, *Elektronische Rechnungsstellung: Prozesse, Einsparpotentiale und kritische Erfolgsfaktoren*, 36 S., #21, 5. Februar, 2008.

Halyna Zakhariya, Frank Köller und Michael H. Breitner, *Personaleinsatzplanung im Echtzeitbetrieb in Call Centern mit Künstlichen Neuronalen Netzen*, 35 S., #22, 5. Februar, 2008.

Jörg Uffen, Robert Pomes, Claudia M. König und Michael H. Breitner, *Entwicklung von Security Awareness Konzepten unter Berücksichtigung ausgewählter Menschenbilder*, 14 S., #23, 5. Mai, 2008.

Johanna Mählmann, Michael H. Breitner und Klaus-Werner Hartmann, *Konzept eines Centers der Informationslogistik im Kontext der Industrialisierung von Finanzdienstleistungen*, 19 S., #24, 5. Mai, 2008.

Jon Sprenger, Christian Zietz und Michael H. Breitner, *Kritische Erfolgsfaktoren für die Einführung und Nutzung von Portalen zum Wissensmanagement*, 44 S., #25, 20. August, 2008.

Finn Breuer und Michael H. Breitner, *„Aufzeichnung und Podcasting akademischer Veranstaltungen in der Region D-A-CH“: Ausgewählte Ergebnisse und Benchmark einer Expertenbefragung*, 30 S. #26, 21. August, 2008.

Harald Schömburg, Gerrit Hoppen und Michael H. Breitner, *Expertenbefragung zur Rechnungseingangsbearbeitung: Status quo und Akzeptanz der elektronischen Rechnung*, 40 S., #27, 15. Oktober 2008

Hans-Jörg von Mettenheim, Matthias Paul und Michael H. Breitner, *Akzeptanz von Sicherheitsmaßnahmen: Modellierung, Numerische Simulation und Optimierung*, 30 S., #28, 16. Oktober 2008

Markus Neumann, Bernd Hohler und Michael H. Breitner, *Bestimmung der IT-Effektivität und IT-Effizienz serviceorientierten IT-Managements*, 20 S., #29, 30. November 2008

Matthias Kehlenbeck und Michael H. Breitner, *Strukturierte Literaturrecherche und -klassifizierung zu den Forschungsgebieten Business Intelligence und Data Warehousing*, 10 S. #30, 19. Dezember 2009

Matthias Kehlenbeck, Marc Klages, Harald Schömburg, Jon Sprenger, Jos Töller, Halyna Zakhariya und Michael H. Breitner, *Aspekte der Wirtschaftsinformatikforschung 2008*, 128 S., #31, 12. Februar 2009

Sebastian Schmidt, Hans-Jörg v. Mettenheim und Michael H. Breitner, *Entwicklung des Hannoveraner Referenzmodells für Sicherheit und Evaluation an Fallbeispielen*, 30 S., #32, 18. Februar 2009

