Information Management, Digital Literacy Skills and Attitude: A Recipe for Information Technology Adoption by Librarians in Nigeria

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Abstract

This study investigated the level of information technology adoption and the impact of information management, digital literacy and attitude on the information technology adoption by librarians in academic libraries, Nigeria. The study adopted a descriptive survey with a questionnaire as data collection instrument. The population comprised all librarians from six federal universities in Northeast, Nigeria. A sample of 376 respondents was drawn through a simple enumeration method of sampling. The research question was analysed descriptively while the null hypotheses were analysed by structural equation modelling with smartpls version 3. The results revealed that the level of IT adoption by the librarians was high. Further results revealed that there was a significant impact of information management skills, and digital literacy skills on information technology adoption. On the contrary, attitude failed to pose significant impact on information technology adoption while digital literacy skills had a significant impact on information management skills. Recommendations were made based on the research outcome.

Keywords: Information Management, Digital Literacy Skills, Attitude Information Technology Adoption

Introduction

Modern society is distinguished by the accelerated growth of information technology (IT), which has resulted in a high reliance on an individual's understanding and abilities in the field of information technology. And the library as a social organisation has been invaded by IT applications so much that any library without an IT presence is regarded as no-existence.

Information technology encompasses all aspects of innovation that work "with information, whether in an information system, the automation of an industrial process, organisational communications through computers, or individual computer uses. IT is a technology that uses computers to collect, process, store, protect, and transfer information (ITdesk.info, nd). Information technology is often used interchangeably with information and communication technology due to the similarity that exists among them.

Global best practice in the field of librarianship, occasioned by the increase in the deployment of information technology in the library has caused inestimable changes in most library services and operations. It is no longer strange that information technology has created a niche in the way libraries are managed; this has kept the librarians on red alert, not on skill upgrade only but attitude refinement. Therefore, the adoption of a positive attitude towards Information technology is a prerequisite to the development of information management and digital literacy skills and the
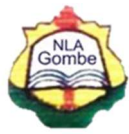
adoption of IT in the academic libraries. Information in various types such as hardware technology, information systems, specific automation resources, multimedia resources etc., have brought great improvement in academic library services.

Libraries in advanced nations have evolved significantly from manual service delivery to systems to the adoption of dynamic technological advanced mechanisms such as SMT (Akintunde, 2004). Kai-Wah Chu and Du (2012), believe that SMT use in academic libraries is preferred in Asia, North America, and Europe. According to Cordova and Vecchione (2011), the prevalence of SMT has transformed academic librarians in advanced nations and has a profound impact on their user's service quality. Likewise, McCallum (2015) claims that SMT has given academic librarians in the UK, India, and the United States the advantage to provide library services in virtual spaces, strengthen the relationship "between the library and" the users, provide real-time user service, and improve assets and awareness for the libraries. Besides that, SMT use encourages joint collection development, suited to particular user groups, boosts Librarians' virtual accessibility for improved teamwork and optimised research output. The 4IR has provided enormous benefits (Frederick, 2016: 10), and the academic libraries have used that as an opportunity to create new technologies to provide further effective and convenient services. As Web 2.0 technologies gain popularity and increase (Harinarayana & Raju, 2010: 77), academic libraries have been quick to begin 'liking,' tweeting, and forming social connections on several platforms (Hicks, 2012: 190).

To remain relevant in the information age, a paradigm shift from manual library operation to ICT-driven library services has been advanced (Adeleke & Olorunsola, 2010; Odero-Musakali & Mutula, 2007). Thus, McCallum (McCallum, 2015) asserts that academic librarians in the developed nations have identified with SMT, and the author recommends that developing nations also must follow suit. Therefore, the understanding of factors such as information management and digital literacy skills, and attitude adoption by the academic librarians become necessary, and this is the gap the present study aims to cover.

Information management skills comprise the competencies and efficacy to control and use information in various formats to improve the organisations. It relies on the creation and dissemination of appropriate information to various categories of users. Digital literacy skills are very vital in the present-day library and information services. It is the ability to "locate, consume, create and communicate digital content" (Spires & Bartlett, 2012). Attitude is a psychological factor, which shapes someone's opinion about an object, system or person. It relates to the librarian's feelings and perceptions about the use of information technology in the library. Studies have highlighted the role of attitude in technology acceptance (Clifford, & Zaccus, 2015; Alharthi, 2019; Madu, Haruna, & Rajapakse, 2019). Hence, it becomes important to understand the contribution of these factors to IT Adoption by Librarians in Nigeria.

Statement of the Problem
In recent times, Information technology has created vital opportunities for libraries to excel in various operations. Application of IT has become the index to library service quality, as any recent development brings the innovation of services and products. However, the opportunities created by information technology have not been fully utilized by most libraries in the under-developed countries including Nigeria. Even though the Web 2.0 form of information technology has the potential to improve library service delivery at little to no cost, many academic libraries have been slow to adopt it (Lwoga 2012; Boateng 2014). Observations show that most academic librarians in Nigeria have developed a negative attitude towards Information technology used for personal
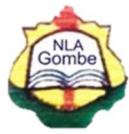
and library services. The reason cannot be far-fetched as they are bedevilled by many factors. One of which is the skills requirement according to

Chinwe Anyanwu, Oha and Benard (2011) posit that the use of "information and communication technology for library services" needs a computer literate librarian and highly skilled who can combine both IT and manual related services to manage complex situations. Librarians in most Nigerian academic libraries are yet to develop the right attitude towards technology. A library is valued in certain emerging economies as "someplace to store books" instead of being the primary aspect of educational and technical activities. Consequently, a sizable sector of the population and policy makers in emerging nations are unaware of the crucial role that a contemporary academic library could play in the country's economic growth (Chisenga, 2004). Librarians in most academic libraries have not prioritized information management; this is justified by the resistance to change from manual information organisation. This study aimed to unveil the impacts of information management, digital literacy and attitude to IT adoption by librarians in Nigeria.

Objectives of the study
The focus of this study is to investigate the factors for Information technology adoption among librarians in Nigeria. The specific objectives are to determine:

1. The level of Librarians' IT adoption in the academic Library in Nigeria
2. The impact of Librarians' information management skills on IT adoption in the academic Library in Nigeria
3. The impact of Librarians' digital literacy skills on IT adoption in the academic Library in Nigeria
4. The impact of Librarians' attitude towards IT adoption in the academic Library in Nigeria
5. The impact of digital literacy skills on information management skills of the librarians in the academic Library in Nigeria.

5. Research hypotheses
Ho1: There is no significant impact of librarians' information management skills on IT adoption in the academic libraries in Nigeria

Ho2: There is no significant impact of Librarians' digital literacy skills on IT adoption in the academic libraries in Nigeria

Ho3: There is no significant impact of Librarians' attitude toward IT adoption in the academic Library in Nigeria

Ho4: Digital literacy skills have no significant impact on the information management skills of librarians.

Review of Related Literature
Librarian's Information Management Skills and Information Technology adoption in the Academic Library

Information Management (IM) is often referred to as knowledge management in literature (Song, Buba, & Gindau, 2017; Ugwu & Ekere, 2019) which relates to the competence in the overall information business. The IM skills, therefore, are the capabilities to handle information from creation to consumption and further uses. The skills to manage information is a vital aspect of the job description of the librarian and information professionals. And without this, there will be a dearth of ICT experts in the EU by 2020 (Hüsing, Korte, & Dashja, 2016), and an early stage of
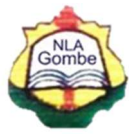
data transformation will suffer drawbacks (Kolding, Sundblad & Alexa, 2018). Information management skills are one of the benefits of education in librarianship. Hence, the design and deployment "of a master's degree in information management" addressed the "need to better utilise the skill set on" overcoming obstacles (Gorman & Corbitt, 2002), especially on the job. The authors argue that the key dimensions of an information management programme should be connected to "library information science and information system" management. Changing landscape of librarianship requires the librarian to update their "improve the information management and data computing skills" (Rifaudeen, 2015). A view from the information management perspective according to Sharma (2019) indicates that skills are beneficial in assisting practitioners to internalize relevant information as well as to enable the composite method of information processing. Reddy and Jyothy, (2014) analysed each cycle of information management skills of the librarian in the digital era. According to them, each cycle of IM highlights the value of information in the library and updates the roles of the information professionals, librarians etc. The role of information management skills cannot be overemphasized in quality library services, studies (Gorman & Corbitt, 2002; Arua & Ukwuaba, 2016) have emphasized the need for information management and computing skills upgrade by the librarians. According to (Arua & Ukwuaba, 2016), information management skills are essential for effective library and information resources management as well as quality services to meet the patron's present and future needs at all times. Unfortunately, most people fail to understand that every new information system or technology places emerging needs on their skills, and as such, they are passive (Arua & Ukwuaba, 2016).

Librarians' Digital Literacy Skills and Information Technology adoption in the Academic Library

The development of the digital era in libraries necessitated the computerization of the majority of activities. According to Anuradha (2017), contemporary technologies have dramatically altered how libraries operate in the knowledge economy. Acquisition of the relevant digital skills becomes the prelude to adoption and use of the digital resources in the libraries, without which results in low utilization and no appropriation of the benefits of the technology (Olijo, 2018). Regarded in literature as digital competence (Cartelli, 2010), e-skill (European Commission, 2003) and digital capacities (Jisc, 2014), Emiri (2015) previewed digital literacy skills as a beneficiary to experts from various specialities in their daily tasks.

Ogochukwu (2015) conducted a study to examine library professionals' digital literacy skills through descriptive survey research. Six research questions and one hypothesis were used to examine library professionals from some universities in Edo state. Results of the study indicate that the professionals are competent in social networking, use of PDAs, electronic mailing, Internet surfing and mobile phone, however, the digital literacy level was low according to the study. Bhatti and Nadeem (2014) revealed that almost all academic librarians wanted to be proficient in the use of social media, the Web, and internet activities. To remain effective in the digital environment and face the demands of digital librarianship, librarians must learn new skills. According to Choi and Rasmussen (2006), librarians must be capable to create and manage digital libraries, creating metadata and preserving information, able to manage digital contents, and proficient in the operation of "scanners, imaging skills, and assigning optical character recognition (OCR) records". Which is a significant job description for a digital librarian in academic libraries (Choi & Rasmussen, 2009). Martzoukou and Elliott (2016) and Hamad, Al-Fadel and Fakhouri (2020)
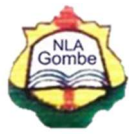
disclosed a set of digital skills deemed significant by librarians. They are the "advancement of information technology (IT) skills" as well as the use of various "communication media and tools such as e-books, online databases, and social media platforms". In line with this, Tiemo (2019) stated that academic librarians in Nigeria have a high level of digital technology skills to manage digital tools for efficient library services. Yet they to need additional training in "digital technology skills to manage and improve their online resources and services". The findings of Baro et al. (2019) confirmed that academic librarians in Africa libraries have significant proficiency using digital tools. According to librarians, Digital skills like "database search skills, uploading documents to online platforms, etc., as well as the ability to use open-source software, are very high"

In a study of digital skills and knowledge competencies among librarians in the university library, Okeji et al., (2019) studies 111 librarians through an online questionnaire   Overall, the survey found that approximately half of the librarians regarded "their level of digital literacy as moderate. Only a few librarians considered their digital literacy to be excellent."

Librarians' Attitude and Information Technology adoption in the Academic Library

Described as "a mental state conscious or unconscious; a value, belief, or feeling; and a predisposition to behaviour or action (Altmann, 2008), attitude is a psychological trait in a human which determines his or her emotion towards an object, system or fellow human being. It plays a significant role in human behaviour and relationship. Attitude has played a predictive, moderator and mediating role in several libraries and information science studies (Ejedafiru & Lucky, 2003; Adekunle Omoba, & Tella, 2007; Achugbue, & Anie, 2011; Madu & Dawha, 2019). In a descriptive study of the attitude of 41 selected librarians from university libraries in Oyo State, Nigeria, Adekunle Omoba, & Tella, (2007) adapted "Igberia and Chakrabarti (1990) Computer Anxiety and Attitude towards Microcomputer Utilization (CAATMU) scale and Librarian attitude questionnaire developed by Ramzan (2004)'. The results indicate among others that Librarians from the selected university libraries have a positive attitude towards ICT. Further, on whether "ICT training or librarian knowledge of ICT influences their attitude towards the use of ICT in their libraries", the Pearson correlation matrix result, *df = 39, r.obs = 5, at P<0.05* indicates that "ICT training and knowledge possessed by librarian can influence their attitude toward ICT". In a related study,   Ejedafiru & Lucky (2003) investigated professional librarians' "attitudes toward the use of ICT in the Delta State University library". Twenty respondents were selected from the Delta State university library through a structured questionnaire. Results indicate that e-mail, laptops and scanners are the ICT devices mostly used by the librarians. Further, the study revealed a higher level of professional librarians' ICT skills competence.

Attitudinal change among the librarians is the recipe for adaptation in a new and emerging technological library environment, such as the fourth industrial revolution (4IR) in which technology is gradually taking over some library operations. In this regard, Hussain (2019) contends that librarians all around the world are concerned that the fourth industrial revolution will negatively impact their jobs as computers are capable of replacing humans, potentially leading to a rise in joblessness. In a similar vein, Jabur (2019) remarked that librarians must accept that the 4IR atmosphere will create seamless virtual and physical environments and that such variations will undoubtedly affect not only their existing methods but also their presence as professional librarians. This undoubtedly creates fear among the librarians.
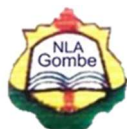
Research methodology

A descriptive survey methodology was used for the investigation with a questionnaire as instrument for data collection. The population comprised of all librarians from six Federal University libraries in the Northeast, Nigeria. An enumerative sampling technique was used on the entire librarian from each library. A copy of the questionnaire was served to each librarian from each university library and was given two weeks within which the completed copies must be returned. After the two weeks, three hundred and seventy-six (376) copies were retrieved which became the sample for the study. The sample was screened and coded into the IBM-SPSS software for statistical analyses.

8. Data Analysis and Discussion

The research question was analysed descriptively with IBM-SPSS, while the research hypotheses were tested through exploratory and confirmatory factor analysis with SmartPls, a partial least square statistical analysis. The results were presented on tables and figures where necessary.

Demographic Information of the Respondents

Table 1: Respondents' Demographic Information

		Frequency	Percentage
	PhD	20	5.3
	MLS/MLIS	141	37.5
Ranks	BLS/BLIS/B.Tech.LIS	189	50.3
	DIPLS	26	6.9
	ATBU Library, Bauchi, Bauchi State	91	24.2
	MAUTECH Library, Yola, Adamawa State	51	13.6
Library	Fed Uni. Lib, Kashere, Gombe State	39	10.4
	Fed Uni. Library, Wukari, Taraba State	27	7.2
	Fed Uni. Library, Gashua, Yobe State	29	7.7
	Ramat Lib. Uni. of Maiduguri, Borno state	139	37
Total		**376**	**100%**

The demographic information of the respondents is presented in table one. According to the ranking of the respondents, the holders of the bachelor of library science, library and information science or bachelor technology in library and information science accounted for the highest among the respondents with 189 on the frequency which represented about 50.3%. It was followed by the master's degree holders in Library science and Information science with 141(37.5%) on the count. Respondents with a diploma in library science and doctorate were 26(6.9%) and 20(5.3%) respectively.

The library domicile of the respondents showed that Ramat Library, University of Maiduguri had the highest number of respondents with 139(37%), it was followe3d in a distance by the Abubakar Tafawa Balewa University Library, Bauchi with 91 respondents which represent 24.2%. Modibbo Adama University of Technology, Yola, Adamawa state was next on the frequency with 51(13.6%), and Federal University library, Kashere, Gombe State had 39(10.4%). Others include
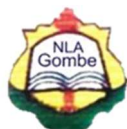
the Federal University library, Gashua, Yobe State with 29(7.7%) Federal University library, and Wukari, Taraba State 27(7.2%) to sum up the 376 respondents in this study.

Research Question 1: What is the level of Librarians' IT adoption in the academic library in Nigeria?

Table 2: Level of Librarian's IT adoption

Statement	VLL	LL	VLL+LL	N	HL	VHL	HL+VHL	Mean
I adoption of Internet resources in my daily work to	13 (3.5%)	15 (4%)	**28 (7.5%)**	44 (11.7%)	248 (66%)	56 (14.9%)	**304 (80.9%)**	3.85
I adoption of E-mail for customer service to ….	8 (2.1%)	25 (6.6%)	**33 (8.7%)**	75 (19.9%)	154 (41%)	114 (30.3%)	**268 (71.3%)**	3.91
I adoption of library databases in information search	5 (1.3%)	36 (9.6%)	**41 (10.9%)**	87 (23.1%)	144 (38.3%)	104 (27.7%)	**248 (66%)**	3.81
Computers are adopted for several library operations to …	12 (3.2%)	37 (9.8%)	**49 (13%)**	112 (29.8%)	155 (41.2%)	60 (16%)	**215 (57.2%)**	3.57
I adopt other IT devices in my daily work to...	16 (4.3%)	32 (8.5%)	**48 (12.8%)**	114 (30.3%)	155 (41.2%)	59 (15.7%)	**214 (56.9%)**	3.56

The level of librarian's Information technology adoption is tested with five items comprising various IT devices. The result in table two indicated that Internet resources for the librarian's daily work had a cumulative very high level of 304(80.9%), low-level adoption stood at 28(7.5%) while 44(11.7%) respondents were neutral regarding the adoption of internet resources by the academic librarians. Further, E-Mail services for customer services were adopted to a high level with a cummulated frequency of 258 which is about 71.3%. The low-level adoption was 33(8.7) while 75(19.9%) respondents did not comment on the statement. The use of the electronic databases by the librarians was high at a joint frequency of 248(66%), the low-level adoption stood at 41(10.9%) while the neutral respondents accounted for 23.1% which represented 87 on the frequency. The computer as an IT device was also adopted by the librarians with a combined high and very high frequency of 215 at 57.2%. About 49(13%) indicated low and very low adoption. Meanwhile, the majority of the respondents did not comment on the statement. The adoption of other IT devices in the librarians' daily work had a combined high and very high frequency of 214(56.9%). Meanwhile, 48(12.8%) experienced low and very low adoption while 114(30.2%) were neutral about it without interfering with each other.

I. **Exploratory Factor Analysis**
   Table 3: Construct and Discriminant Validity

Variables	Cronbach's Alpha	Composite Reliability	AVE	Attitude	Digit Lit Skills	IT Adoption	Info Mgt Skills
Attitude	0.915	0.932	0.734	**0.857**			
Digit Lit Skills	0.760	0.847	0.582	0.042	**0.763**		
IT Adoption	0.705	0.819	0.531	0.073	0.560	**0.729**	
Info Mgt Skills	0.786	0.861	0.609	0.008	0.383	0.474	**0.780**

The internal consistency of the constructs was tested through observation of the Cronbach's alpha value for each construct. Figures in table 3 reveal that each construct had a Cronbach's alpha value above the accepted value of 0.7 (Cho, 2016; Taber, 2017). And the composite reliability values exceed the cut-off mark according to Hair, Hult, Ringle, and Sarstedt (2014). The average variance extracted (AVE) value was observed to ensure convergent validity of the constructs, and according to Fornell and Larcker, (1981) criterion, the AVE value of 0.5 to 0.7 is accepted. Further, the square root of AVE is greater than the "correlation coefficient between the variables" (Hair et al., 2013). This implies that each construct is capable to measure what is designed to measure.

Measurement Model
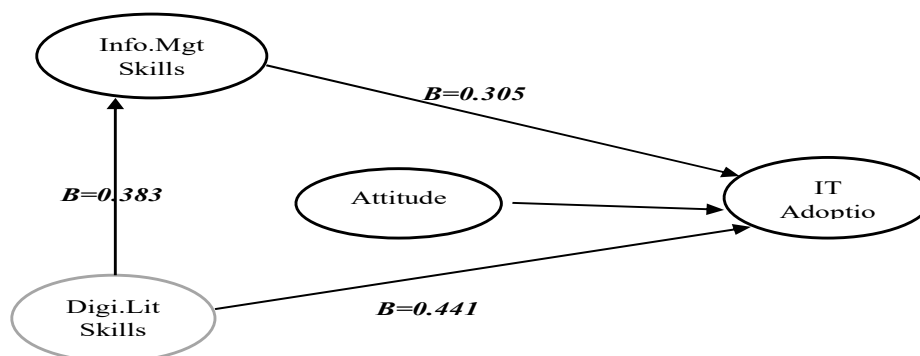
Figure 1: Measurement model

A measurement model was identified to test the factor loadings, R-value and the B value in other to satisfy the objectives of the study. In figure 1, the results revealed that every one unit addition of information management skills results in a 30.5% increase in IT adoption. Similarly, every one unit addition of digital literacy skills will have a 40.41% impact on IT adoption. However, the attitude had a positive but non-tangible impact on IT adoption. Digital literacy skills proved to be significant for information management skills in this study. This is justified with a 30.83% impact with every one unit addition. The result further indicates that information management, digital literacy skill and attitude accounted for a 30.85% variance in IT adoption. While 1.47% variance of information literacy was explained by digital literacy skills.

Hypotheses Testing
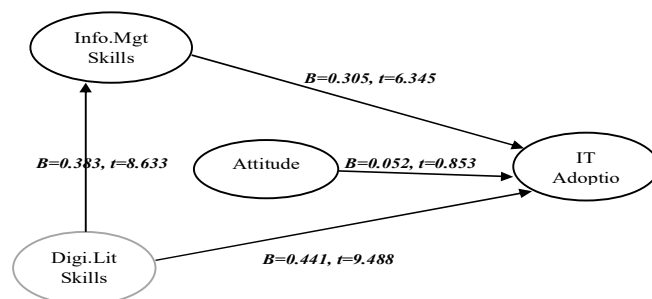
Figure 2: Structural Model

Research hypotheses were tested through basic bootstrapping with 500 subsamples in an advanced set of bias corrected and accelerated (BCa) bootstrap at 0.05 significant level 2-tailed. The result in figure 2 revealed that Librarian's information management skills had a significant impact on IT adoption among academic librarians in Nigeria with a beta value of $\beta=0.305$, $t=6.345$, $p<0.005$. Also, digital literacy skills proved another significant impact on IT adoption with a beta value of $\beta=0.441$, $t=9.488$, $p<0.001$. On the contrary, attitude failed to produce any significant impact on IT adoption with $\beta-0.062$, $t=0.853$. The further result revealed that digital literacy skills are significant for information management skills among the academic librarians with $\beta=0.383$, $t=8.633$, $p<0.001$. Therefore, hypotheses 1.2 and 4 were rejected and the alternative hypotheses were adopted. This implies that on the contrary, information management, and digital literacy skills had a significant impact on IT adoption by the academic librarians in Nigeria. Hypothesis 3 was supported as it failed to pose a significant impact on IT adoption. Also, digital literacy skills had a significant impact on information management skills, hypothesis 4 was rejected and the alternate hypothesis was adopted.

Conclusion and Discussion
This study is aimed at revealing the impact of information management, digital literacy skills and attitude on information technology (IT) adoption by the academic librarians in Nigeria. The analysis of the null-hypotheses Ho1 and Ho2 which predicted a non-significant impact of information management and digital literacy skills on IT adoption was rejected. However, the alternate hypotheses were accepted. This finding aligns with studies such as (Hüsing, Korte, & Dashja, 2016; Rifaudeen, 2015; Gorman & Corbitt, 2002; Arua & Ukwuaba, 2016) in which information management is both vital and necessary for the current dimension in the field of librarianship. Further, attitude to IT adoption did not produce and significant impact in this study. This may another area for further study, including other variables, which motivates attitude such as level of income, library leadership style, a co-worker relationship, work environment etc. The absence of such motivational factors is known to trigger negative to any system (Achugbue, & Anie, 2011; Madu & Dawha, 2019). Digital literacy skill is a prerequisite factor for information management, especially for librarians and information specialists. Null hypothesis 4 which proposed a non-significant impact of digital literacy skills on information management skills was also rejected as the result revealed otherwise. In essence, the librarian must possess digital literacy skills to perform effectively in information management. While the factors which trigger a positive attitude toward IT adoption among the academic librarians remains a topic for further study, other factors such as information management and digital literacy skills have proven to be vital factors
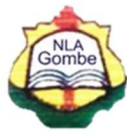
for IT adoption by the academic librarians, on the other hand, digital literacy is deemed very important for information management.

Recommendations

Based on the results of this study, it is recommended that the library management should encourage regular digital literacy training for the librarians. Workshops and seminars on digital literacy should be organized concurrently while the librarians should be motivated to engage in self-training on digital literacy. Further, information management and handling skill training should be a regular programme in the library, and resource persons and experts should hold regular training for the librarians. For the librarians to develop a positive attitude towards IT adoption some motivational factors should be ensured, this will create a positive atmosphere and attitude among the librarians.

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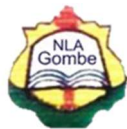
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European Commission. (2003). E-learning: Better eLearning for Europe Directorate-General for Education and Culture. Luxembourg, Office for Official Publicat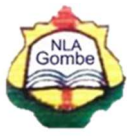ions of the European Communities. Retrieved 20/02/ 2014 from https://www.lu.lv/materiali/biblioteka/es/pilnieteksti/izglitiba/
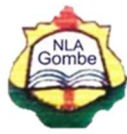
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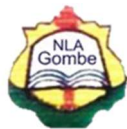
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