Technological Development in the Algerian University Libraries

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Abstract. Bridging the digital divide is an essential element in the aims of the Algerian University. Equitable access to the scientific heritage of the scientific community is away to ensure the advancement of knowledge and the development of the country. Libraries have become an essential showcase for disseminating knowledge and research results. Academic digital libraries are a part of library services using new technologies to provide access to digital collections and to answer to the needs of the information society. So, we are interested in the technological development of the university libraries of the higher national schools in Algeria.

Keywords. Information needs, Librarians behavior, New technologies, Collaborative tools, Academic library, Digital library, Algeria.

1. Introduction

The use of information is a decisive process for decision-making in the context of economic action in a country. Moreover, *"all observers are unanimous: our society evolves towards a civilization dominated by information and It is already plays a decisive role. The raw material of decision-making is the key to success, be it companies or states* ".[1] [tous les observateurs sont unanimes : notre société évolue vers une civilisation dominée par l'information et celle-ci joue déjà un rôle déterminant. Matière première de la décision, sa maîtrise est la clef de toute réussite, qu'il s'agisse des entreprises ou des états].

Information has become a rich resource as much as the raw materials used to develop the economic sphere. Its importance is reflected in the processes of a country's management, planning and decision-making. For this reason scientific, technical, industrial and economic information is today a strategic resource for

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[1] Tugot. Défense économique et maitrise de l'information. In Annales des mines, Série Réalités industrielles, avril, p. 5-6. Cited by Vacher Béatrice. La gestion de l'information en entreprises. Enquête sur l'oubli, l'étourderie, la ruse et le bricolage organisés. Paris, ADBS, 1997, p. 15.

the sustainable development of a country. This information contributes to scientific and cultural development, through university and public libraries, documentation centers and information systems.

Currently, the world of technology get a major changes in the field of teaching and research. In a very short time, these technologies of information and communication (ITCs) have become an inevitable part of educational scenarios of our scientific productio n and research projects.

But, this transition to the ITCs does not been without questions for teachers and students. We are convinced that we are all concerned : teacher-researchers and students to evolve in a world where technological knowledge is absolute and where it becomes an essential element for adaptation to change. With the evolution of the Internet, the mass of information is more important and diverse in all areas.

From this state in the age of digital all our society favors the screen. It has even become a kind of obligation to favor new technologies to the detriment of books and paper, including teaching and scientific research. Today, most libraries move from computerized document management to content digitization. These real changes lead to a deep revolution in the expected services. A paradigm is needed which revolves around a transition from analogue to digital space. Papy Fabrice (2005) proclaims it by revealing this transaction *"... is a true cultural revolution by transforming the very nature of the object being processed".* [2] *[....est une véritable révolution culturelle par la transformation de la nature même de l'objet traité].*

Thus, in the digital age, libraries are obliged to reorient their missions to an immaterial documentary process. In this context of all these changes in the digital age, we present through this study our professional experience within the academic libraries of higher schools of Algeria.

The first study is done through a survey for library users of the national higher school of veterinary of Algiers. The aim is to analyze the real needs of users to set up the future digital library. The second is about specialist's behaviors in libraries of Algerian national higher schools. In order to know how these specialists adapt with new technologies and especially with collaborative tools.

2. The first study : Expectations of library users of national higher school of veterinary of Algiers

In this context, in Algeria scientific documentation in veterinary medicine on this subject requires better organization and a good valorization of scientific production. This leads us to reflect on the establishment of a digital library. The purpose is to consider the combination between traditional services offered by professionals and the new digital services provided by communication and information technologies. We have, for example, the open access to the Internet, the possibility of online research and consultation and finally, the request for selective dissemination of information according to the profile of interest.

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[2] Papy Fabrice. Les bibliothèques numériques. Paris, Lavoisier, 2005, p. 22.

To achieve these aims, the direction of library of of the Algerian Higher National School of Veterinary School (ENSV) propose to embrace this approach of valorization and visibility of its documentary resources and its scientific production from its physical space. Indeed, to carry out this project, a study on the analysis of the needs of users of the ENSV was launched in the year 2013. So, a methodological approach was carried out through a quantitative and qualitative survey, providing online digital resources. This phase was permitted to us to understand the expectations of library users and to assess to their actual needs. *"It is therefore important, first to target the contents of the library, but also to properly design the interfaces of the system"[3]. [Il est donc important, avant tout de bien cibler le contenu de la bibliothèque, mais aussi de bien concevoir des interfaces du système].*

2.1. Research methodology
The organization of the investigation consisted of two main phases. An exploratory phase consisting of a pre-survey, followed by non-directive interviews and another phase devoted to the final questionnaire survey. This paper presents the results of a survey carried out among the users of the national veterinary school of Algiers (students, teachers, teacher-researchers)[4]. So, we present here only a partial results in this study.
It is necessary to recall that complementary interviews of exploratory types were carried out with this category of users after the treatment of the questions to deepen some points that had served as a support in the discussion of our study results.
A total of 250 questionnaires were distributed. The collection lasted 3 months (May, June, September 2013). We had 195 returns, a rate of 77.60% of responses retained.
The communication of the present results is defined as the conclusion of the operating period of the survey carried out.

2.2. Results and discussions: Needs analysis study
2.2.1. Uses and expectations for a digital veterinary library
This initiative to set up a digital library is an expression of a desire to improve access to resources and their use by the development of a digital Algerian library in veterinary sciences and by training and workshops to increase the positive impact of the digital library of science in Algeria. By facilitating the sharing of knowledge, the library will be an essential tool for the development of information and documentary practices for this scientific community**.**

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[3] Mkadmi Abderrazak, Saleh Imad. Bibliothèque numérique et recherche d'informations. Paris, Hermès, Lavoisier, 2008, p. 120.
[4] Survey of Investigation carried out in collaboration with Guermour Karima and Bernaoui Radia. Analysis of the needs of users for the establishment of a digital veterinary library. Case of the Higher National School of Veterinary. In: Project to set up an ENSV digital library. Algiers, ENSV, 2013.

2.2.1.1. Types of documents used in digital library

Users' expectations with a regard to the type of documents that they hope to find, via the future digital veterinary library provide guidance on the sources of information to be taken into account for this project. They express a clear preference for theses with 23%, so we note their strong interest in the scientific production of their own school. The books come in second place, with 22%. They are followed by periodicals and reference books (dictionaries and encyclopaedias, ...) with a rate that varies between 19% and 20%. These two types of documents contain "certified knowledge" and scientific information not only current, but also with precision and synthesis. Multimedia documents account for 16% of the wishes of veterinary users (Figure 1).
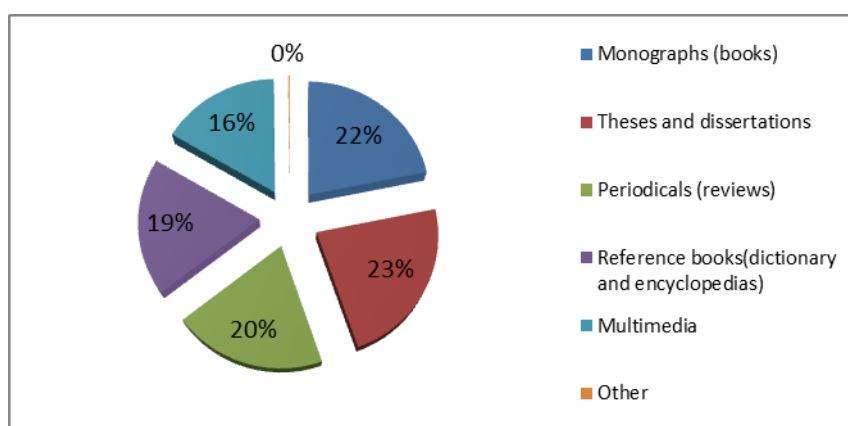

Figure 1 :Types of documents used

We note that this variable interest in all types of documents for users is a part of an important university documentary approach. Moreover, Suzanne Jouglet (2009) in his report IGB (General Inspection of Libraries) realized in the year 2009 and which concerns *"the evaluation of digital in the French libraries"*[5] revealed that the library often plays double role of "creator" and "distributor" of electronic resources. Establishments should therefore be assessed as producers and not just as resource providers.

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[5] Jouguelet Suzanne. L'évaluation du numérique dans les bibliothèques françaises [en ligne], Paris : IGB, 2009, p. 223-232. Available on http://www.ladocumentationfrancaise.fr/rapports-publics/104000149-schema-numerique-des-bibliotheques-rapport-du-groupe-de-travail-evaluation. Cited by Souchon Frédéric. Faire vivre les ressources numériques dans la bibliothèque physique. Le cas des bibliothèques universitaires. Villeurbanne, Enssib, Diplôme de conservateur des bibliothèques, 2014, p. 11.

2.2.1.2. Documentary practices of veterinary users
For the modes of access to documentary research, the results of the survey showed that 46% hoped to carry out their query through the advanced search (combination of several search criteria using the Boolean equations: And, Or, And Not).

On the other hand, almost a third of the surveyed population is focused on simple research, as this procedure is much more fundamental and practical in terms of keyword use. In terms of expert research, by reproducing a whole query on the subject, the percentage of users interested in this application represents 24% (Figure 2). This leads us to argue that this mode of research is more related to information science experts.
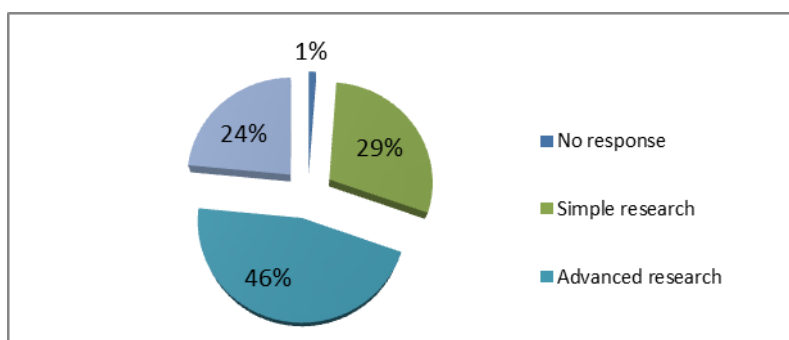

Figure 2: Search Modes

As for the research areas that veterinarians hope to manipulate in order to carry out their documentary research, they are based on a majority rate of 45% who are interested in using several elements of the bibliographic record (title, author, ...) in order to increase the chances of arriving at the relevant information.

Finally, about the search in the textual content of the document, we have 29% of the users who wish to have the primary document in full text on their own place of work. On the other hand, only 24% want to have a general overview of the content, by searching on table of contents (Figure 3).
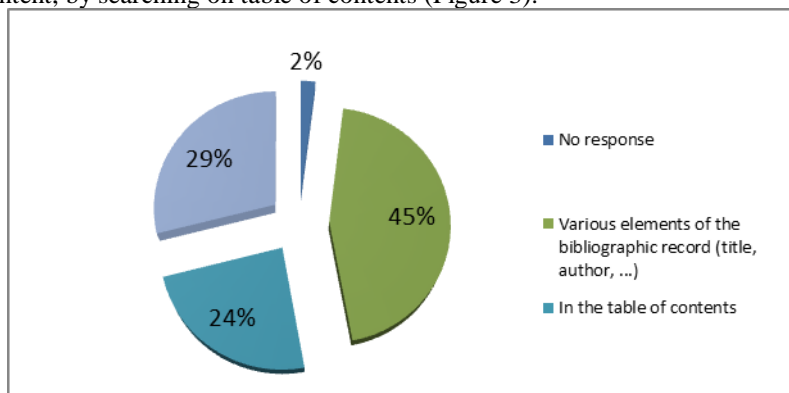

Figure 3: Search Areas

2.2.1.3. Procedure for using documents

In view of the results obtained through this survey, we note that the best way for veterinarians to use the documents through the future digital library of their institution is essentially to download and record all types of documents with 36 % of wishes (Figure 4). This allows to kept and to access for this documents at an appropriate time.

While nearly 24% of respondents hope to have the opportunity to print directly the downloaded document. This suggests that paper can never be replaced permanently by digital printing. These users prefer to manipulate, to flip through papers and take notes on the document.

In addition, a percentage is almost identical for those who wish to consult the documents 15% in full and online, and for those who wish to consult the documents quickly and partially online with 11%. These results suggest that this probably varies according to the time and material that will be acces to them.
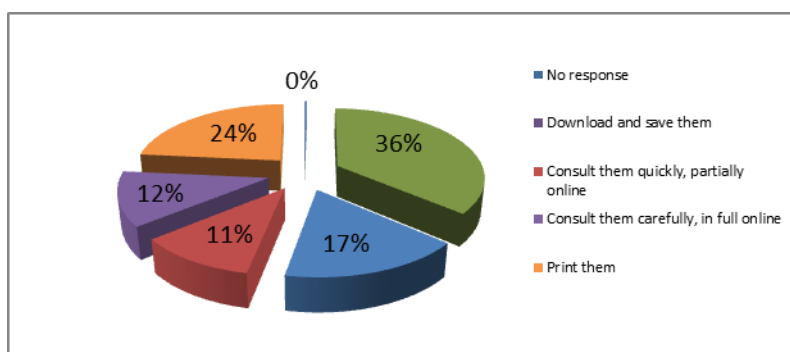

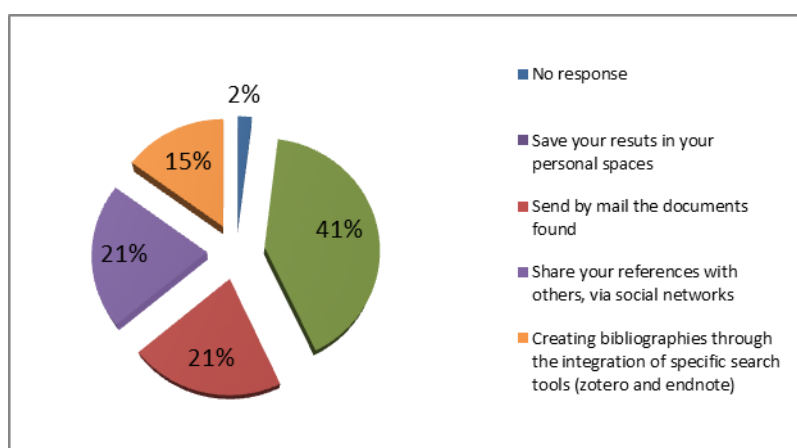**Figure 4: Use of documents**

2.2.1.4. Search results of document

The study of the users of the ENSV library reveals a higher interest rate of the majority of the population (41%) that are intersting to save the results of their research in order to use them in other subjects.

A fairly large rate (21%) as a result are intersting by transmitting them in their own e-mail; then share with others, via social networks. We note that there is a strong desire to create this culture of exchange, collaboration and knowledge sharing between academics universities and researchers. Indeed, the sharing of knowledge can only be built with the written, considered as the only way to materialize the exchange to ensure a certain sustainability, while creating collaborative contacts with national and international scientific communities.

On the other hand, a percentage of only 15% is interested in the creation of the bibliography, through the integration of specific tools (ZOTERO and End Note) (Figure 5). We can argue that these two types of tools are not very developed

within this university community. Although scientific events such as conferences and seminars have already been organized in this direction[6]. It should be mentioned that it is essential to carry out this instruction to download papers, by introducing bibliographic data in this type of tools to help students and teacher-researchers to carry out their research work.
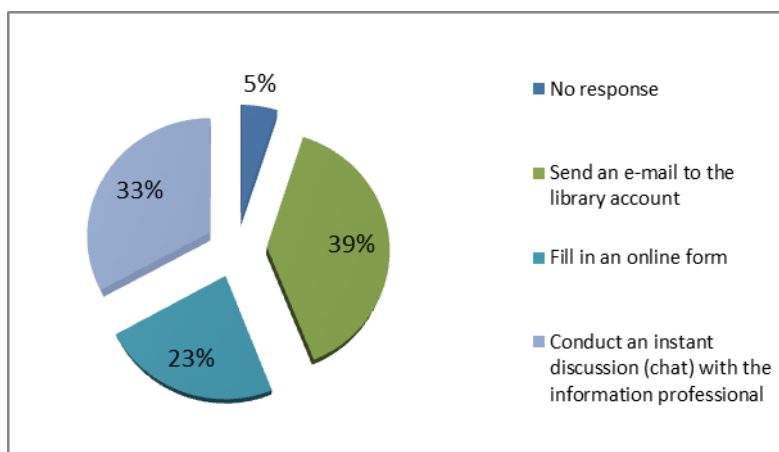

Figure 5: Search results

2.2.1.5. Wishes of the users to the reference service.

The repository is one of the important services that a digital library offers to these users. Inevitably, almost all (92%) of the respondents want the future digital veterinary library to offer this service. It turns out through the results that 39% hope to send an e-mail to the account of the library, via the system questions and answers. This is followed by 33% who wish to conduct online discussions with information professionals to answer their queries in connection with the services and services of the library. While 22.5% prefer to fill in an online form (Figure 6).

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[6] - **Bernaoui Radia.** 21 April 2012: Organization of a seminar on "Collaborative tools and the ISI Web database of Thomson Reuters": Animated by INSA Lyon teachers at the ENSV in Algiers. This seminar is part of the teaching of the module of research methodology to carry out a research project (dissertation, thesis) intended for students of magister and doctorate.
- **Bernaoui Radia.** 4 and 5 December 2013: Organization of a training course on the use of documentary research tools (National System of Online Documentation, Web of Science, End Note).
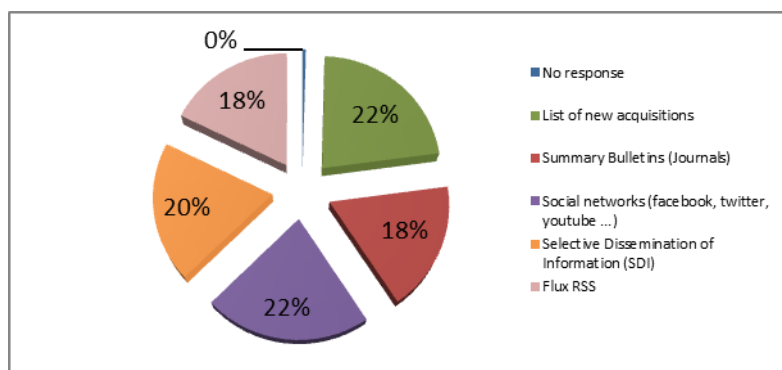
Figure 6: Using the repository

2.2.1.6. Personal space services

Any digital library is made up of several types and tools to disseminate its services. As far as our analysis is concerned, almost 20% of the veterinarians' surveyed wish to receive lists of new acquisitions. 19% are more concerned with the sharing of knowledge and knowledge for the realization of research projects or for the creation of an international exchange and collaboration between veterinarians. This allows soliciting the information professionals in order to guide them to concretize the academic and scientific contacts.

For alerts, we have 17% who want to have a selective dissemination service and 16% hope to have RSS feeds (Figure 7). This justifies that these tools are necessary elements for the creation of an environment based on collaborative work and exchanges between scientists, via the creation of thematic networks of researchers in the service of sustainable development on any geographical location.

An equivalent rate of 16% also applies to those who hope to have summary bulletins for an overview of the contents of the new issues received in their library. On the other hand we have a rate of 11.5% only who is interested in news. Contrary to this, the tool should not be neglected. It should be as a true means of identifying current and innovative issues to strengthen networks between researchers in order to creat a real consolidation of knowledge.
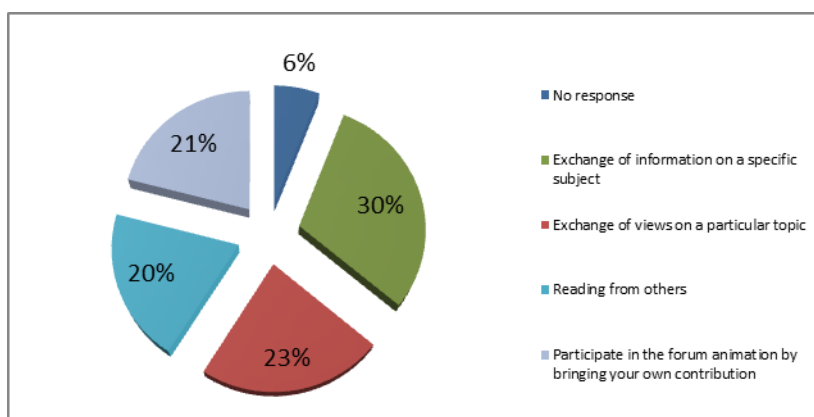
Figure 7: Dissemination of library news

2.2.1.7. Specialized discussion forum

Through our study, we find that the users of the national veterinary school of Algiers are interested in tools for sharing knowledge. The results obtained show that the wish of the users to have this space of discussion forums is marked by a high rate of percentage of 86%.

This considerable interest not negligible in this type of external communication allows the transfer of knowledge and the construction of a capital of competence. In addition, the strong tendency access to specialized discussion forums further strengthens contacts and exchanges between researchers and students. Collaborative work and exchange relationships are new forms of organization and communication that can contribute to new performance in business processes and research.

In the same framework of networks of people sharing we notice the same knowledge and interests. So, we cover almost 30% of the users surveyed who want to exchange information on a particular subject. While 23% hope to share information on a particular topic and 21% wish to participate in the forum's own contribution (Figure 8). It is an effective way to promote membership of virtual scientific communities and the realization of collective scientific productions. It is important to remind that in order to achieve a result in the form of a co-publication and/or to clarify fundamental notions in a specific field, we need a continuous presence of researchers and frequent contacts, using this collaborative tool that can influence the creation of international socio-scientific networks.

Figure 8: Use of specialized forums

2.2. Synthesis of survey results

The finding of this study justifies, a posteriori, the choice of dematerialization of the documents of this veterinary scientific community. In conclusion through this partial analysis of our survey, we believe that it is important to realize this project of setting up a digital veterinary library by integrating this aspect of social networks for a better valorization and visibility of the scientific heritage of the school.

This leads to have a better management and sharing of knowledge in veterinary scientific information at national and international level. But it is obviously necessary to acquire the necessary skills for professionals to integrate effectively into this aspect of social networking.

3. The second study: New behaviors in libraries of Algerian national higher schools

The study to set up the digital veterinary library of the ENSV gave us another study project. However, in the digital age, these changes have given rise to the existence of several communities or consortia. Through this communication, we will speak about the various changes linked to the advancement of information technology and more particularly telecommunications which over the last decade have changed our way of working, reflecting, and reacting.

- Are the professionals of information and commuication information able to integrate in this new digital era and in the field of social networking?

- How should Algerian university libraries adapt to this change?

- How the professionals of information should they communicate with the ITC with their users?

To answer to these questions, we conduct a national survey through many librarians of Higher National School in order to undestand their new behaviors in the Ere digital.

3.1. Research methodology
In our study, 15 libraries of the national higher schools of Algeria were chosen as "the center area" in order to limit the results. Therefore, the nature of the study requires the use of the descriptive approach. This survey permitted us to identify the material and human resources and the nature of the services provided for the libraries of the higher education institutions "Algiers Central Region".

3.2. New behaviors of librarians in the face of digital
3.2.1. Training of professionals
3.2.1.1. Training courses
We found about 60% of the libraries provide this service, which is very important, because it encourages the employees to work and satisfy their knowledge needs, and there are techniques that require special configuration to satisfy their needs. Then, the proportion of libraries that do not organize training courses is not insignificant, which represents 33%, despite the importance of these courses, followed by a small percentage that did not answer the question and represent 7%.

3.2.1.2. Training Programs
Although we did not get enough answers by asking this question, the percentage of answers did not exceed 30%. The answers obtained explained that libraries are preparing training courses as needed. The training is organized by the training department or the users' interest.

3.2.1.3. Training according the competencies
This study shows that one third of the libraries did not respond to the question and the second third believes that the training concern all employees according to the required competencies. The last third believes that the selection of professionals is done randomly or by the choice of the official, according of some members of the study community.

3.2.1.4. Training topics and themes
According to the answers we got through our question about the themes that concern the libraries, most libraries suggested the same topics, the most important are :
- Documentary languages and documentary analysis as basic materials for document processing.
- Automation as a necessary step to facilitate the work on the libraries.
- Electronic management of documents that have become necessary to be easier to access the original documents.

- Knowledge management that the information specialist becomes able to operate the library effectively.
- To create and to manage Networks those allow information professionals to provide the best services to beneficiaries.

Through this investigation, we tried to undestand if the libraries of the national higher schools in Algeria are interested in training staff within the library, and that the libraries did not conduct training courses on a regular basis, but for needed. This explains the lack of expertise experienced by librarians in the field of modern technologies. As the majority of staff proposed the same training programs related to the digital environment.

3.2.2. Information technology in libraries
3.2.2.1. Distance learning

We note that most libraries and 67% do not provide a distance learning platform, where only 28% use such a technique which is a modern means of strengthening education and scientific research. These ratios can be explained by the lack of material resources and the necessary equipment, as well as the lack of sufficient competencies to monitor and manage this type of modern technology.

3.2.2.2. Cooperative networks

The percentage of Library participation in collaborative networks do not participate in such projects, 80% of libraries, compared with only 13% of libraries operating within the framework of the partnership. According to the responses, among the networks in which they contribute are RIBU[7] and CCDZ[8], although it is a unified index rather than a network, it can be the beginning of a collaborative network between libraries. It includes 64 libraries in (PNST)[9], which is the national gateway for theses. It includes the participation of 48 academic institutions, including universities and schools, although they are cooperative projects, but they dont be known yet as networks.

3.2.2.3. Library digitization

More than 50% of libraries use digitization techniques. It is clear that libraries show their desire to develop digital resources despite their limited potential, and that these libraries lack the necessary competencies to achieve such projects.

The figure 9 shows that the majority of libraries 47% digitize documents at the library level. And a very small percentage is commissioned by an external isntitution to carry out this process. This is due to a lack of possibilities to achieve the digitization project, which requires human potential, huge equipment and large storage devices.

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[7] RIBU : Network between university libraries
[8] CCDZ : Algerian collective catalog
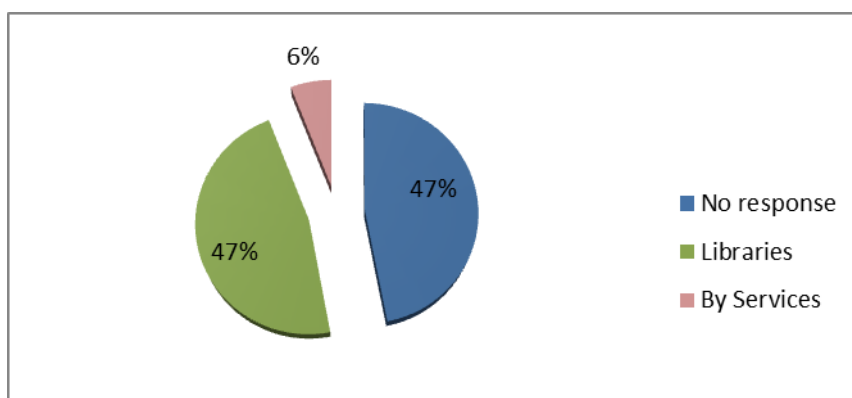[9] PNST National Theses Reporting Portal

Figure 9: Digitization of documents

3.2.3. Digital documents Index

We note that 60% of the libraries allow their digital documents to be stored in the library's general index, which makes it easy to access, compared with 40% of them are available in a special index only in digital documents. (figure 10)
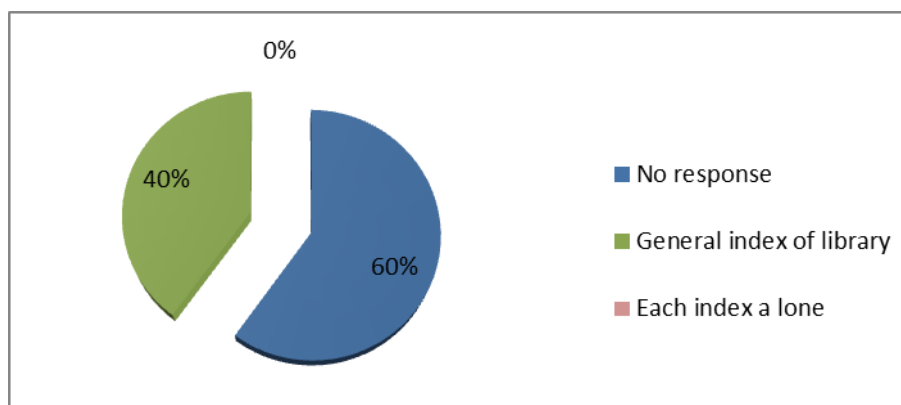

Figure 10: Digital Documents Index

3.2.4. Scientific Production

Of the 15 libraries, only 40% of them collect the scientific production of their school researchers. This is due to the absence of a policy to collect scientific production for these schools and the absence of a framework that allows teachers and researchers to deposit their scientific production within the institution.

However, this production is not valued by the institutions, as only 27% of libraries work on it. This production is not available to researchers and readers in general, where scientific production is not available either through library

sites or higher school sites. The proportion of libraries that make up its scientific product is only 20%.

3.2.5. Open Acces

The proportion of libraries that contribute to the development of open acces in the institution represents 8%. As mentioned above, this is due to the lack of possibilities in libraries. One of the reasons for the development of open acces in libraries is the maintenance and preservation of the scientific production and the evaluation of the results of scientific research.

We note also the delay of libraries in their application of modern technologies as the lack of the platforms and the absence of collaborative networks. However, libraries are interested in the digitalization project, but they are still in the beginning of the stage. The results also revealed the absence of a policy to collect the intellectual production of documentary schools and the problem of valorization. This makes impossible to researchers to access to the national scientific production.

3.2.6. Acquisition of digital resources
3.2.6.1. Methods of acquisition of digital sources

The figure (11) shows that 88% of libraries acquire their electronic resources through the consortium, compared with 12% that they do it alone. This is due to the involvement of libraries in SNDL[10]. However, some libraries still acquire some electronic journals that serve their field of specialization. This system is also active in a national framework as illustrated by "Figure 6" and was established by CERIST under the supervision of the General Direction of Scientific Research of the Ministry of Higher Education and Scientific Research.

We note that all projects are local and that no library has ever been involved in international or even Arab consortium.
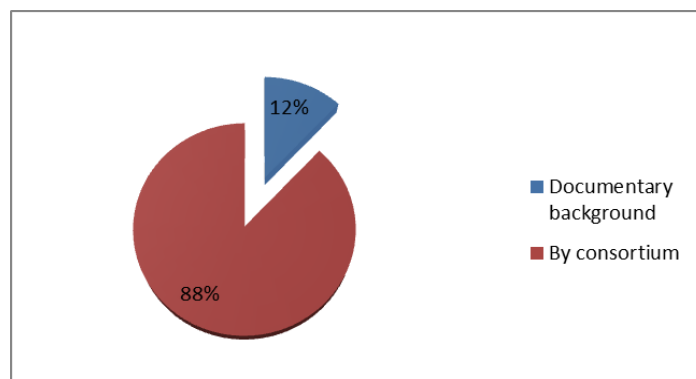

Figure 11: Methods of acquisition of digital resources

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[10] SNDL : National Online Documentation System.

3.2.6.2. Access to digital resources

We note that 67% of the libraries do not advertise the electronic resources, because they do not acquire them. As it benefits from the digital resources found in the system (SNDL), which we find through the sites of all academic institutions of universities, schools, institutes, research centers and others as well as its affiliated libraries in addition to the site of the Ministry of Higher Education and Scientific Research, Research Center in scientific and technical information as well as the Directorate General of Research Scientific research.

3.2.6.3. Training on digital sources

We notice that 47% of the libraries did not take initiatives to recruit beneficiaries to use digital resources, although they benefited from the training of employees through training courses conducted by CERIST. It is responsible for organizing training courses for all those involved in this system, in addition to some courses organized by these suppliers sources are always in coordination with (CERIST). As for the training of beneficiaries, it is the responsibility of the libraries. According to the results, only 7% provides this service. This may be due to technical reasons or problems in connecting to the Internet, and may also be due to the inability of the professional themselves to use these electronic resources.

3.2.6.4. Assessment of the use of electronic resources

80% of libraries do not evaluate the exploitation of digital resources. This is also due to the fact that all the statistics related to the use, evaluation and reporting of SNDL are the responsibility of CERIST, for their study. 7% of the libraries that carry out the evaluation are libraries that are still acquiring some of the electronic resources that concern them.

The results show that the majority of libraries do not acquire digital resources, since they have been involved in the national system of online documents. So, the acquiring and negotiating sources is due to the Ministry of Higher Education and Scientific Research and the Higher Education and Research Centers affiliated to the same Ministry.

3.2.7. Development of library services
3.2.7.1. Tools of a common work

The majority of libraries, 87% do not provide the means of a common work. This is due to the lack of resources and competencies necessary for the preparation of these means. It is also due to the inability of employees to exploit the means available on line.

3.2.7.2. Tools of dissemination of content

We note that 80% of the libraries do not provide the means to dissemination of content, as this type of service requires efficient workers and the lack of necessary skills, especially connectivity to the network, which shows through the previous results that libraries suffer from the problem Internet. The results

show that the development of library services in school libraries is very late. Most libraries do not use the common means of communication and the necessary means of dissemination of content in the digital environment, and the services they provide are inadequate with digital environment.

3.2.8. Establishment of a national digital library
3.2.8.1. Participation to create a national digital library
The proportion of libraries that encourage the establishment of a national digital library reached 80%, which is a considerable and this explain that there are a desire for change and progress and the development of office work and the optimal utilization of information. However, the national digital library can be established according to their respective fields of coordination with the concernedinstitution. For example, the Higher School of Commerce can participate in a project with the National Chamber of Commerce, the Ministry of Commerce and other specialized institutions in this field. In contrast, 20% of libraries reject the idea of creating a national digital library.

3.2.8.2. The importance of consortium and work within the framework of partnership
Libraries show the importance of working in the framework of the clusters and cooperative work. The largest percentage of 27% of the libraries believes that the importance of the clusters lies in the sharing and exchange of electronic resources available to the participating libraries, followed by 26% see their importance as cost sharing, 31% think the importance of the clusters in improving access to information and finally, 16% believe that it allows for joint negotiations to access the sources of information online. (See figure 12)
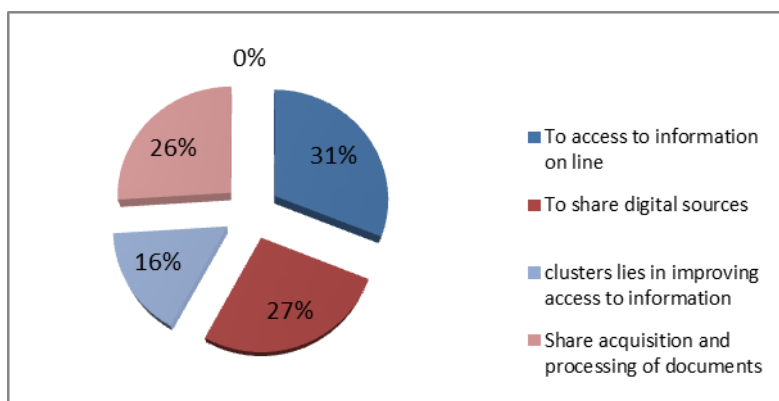

Figure 12: The importance of consortium

3.3. Synthesis of survey results
The results show that the libraries of the national high schools show great interest in the establishment of a national digital library. However, the

achievement of this project requires great potential. The school libraries continue to face many problems, they must therefore work within the framework of partnership in order to to create collaborative work between libraries which should be encouraged.

4. Conclusion

Through this study, we tried to know all the data that are of interest to our research topic. We also tried to identify all the possibilities available in the libraries of the national high schools which represents the study society. It includes the material and human resources and the techniques used in libraries to know the level of development in libraries in terms of modern technologies . It is therefore possible to say that the libraries of the Algerian Higher National Schools are capable of working in the digital environment by exploiting the possibilities available to start a digital library project. This is to exploit these possibilities as it should be and to work on the training of the professionnal of librarianship. It should also solve some of the problems that stand in the way of such projects. The Internet, which is an essential component of the digital environment, as well as means of monitoring and dissemination of information.

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