

Digital Library System Development to Improve the Ten Top Skills of Biology Education Students

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Abstract: Library as a storage room for books that are kept regularly to be read and studied or used as reference material. Advances in digital technology have changed many things, one of which is in the world of education where technology is used in the library field which can build many skills. Advances in technology advances in digital technology are utilized in the field of libraries which can build many skills. In developing skills, the top ten skills include Cognitive Flexibility. Cognitive Flexibility is the ability to think and align cognitive strategy processes in dealing with new and unexpected situations. The research method used is Research and Development with a 4D model approach. The subjects in this study were students of Biology Education, Faculty of Teacher Training and Education, Samudra University in semesters V and VII. The results of the digital library IT expert validation test where Accessibility has a score of 92%, while the lowest, navigability and copyright have a score of 50%. While the validation of the librarian's ease of reading and storing has 88% while the inventory suitability is 50%. While the practicality test for users is 75%. Based on the results of research that the digital library in improving ten top skills of educational students is worth using and requires further development. This is because there is still a need for more in-depth development in increasing the collection of the diversity of books in the biology study program of The University of Samudra

Keywords: Digital library; Ten top skills; Cognitive flexibility

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Introduction

The library is defined as a room where a number of books are stored regularly to be read and studied or used as reference material. Libraries require storage space for various educational and scientific results, such as a collection of scientific writings, such as a collection of professionally recorded works with standard procedures to meet the needs of the field of study, field research, conservation, lighting, and recreation for the users. However, there are still many libraries that are not optimal in processing materials. Libraries because there is no special staff who handles and is directly responsible for the field of libraries (Suherman, 2009)

With so many scientific papers stored, a good inventory is needed to make it easier for readers to

obtain books or information in the library in the form of a service aimed at all members of the school community: students, teachers, staff, school committees and parents (Ag et al., 2020). Education will run well if it is supported by facilities that support learning activities so that the objectives of the learning will be achieved well as well.

The existence of a library is very necessary with the consideration that: (a) The library is a learning resource in the school environment; (b) The library is one component of the teaching system; (c) the school library is a source to support the quality of education and teaching; (d) the library as a learning laboratory that allows students to sharpen and expand their ability to read, write, think and communicate (Kastro, 2020).

Advances in digital technology have changed many things, one of which is the world of education where digital technology is used in the library sector which can

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build many skills. In this case, it is hoped that the generations will be able to increase 10 Skills called the Ten Top Skills consisting of Complex Problem Solving, Critical thinking, Creativity, People Management, Coordinating With Others, Emotional Intelligence, Judgment And Decision Making, Service Orientation Negotiation, and Cognitive Flexibility (Sertifikasiku. 2020). From the description above, the last skill aspect is Cognitive Flexibility, which means having the ability to think and align cognitive strategy processes in dealing with new and unexpected situations (Canas, 2006). Cognitive Flexibility has three aspects, namely awareness of choices, the ability to be flexible, and self-efficacy.

In UU No. 43 of 2007 concerning libraries, it is stated that the libraries are institutions that manage collections of written works, printed works, or recorded works professionally with a standard system to meet the educational, research, preservation, information, and recreational needs of the users. Libraries can be a solution for teaching and learning activities in universities. In the library, students can gain more extensive knowledge

Thus, the existence of a library in a university is a learning tool, it is necessary to have a program or activity carried out in a university. One of the most common types of libraries in Indonesia is the university library. As a type of library, the university library is often likened to the heart of a university. As the heart of higher education, its existence is a vital element and cannot be ruled out, so the progress of higher education is strongly influenced by the quality of the library which can be viewed from the number of references/books available, services and the availability of other facilities in the library including reading rooms and arrangement of collections (Mubasyaroh, 2016)

There are many types of libraries in Indonesia, but in general, they can be classified into four types, namely: conventional libraries, hybrid libraries, bookless libraries, and digital libraries. Conventional Libraries, Libraries with the most types, where conventional libraries are libraries that are generally managed by institutions both in the field of education and in the field of collection of scientific works. While still using a special room, Hybrid Library, Hybrid library is a combination of the digital world with the conventional. This type of library can be accessed either by a collection of textbooks that can be found in the library while digitally it can be accessed via the internet or the like, Bookless library, is a library that has no textbooks at all. This type of library is fully electronic/digital books can also be based online. In the process of utilizing this electronic book, of course, it requires special equipment to read it such as an e-reader (Purnomo, 2016), A digital library is a system that provides a user community with integrated access that reaches the breadth of information

and knowledge that has been stored and organized properly. Here is the library as a source of information as the backbone of the forward movement of institutions, especially educational institutions toward information development (Harahap, 2018). Based on research by Hafiza et al., (2022), there is a relationship between digital literacy and learning outcomes in biology learning at SMP Negeri 12 Pontianak. This study aims to develop a digital library that can improve Improve Cognitive Flexibility in Student Biology Education.

Ten top skills or the so-called ten skills that are expected to be possessed by students in facing challenges in the era of the industrial revolution 4.0. In the industrial era 4.0, it is hoped that there will be a change in the speed of getting information on technological advances both in the physical and biological fields.

The 10 skills that serve as guidelines for competing in 2020 as the peak of the industrial revolution 4.0 are Complex problem solving, Critical thinking, Creativity, People Management, Coordinating with others, Emotional intelligence, Judgment and decision making, and Service Orientation, Negotiation, and Cognitive flexibility. As time goes by, technology also develops. In addition to technology, humans also need to follow developments so they are not left behind (Septiana, 2020).

The World Economic Forum issued a report related to human skill needs in 2020. They also ranked them among the most important things in the first to the last position. Compared to 2015, not many have changed positions except in the field of creativity. If in 2015 creativity was at level 10, in 2020 creativity will rise drastically to the three most important positions (Lestari, 2019).

Method

The research method used is research and development with a 4D model approach, namely Define, Design, Develop and Disseminate, which was developed by Semmel and Melvyn in 1974 (Karniawan, 2017). The sample in this study were students of biology education at Samudra University. Data was collected through non-test which included questionnaires and validation instruments. Instruments in data collection used in this study consisted of two types, namely expert validation data and response data from field trials. This field trial data is in the form of a practicality test in the use of digital libraries and then continues with the implementation stage and dissemination. The data analysis technique that will be used is descriptive qualitative statistics. For expert validation and field trials, data analysis techniques were used by calculating the value of the questionnaire.

Result and Discussion

The results of a questionnaire that has been given to the IT expert showed that the average score obtained was 70% covering an average of ease in accessing digital library is by 92% while copyright and navigability reached 50%. The low average navigability is due to the need for permission from the author of books that have been included in the digital library, while the average ease of updating library collections and the ease of library development is 75%. As for the average collection evaluation of 63%. More details can be seen in Figure 1.

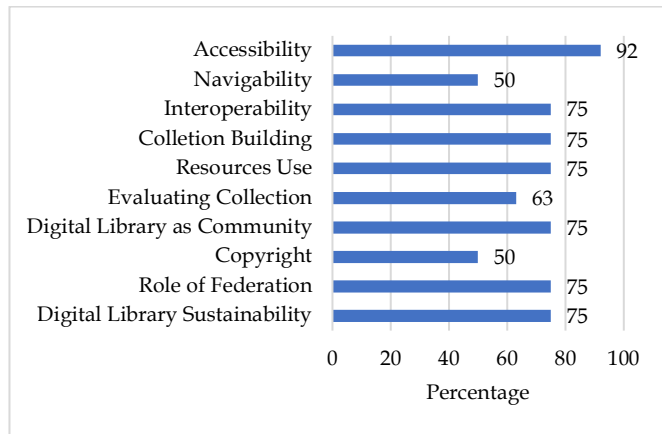


Figure 1. IT Expert Validation

While the assessment of librarians is an average of 64% so it is necessary to make digital library developments where the number of collections is still not maximized to make book selection is still limited.

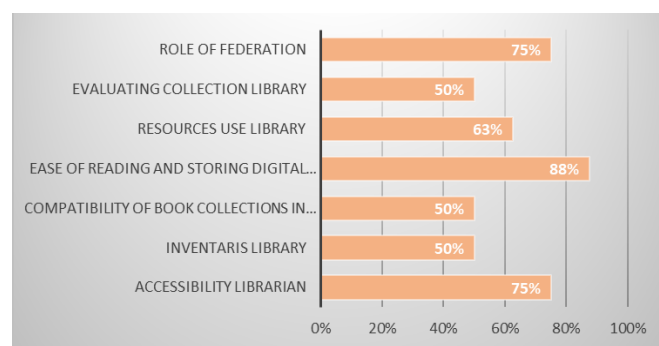


Figure 2. Librarian Expert Validation

Development of Product

Digital products have undergone revision from the validator so that a digital library is formed that can increase ten top skills. Digital library products can be viewed either from a computer or via Android to make it easier for users to view and access digital books via computer or android.



Figure 3. Digital Library Computer



Figure 4. Digital Library from android

Practicality Test

After being validated by experts, a practicality test is carried out by students as users of the digital library of the teaching and education faculty of Samudra University were from the level of practicality test on users 75%

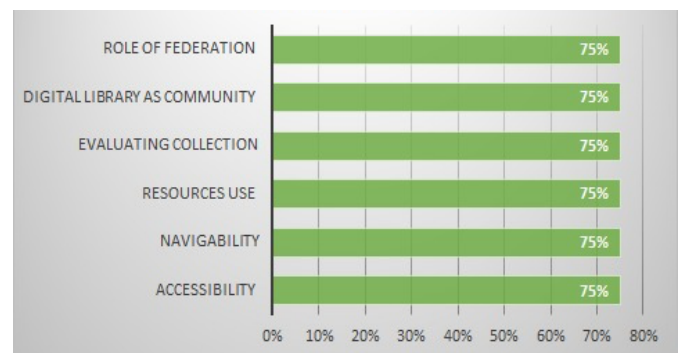


Figure 5. Practical Test

The results of the latest research developments based on the validation of IT experts are very easy to access digital libraries as indicated by a Likert scale of 92%, and the lowest percentage is 50% copyright. The low average navigability is due to the need for permission from the author of the book that

has been entered into the digital library to produce an average IT Validation result of 70%. From the Validation Librarian has an average of 64% indicated by the ease of reading 88% and has the lowest percentage of 50% on the ease of evaluation, the suitability of the book collection, and the suitability of the inventory in this digital library, this is a lack of navigation in the evaluation which has an impact on the management of inventory and collections. so that there are still discrepancies between the inventory and the available book collections. The results of the practicality test were obtained from students in semesters 5 and 7 with a total of 50 students and obtained an average of 75% from feature settings, community, collection evaluation, use of sources, interoperability, accessibility

Conclusion

Based on the results of this study concluded that the development of digital library systems to improve ten top Biology education student skills, the results of the validation from both IT and librarian validation stated that it was feasible to use and needed further development.

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References

- Ag, R.A., Zulfitri, Z., & Dewi, H.I. (2020). Pengolahan Bahan Perpustakaan Perpustakaan Tingkat Sekolah Dasar Desa Iwul, Parung. *Jurnal kajian penelitian dan Pendidikan dan pembelajaran*. 4(2a), 553-561. <https://doi.org/10.35568/naturalistic.v4i2a.794>
- Canas, J. (2006). Cognitive Flexibility. *International Encyclopedia of Ergonomics and Human Factors*, 1-14. <http://dx.doi.org/10.13140/2.1.4439.6326>
- Hafiza, N., Rahayu, H. M., & Kahar, A. P. (2022). The Relationship Between Digital Literacy and Learning Outcomes in Biology Learning for Students. *Jurnal Penelitian Pendidikan IPA*, 8(1), 171-176. <https://doi.org/10.29303/jppipa.v8i1.1067>
- Harahap, W.R. (2018). Empat Jenis Perpustakaanan Zaman "Now". *JUPI (Jurnal Ilmu Perpustakaan dan Informasi)*, 3(2), 194-202. <http://dx.doi.org/10.30829/jupi.v3i2.1945>
- Karniawan, D. 2017. Pengembangan Perangkat Pembelajaran dengan Media Screencast o-Matic mata Kuliah Kalkulus 2 menggunakan Model 4-D Thiagarajan. *Jurnal Siliwangi* 3(1), 214-219. <https://doi.org/10.37058/jspendidikan.v3i1.193>
- Kastro, A. (2020). Peranan Perustakaan sekolah sebagai sarana pendukung gerakan literasi sekolah menengah pertama. *Jurnal Kajian Pembelajaran dan Keilmuan*. 4(1), 92-100. <http://dx.doi.org/10.26418/jurnalkpk.v4i1.40887>
- Lestari, P. Y. 2019. Esai-Cognitive Flexibility Kemampuan Yang Dibutuhkan Kini dan Masa Depan. <http://penulis.ukm.um.ac.id/esai-cognitive-flexibility/1>.diakses 24/03/2021
- Mubasyaroh. M. (2016). Pengaruh Mutu Perpustakaanan bagi Peningkatan Mutu Pendidikan Perguruan Tinggi. *Libraria*, 4(1), Juni 2016, 77-103. <http://dx.doi.org/10.21043/libraria.v4i1.1246>
- Purnomo, P. (2010). *Manajemen Pengembangan Koleksi Perpustakaanan*, Jakarta: Lembaga Penelitian Uin Syarif Hidayatullah.
- Septiana, T. (2020). *Berikut 10 Skill Yang dibutuhkan di dunia kerja tahun 2025* Retrieved from: <https://industri.kontan.co.id/news/berikut-10-skill-yang-dibutuhkan-di-dunia-kerja-tahun-2025>
- Sertifikasiku, (2020). *10 Future Skills 2020 yang harus dimiliki Generasi Milenial Indonesia di Persaingan Global*. Retrieved from: <https://sertifikasiku.com/10-future-skills-2020>
- Suherman. (2009). *Perpustakaan Sebagai jantung Sekolah*, MQS Publisng : Bandung
- Suwarno, W. (2013). *Ilmu Perpustakaanan dan kode etik Perpustakaanwan*, Yogyakarta: Aruuz Media