

DEVELOPMENT OF AN ANDROID-BASED *KOBO*TOOLBOX ASSESSMENT APPLICATION FOR THE IDENTIFICATION OF SPECIFIC LEARNING DIFFICULTIES IN ELEMENTARY SCHOOLS

^{*1}Dewi Jayanti, ²Abdullah Pandang, ³Parwoto

^{*1}Program Studi Bimbingan dan Konseling, ^{2,3} Program Pascasarjana Universitas Negeri Makassar (UNM), Makassar, Indonesia

Email: ^{*1}dewij143@gmail.com, ²abdullah.pandang@unm.ac.id, ³parwoto@unm.ac.id

Abstract

This study aims to develop an assessment application based on KoboToolbox to identify specific learning difficulties in elementary school students. The main objectives are to determine user needs, design a prototype, and evaluate the application's validity and practicality. The research employs a mixed-methods approach combined with Research and Development (R&D) using the Borg and Gall model. Findings indicate that teachers urgently need a practical digital assessment tool. The application was successfully developed with a user-friendly Android-based interface. Expert validation results showed a validity level of 92% (categorized as very valid), while the practicality test reached 89% (categorized as very practical). The application is considered effective as a support tool for early and structured detection of specific learning difficulties in elementary school settings.

Keywords: Learning Difficulties, Assesment Aplication, KoboToolbpx, Android

Abstrak

Penelitian ini bertujuan mengembangkan aplikasi asesmen berbasis KoboToolbox untuk mengidentifikasi kesulitan belajar spesifik pada siswa sekolah dasar. Tujuan utamanya adalah mengetahui kebutuhan pengguna, merancang prototipe, serta menguji validitas dan kepraktisan aplikasi. Penelitian menggunakan metode campuran (mixed methods) dengan pendekatan Penelitian dan Pengembangan (Research and Development) model Borg and Gall. Hasil penelitian menunjukkan bahwa guru sangat membutuhkan alat asesmen digital yang praktis. Aplikasi berhasil dikembangkan dengan antarmuka sederhana berbasis Android. Validasi ahli menunjukkan tingkat validitas sebesar 92% (kategori sangat valid), dan hasil uji kepraktisan mencapai 89% (kategori sangat praktis). Aplikasi ini dinilai efektif sebagai alat bantu untuk mendeteksi kesulitan belajar spesifik secara dini dan terstruktur di lingkungan sekolah dasar

Kata kunci: Kesulitan Belajar, Aplikasi Assesmen, KoboToolBox, Android

INTRODUCTION

Specific learning difficulties are conditions where children with normal intelligence experience significant barriers in certain academic aspects such as reading (dyslexia), writing (dysgraphia) and arithmetic (dyscalculia). These barriers are not caused by intellectual impairment, but rather by impairments in processing information, such as

perception, memory and expression. Unfortunately, these conditions are often not identified due to teachers' limitations in conducting initial assessments. As a result, students who experience learning difficulties are often considered lazy or less intelligent, even though they need a special approach. The results of an initial survey conducted on 35 teachers in several elementary schools in Gorontalo City showed that most teachers have students who are not able to recognize letters, read fluently, write according to dictation, or do basic calculations. It was even found that in high grades (grades 4-6) there are still students who cannot read well. This condition shows the urgency of having assessment tools that can help teachers recognize specific learning difficulties quickly, accurately and practically.

In the ever-growing digital era, the world of education is required to be able to adapt to technological advances, including in terms of learning assessment. One of the fundamental challenges at the primary school level is the ability of teachers to conduct early detection of students who experience learning difficulties. Learning difficulties in primary school children often appear in the form of barriers to reading, writing or arithmetic. These barriers, if not identified early, can lead to a decrease in learning motivation, academic achievement and even self-confidence. Therefore, there is a need for an innovative assessment system that is not only efficient, but also easy to use by teachers in the field.

To answer this need, this research develops a KoboToolbox-based assessment application that can be accessed through Android devices. This application is designed to help teachers make early identification of students who experience learning difficulties quickly, accurately, and integrated with digital databases. KoboToolbox was chosen because it has open-source characteristics, is flexible, and compatible with various devices. This application is commonly used in social and humanitarian research to collect field data, but in the context of education, this platform is adapted into a psychopedagogic assessment tool oriented to the needs of primary school teachers.

Early detection of learning difficulties is a crucial part of the primary education process. According to Lerner (2000), learning difficulties are impairments in one or more basic psychological processes related to the understanding or use of language, both spoken and written. Children who experience learning difficulties usually show obstacles in their ability to read, write, count, or process information. These problems are often unnoticed by teachers and parents because they do not always appear in conspicuous behavior. Teachers as the spearhead of learning in primary schools have a central role in identifying early symptoms of learning difficulties. However, in practice, teachers often face limitations in time, instruments and technical ability to conduct comprehensive psychopedagogic assessments. Manual assessments using observation sheets or anecdotal notes tend to take a long time and are difficult to process into systematic data. In this context, digitizing assessments is an urgent need to help teachers make identification more efficient and measurable.

One of the obstacles faced by classroom teachers in assessing learning difficulties is the lack of valid, reliable and easy-to-use measurement tools. Most of the available assessment instruments are paper-pencil and require manual analysis that is prone to subjective errors. In addition, the high administrative burden of teachers means that the process of observing and recording assessment results is not always carried out consistently. In the Indonesian education system, assessment of learning difficulties generally relies on individual observations, written test results or special assistant teacher reports. In fact, modern assessment models emphasize the importance of collecting data from various sources and with various techniques (data triangulation), including interviews, behavioral observations, and analysis of student work. Digitalization of platform-based assessments such as KoboToolbox allows all of this data to be documented in a structured manner, easily accessible, and can be analyzed quickly for follow-up purposes.

Digital transformation in education has opened up new opportunities for the development of a more inclusive and adaptive assessment system. According to the *Technology Acceptance Model* theory (Davis, 1989), teacher acceptance of educational technology is influenced by two main factors: *perceived ease of use* and *perceived usefulness*. In the context of learning difficulties assessment, digital applications can help teachers collect data faster, store observations securely, and generate diagnostic reports automatically. KoboToolbox as a *cloud-based* digital platform allows teachers to input assessment data without having to be constantly connected to the internet. Data filled in via Android devices can be synchronized when a connection is available, thus supporting flexibility of use in areas with limited network access. In addition, KoboToolbox provides a *form-based* interface (*form builder*) that allows users to create custom assessment instruments as needed, such as learning behavior checklists, indicators of reading difficulties, or basic arithmetic skills.

In this study, the development of the assessment application followed the stages of *Research and Development* (R&D) which included needs analysis, digital instrument design, limited trials, and user evaluation. The initial stage involved identifying primary school teachers' needs for learning difficulty assessment tools. The results of the preliminary study showed that most teachers experienced difficulties in detecting children with reading and counting barriers due to the absence of practical and standardized tools. Next, the researcher designed a *digital form* on KoboToolbox that contains indicators of common learning difficulties, such as: (1) errors in reading letters or syllables, (2) difficulties in understanding the content of simple reading, (3) errors in addition or subtraction, (4) difficulties in recognizing number symbols, and (5) difficulties in following written instructions. Each indicator is measured using a three-level observation scale: *often appears*, *sometimes appears*, and *does not appear*. Teachers can access the form through the KoboCollect app on Android devices and fill in the data based on direct classroom observations. After filling in, the system will save the data to the KoboToolbox server and generate a simple report in the form of a *dashboard* that displays the number

of students with potential learning difficulties. This report can be used by teachers to design further interventions, such as remedial learning, consultation with counseling teachers, or collaboration with parents.

The implementation of this assessment application in primary schools provides various practical benefits. First, in terms of efficiency, teachers no longer need to record observation results on paper, so the data collection process becomes faster and more organized. Second, in terms of accuracy, digitally inputted data reduces the risk of losing information and increases the reliability of assessment results. Third, in terms of collaboration, assessment results stored online can be easily accessed by the school for follow-up purposes. From the results of the limited trial, teachers who used the KoboToolbox application stated that this system made it easier for them to identify students with reading and numeracy difficulties. They also felt that the app helped develop reflective awareness of students' learning behavior. In addition, the digital report format allows teachers to communicate assessment results more objectively to parents and principals.

This digital assessment innovation has far-reaching implications for improving teachers' capacity to use educational technology. Mastery of assessment technology not only accelerates the process of identifying learning difficulties, but also strengthens teachers' ability to use data for learning decisions. According to UNESCO (2020), teachers' digital literacy is one of the important pillars in realizing inclusive and equitable education. In addition, the implementation of KoboToolbox-based digital assessment strengthens the *data-driven education* approach, where learning decisions are based on empirical evidence from student data. Thus, teachers can design teaching strategies that are more targeted and adaptive to individual needs. This model is also in line with the spirit of *Merdeka Belajar*, which emphasizes flexibility and innovation in the learning process.

Inclusive education requires an early detection system that is sensitive to differences in student learning abilities. Through the KoboToolbox-based assessment application, teachers can more quickly recognize students who need additional support without having to wait for a formal diagnosis from an expert. This is in line with the principle of early intervention proposed by Mercer & Pullen (2009), that the success of inclusive education programs is largely determined by the speed in recognizing and responding to children's learning needs. With a digital assessment system in place, schools can develop a sustainable database of student learning profiles. This data not only helps in the development of individualized learning programs, but also forms the basis for designing teacher training and school policies that are more responsive to learner diversity.

METHODS

This research uses a mixed methods approach, which combines qualitative and quantitative approaches to gain a deeper and more comprehensive understanding of the phenomenon under study. This approach was chosen to address the complexity of specific learning difficulties in primary schools and to develop a KoboToolbox-based assessment

application. Qualitative methods were used to explore user needs and understand the context in depth, while quantitative methods were used to measure the validity and practicality of the products developed. The development procedure began with a needs analysis through an initial survey of elementary school teachers in Gorontalo City. Data was collected through interviews and questionnaires to explore factual conditions in the field. Next, planning was carried out, which included determining objectives, product specifications, preparing assessment materials, and planning resources. The initial product developed consisted of information modules, assessment instruments, KoboToolbox application, and application usage guides. The design validation stage was carried out by three experts, consisting of two content experts (psychologists and PGSD lecturers) and one media expert (IT expert). Validation was conducted through rating scales and consultative interviews to assess the content and technical aspects of the application. The validation results were used to revise the product design before the limited trial was conducted on ten elementary school teachers. Teacher assessment was used to assess the practicality and effectiveness of the application in the context of real classroom use.

This research was conducted in five elementary schools in Gorontalo City in the even semester of the 2024/2025 academic year, for approximately two months (January-February 2025). The research subjects consisted of teachers at the needs analysis stage, expert validators at the validation stage, and user teachers at the product practicality trial stage. The types of data collected include qualitative data from interviews and observations, as well as quantitative data from validity and practicality assessment questionnaires. The data collection instruments consisted of validation sheets, interview guides, and questionnaires. Interviews were conducted freely with certain guidelines, while the questionnaire used a modified Likert scale with five answer options (Very Suitable, Suitable, Quite Suitable, Less Suitable, and Not Suitable). The data obtained is used as a basis for evaluating and improving the assessment application developed to suit the needs of teachers and the characteristics of elementary school students.

RESULTS AND DISCUSSION

This research began with a needs analysis stage through interviews and distributing questionnaires to some teachers in five elementary schools in Gorontalo City. The results of this stage show that the majority of teachers face difficulties in identifying students with specific learning disorders such as dyslexia, dysgraphia and dyscalculia. Most teachers rely on manual observation and do not have structured assessment instruments. This suggests an urgent need for a systematic, practical and easy-to-use tool for assessing learning difficulties. Furthermore, at the initial product planning and development stage, researchers developed application specifications that referred to user needs. The KoboToolbox application was designed in the form of an android-based digital platform equipped with an identification questionnaire and usage guide. The initial product was also equipped with an information module on specific learning difficulties and assessment

instruments for each type of disorder. This initial design was developed in stages, adjusted to the input from the literature review and preliminary study.

Product validation was conducted by three experts, two content experts and one media expert. The validation results showed that the application had a high level of validity with an average score of >80% in the aspects of content and technical design. Content experts gave notes to improve the editorial of assessment items to be more in line with the characteristics of elementary school students, while media experts suggested improving the user interface to make it more interactive. Based on this feedback, revisions were made to the instrument content and application appearance. After expert validation, a limited trial was conducted with ten teachers from five elementary schools. This trial aimed to assess the practicality of using the application in the field. The results of the trial showed that teachers felt that the KoboToolbox application was very helpful in the process of identifying students with learning difficulties. The application is considered practical because it can be used through a smartphone, and efficient because it automatically processes the results of questionnaire answers into data that can be directly analyzed.

In the practicality trial, the average score given by teachers on the practicality of the application reached 87%, which is included in the “very practical” category. Teachers stated that with this application, they no longer need to use manual observation methods that are time-consuming and not always accurate. In addition, this application is considered quite flexible because it can be used online or offline, depending on the conditions of each school. Data from the validity and practicality questionnaires analyzed quantitatively showed that the KoboToolbox application was in the valid category and feasible to use. This assessment is corroborated by qualitative responses from teachers and experts who mentioned that this application is an innovation that is relevant to the needs of assessment in elementary schools, especially in the context of limited human resources and measuring tools experienced by many schools in the regions.

The final revision resulted in a more responsive KoboToolbox assessment application, with additional features such as instructions on the category of assessment results (normal, moderate, severe), as well as initial treatment recommendations. Teachers can automatically download the result report in PDF format, which facilitates documentation and reporting to parents. This innovation strengthens the application as a practical assessment medium that can improve the quality of inclusive education services in primary schools. Overall, the results showed that the development of the KoboToolbox assessment application proved to be valid, practical, and useful for use in identifying specific learning difficulties in elementary school students. This application is expected to be an alternative solution for teachers in conducting initial assessments of students, as well as being an applicable supporting tool in more inclusive and data-based education services.

CONCLUSION

Based on the results of research and development, it can be concluded that the KoboToolbox application is suitable for use as an assessment tool to identify specific learning difficulties of elementary school students, especially dyslexia, dysgraphia, and dyscalculia. The development process was carried out through seven stages of the adapted Borg and Gall model, starting from needs analysis to product revision. The results of expert validation show that this application has a high level of validity both in terms of content and media. Tests on teachers in five elementary schools in Gorontalo City also showed a high level of practicality, as well as positive responses to the ease of use and benefits of the application in the assessment process. Thus, the developed KoboToolbox application can be a practical and innovative solution in helping teachers identify learning difficulties systematically and efficiently. The app not only helps in data collection but also provides relevant and accurate information as a basis for further educational intervention. This research also makes a real contribution to the development of educational digital media based on field needs, and is expected to continue to be refined and applied more widely in other schools.

REFERENCES

- A'yun, S. Q., & Latipah, E. (2022). UPAYA GURU DALAM IDENTIFIKASI SISWA DISLEKSIA. *Jurnal Multidisiplin Ilmu*.
- Adhim, J. baswara. (2019). Identifikasi Anak Kesulitan Belajar Matematika (diskalkulia) di Sekolah Dasar. *Jurnal Pendidikan Khusus*, 12(3), 1–8.
- Armella, R., & Rifdah, K. M. N. (2022). Kesulitan belajar dan faktor-faktor yang mempengaruhi kesulitan belajar. *Sultan Idris Journal of Psychology and Education*, 1(2), 14–27.
- Debi Tripuanti, Fitri Siti Sundari, & Resyi A. Gani. (2024). Analysis of Beginning Reading Difficulties of Dyslexic Students. *Journal of International Multidisciplinary Research*, 2(1), 198–204. <https://doi.org/10.62504/jimr235>
- Dewi, K. Y. F. (2011). Diagnosa Kesulitan Belajar. i–i. <https://doi.org/10.1109/isqed.2008.4479675>
- Dewi, K. Y. F. (2022). Mengelola Siswa Dengan Kesulitan Belajar Menulis (Disgrafia). *Daiwi Widya*, 8(5), 30–41. <https://doi.org/10.37637/dw.v8i5.909>
- Eka Susanti, D., Sudirman, S., & Fahrudin, F. (2021). Peran Asesmen Kebutuhan Dan Perencanaan Pendidikan Dalam Pengembangan Lembaga Pendidikan Khusus (ABK). (JPAP) *Jurnal Praktisi Administrasi Pendidikan*, 5(2), 64–68. <https://doi.org/10.29303/jpap.v5i2.492>
- Fadlilah, A. N. (2021). Hambatan Pelaksanaan Asesmen Informal Dalam. *Cakrawala Dini*, 12(1), 62–72.

Gall, MD, Borg, WR, & Gall, J. (1983). Penelitian pendidikan: Pengantar (keenam). Longman Publishing.

Gischa, S. (2021). Pengertian identifikasi, asesmen dan Intervensi. Kompas. <https://www.kompas.com/skola/read/2021/07/05/135049169/identifikasiasesmen-dan-intervensi-pengertian-beserta-contohnya#:~:text=Asesmen juga bisa diartikan sebagai,yang pernah atau sedang dijalankan.>

Haifa, N., Mulyadiprana, A., & Respati, R. (2020). PEDADIDAKTIKA : JURNAL ILMIAH PENDIDIKAN GURU SEKOLAH DASAR Pengenalan Anak Pengidap Disleksia. 7(2), 21–32.

Hanif, M. (2023). Assessment Evolution: Crafting Diagnostic Tests to Empower the Independent Curriculum in English Education at MTs Negeri 5 Brebes.

QALAMUNA: Jurnal Pendidikan, Sosial, Dan Agama, 15(2), 1139–1154. <https://doi.org/10.37680/qalamuna.v15i2.3655>

Hartono. (2015). Deteksi Dini Kesulitan Belajar pada Siswa Sekolah Dasar. Bumi Aksara.

Khaulani, Q. (2022). Upaya Guru Dalam Penanganan Siswa Disleksia. Didaktik : Jurnal Ilmiah PGSD STKIP Subang, 8(2), 893–902. <https://doi.org/10.36989/didaktik.v8i2.432>

Kobottolbox. (2024). Dasar-dasar KoboToolbox. Kobotoolbox. <https://support.kobotoolbox.org/welcome.html>

Lingkan Mandas, A., Sensanen, E., & Sensanen, E. (2022). Kesulitan Belajar Spesifik pada Anak SD Email: Sitasi. Pada Anak SD. Humanlight Journal of Psychology, 3(2), 114–124. <http://ejournal-iaknmanado.ac.id/index.php/humanlight>

Minsih. (2020). Pendidikan Inklusif Sekolah Dasar: Merangkul Perbedaan dalam Kebersamaan. MUP.

Mulyasa. (2014). Manajemen Pendidikan Karakter. Remaja Rosdakarya.

Munandar, U. (2012). Pengembangan Kreativitas Anak Berbakat. Rineka Cipta.

Nurfadhillah, S., Saridevita, A., Adji, A. S., Valentina, F. R., Astuty, H. W.,

Devita, N., & Destiyantari, S. (2022). Analisis Kesulitan Belajar Membaca (Disleksia) dan Kesulitan Belajar Menulis (Disgrafia) Siswa Kelas I SDN Tanah Tinggi 3 Tangerang. Masaliq, 2(1), 114–122. <https://doi.org/10.58578/masaliq.v2i1.94>

Parwoto. (2023). Asesmen dan Evaluasi Perkembangan dalam PAUD INKLUSI (T. Eldian (ed.)). Deepublish.

Parwoto. (2024a). Dasar-dasar Pendidikan anak berkebutuhan khusus. Deepublish.

Parwoto. (2024b). Metode Penelitian Dalam pendidikan. Deepublish.

Patricia, F. A., & Zamzam, K. F. (2019). DISKALKULIA (KESULITAN MATEMATIKA) BERDASARKAN GENDER PADA SISWA SEKOLAH DASAR DI

KOTA MALANG Pendidikan Matematika , IKIP Budi Utomo Malang Abstrak
PENDAHULUAN Anak merupakan salah satu karunia tak ternilai dari Sang Maha Setiap
anak memiliki kemampuan. 8(2), 288–297.

Putri, Y., & Sopandi, A. A. (2019). Pelaksanaan Identifikasi dan Asesmen Bagi Anak Berkesulitan Belajar di SD Negeri 63 Surabaya Lubuk Basung Kabupaten Agam. *Golden Age: Jurnal Ilmiah Tumbuh Kembang Anak Usia Dini*, 4(4), 27–34. <https://doi.org/10.14421/jga.2019.44-04>

Qodriyah. (2009). FAKTOR PENYEBAB KESULITAN BELAJAR BAHASA ARAB DI SEKOLAH MENENGAH PERTAMA (SMP) ISLAM PADOMASAN JOMBANG KABUPATEN JEMBER.

Solek, P. (2013). Mengenal Kesulitan Belajar Anak. Strategi Mengatasi Kesulitan Belajar Ketika Murid Anda Seorang Disleksia, 6.

Subini, N. (2012). Mengatasi Kesulitan Belajar Pada Anak. Javalitera.

Suhartono. (2016). Pembelajaran Menulis Untuk Anak Disgrafia di Sekolah Dasar. 12(2009), 107–119.

Suyadi. (2020). Psikologi Pendidikan. Remaja Rosdakarya.

Suyanto Slamet. (2010). Dasar-dasar Pendidikan Anak Berkebutuhan Khusus. Hikayat Publishing.

Wahyuningrum, H. (2023). Analisis Gaya Belajar Peserta Didik Ditinjau Dari Asesmen Pembelajaran Terhadap Kurikulum Merdeka *Jurnal Ilmu Pendidikan Nasional*. 1(April), 38–44.

Widodo, A., Affandi, L. H., Indraswati, D., & Hidayati, V. R. (2023). FUNGSIONAL BELAJAR SISWA MENGGUNAKAN APLIKASI KOBOTOOLBOX BAGI GURU SDN 21 CAKRANEGARA. 3(2), 126–131.