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Digital Literacy Transformation of Learners with Special Needs through TPACK Approach in IPAS Learning in Elementary School

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Abstract
Students with special needs, such as slow learners and dyslexia, experience challenges in filtering valid information. With this, digital literacy in slow learners and dyslexic students through the TPACK approach is a solution to this problem. This study aims to analyze the transformation of digital literacy of slow learners and dyslexic students through the TPACK approach in IPAS subjects, especially social studies. This research uses descriptive qualitative methods with data collection techniques: observation, interviews, and documentation. The results showed that the digital literacy of slow learners and dyslexic students increased significantly through interactive map technology, e-comic, and Google Classroom in social studies subjects. The results of this research are expected to contribute to developing more effective and inclusive technology. This research can also be a reference for educators using the TPACK approach to improve digital literacy.

Keywords: Digital Literacy, Dyslexia, IPAS, Slow Learner, TPACK

Introduction

In today's digital era, education is undergoing a significant transformation. Information and communication technology development has affected various aspects of life, including education. This transformation requires teachers and students to develop new competencies relevant to digital technology so that the learning process remains effective and meets the needs of the times (Dalimunthe, 2023). Information and communication technology has an increasingly decisive role in education. This requires incorporating literacy into the education curriculum. Digital literacy is accessing, understanding, critically evaluating and utilizing information wisely (Naila et al., 2021). In a broad sense, digital literacy includes more than just the skills to use digital devices but also includes an understanding of the ethics of using technology and the ability to think critically in the face of an ever-changing digital world (Cynthia & Sihotang, n.d.). In this era whole of information, students must be able to filter and sort out valid and valuable information from the abundance of information that is not important (Mukri & Rusydi, 2024).

The development of digital literacy in education still faces many challenges, especially for students with special needs. In the modern era characterized by the rapid flow of information and technology, digital literacy is an essential skill and a primary need to support successful learning in everyday life (Sormin et al., 2019). Digital literacy allows students to access information independently, understand content critically, and utilize technology to complete various learning tasks (Cynthia & Sihotang, 2023). For students with dyslexia and slow learners, digital literacy has an important role because it can open up opportunities to overcome their learning difficulties; they take longer to process information, quickly lose focus while learning and have challenges maintaining focus during the learning process (Chatib, 2012). Digital literacy is a bridge that helps overcome their limitations, but the technology must be designed and implemented interactively and flexibly according to their needs (Wahyuni et al., 2024). However, students with special needs often face more significant challenges accessing technology and information than regular students. These challenges include less inclusive technology design and a lack of understanding of the characteristics of their learning needs (Oktaviani & Harsiwi, 2024). The result is a digital literacy skills gap that limits the participation of students with special needs in technology-based learning and inhibits them from utilizing

technology (Tanjung et al., 2024). Therefore, a unique approach is needed that not only focuses on technology but also pays attention to the characteristics of the learning needs of students with special needs.

One approach that can be optimized to face this challenge is to use technological pedagogical content knowledge (TPACK). The TPACK approach integrates three elements: technology, pedagogy, and content knowledge to make learning more effective and adaptive to the needs of students with special needs (Anwar, 2023). By understanding these three elements, teachers can design inclusive learning strategies that do not focus on delivering material alone but also on involving students with special needs and utilizing technology as a learning tool that supports their needs (Rahmawati et al., 2024). When teachers integrate technology with sound pedagogy and content, students with special needs will be more actively involved in learning through activities encouraging them to explore and solve problems. In addition, TPACK also helps teachers develop their digital skills because teachers not only master the content but also must understand how to choose and use the right technology in the educational context (Zainil et al., 2022).

The TPACK approach allows teachers to use technology, especially in IPAS subjects, especially social studies. TPACK integration is very relevant because IPAS subjects, especially social studies, include aspects that can be optimized with the help of technology, such as understanding concepts that are difficult to understand. Using technology, geographical, social, and historical concept material can be presented visually and practically, so students with special needs find it easier to capture and remember information (Saputri Rahayu & Science of Education and Social Knowledge Geography Education Study Program, 2024). Technology facilitates the delivery of information and makes the learning approach more explorative (Pertiwi et al., 2022). Students with special needs can search for social studies concepts in their way and relate to the real world. Through this approach, social studies learning not only focuses on theoretical knowledge but also forms students with special needs who are ready to face the increasingly complex challenges of life (Sabila et al., 2024).

According to research conducted by (Destiyanti & Halawati, 2023), TPACK can facilitate the development of digital literacy in students with disabilities, focusing on how various technologies support the learning process tailored to individual differences. According to (Scherer et al., 2018),exploring the application of TPACK in improving students' digital literacy in different countries shows that this approach supports technology integration in the classroom. This research emphasizes the importance of TPACK integration, which suits today's digital needs, but this research focuses on regular students without special attention to students with special needs. However, research on the application of TPACK to students with special needs in IPAS subjects, especially social studies, is still limited. Therefore, it is necessary to conduct in-depth research on how this approach is applied and optimized in the educational context of students with special needs to improve their digital literacy. This research has a novelty: the TPACK approach for students with special needs, slow learners, and dyslexia in IPAS subjects, especially social studies in elementary schools.

The main focus of this research is how TPACK can transform the digital literacy skills of students with special needs. This study aims to analyze the transformation of digital literacy of students with special needs through the TPACK approach in IPAS subjects, especially social studies. This study is expected to contribute to the world of education, especially by optimizing the TPACK approach to improve the digital literacy of students with special needs. Teachers will also understand the importance of developing digital literacy that supports students' special needs.

Method

The research method used in this research is qualitative, using a descriptive approach. This research was conducted at SDN 1 Arjosari from July to October 2024 with the subject of research students with special needs, slow learners, and dyslexia class IV and teachers as a source of information to obtain accurate data. The collection methods used are interviews, observation, and documentation. The interview stage in this study aims to obtain accurate data from the fourth-grade teacher in implementing the TPACK approach to improve the digital literacy of students with special needs, slow learners, and dyslexia. The observation method was used to observe the actual situation in class IV. Documentation is used to support the research.

Data analysis in this study uses the Miles & Huberman flow, which consists of four processes, namely: 1) data collection, 2) data reduction, 3) data presentation, and 4) conclusion drawing (Sugiyono, 2013). The following is presented the flow and research techniques in the figure below:

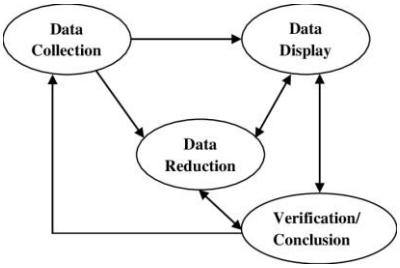

Figure 1. Data analysis using the Miles & Huberman flow

From the flow and research techniques above, the data collected is analyzed through data collection, reduction, presentation, and conclusion drawing. The data collection stage uses observation, interviews, and documentation. The data reduction stage is carried out by filtering the data and focusing on the research objectives, namely analyzing the digital literacy transformation of students with special needs through the TPACK approach in IPAS subjects, especially social studies. Furthermore, the data is presented as narratives or tables that facilitate analysis. The final stage is when the researcher concludes the results of the data analysis that has been carried out.

Results and Discussion

The results of this study describe changes in the level of digital literacy of students with special needs, types of slow learner disorders, and grade IV dyslexia before and after applying the TPACK approach in IPAS learning, especially in social studies in elementary schools. The data presented are obtained through observation, interviews, and documentation, with research focusing on two main aspects: the ability to use digital technology *(digital skill)* and the ability to use digital ethics *(digital ethics)*. The following table visualizes the study results to show the difference in the level of digital literacy of students with special needs of slow learners and dyslexia in grade IV before and after applying the TPACK approach.

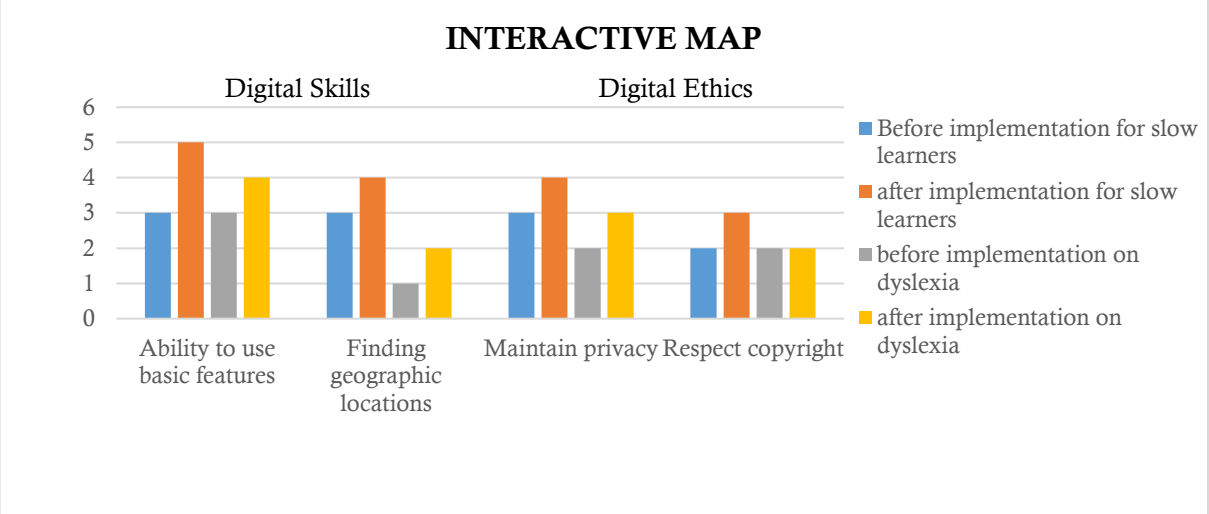

Diagram 1. Comparison of digital literacy levels on interactive map technology for slow learners and dyslexic students

This diagram shows the digital literacy skills of slow learners and dyslexic students before and after applying the TPACK approach through an interactive map platform, with two main aspects, namely *Digital Skills* and *Digital Ethics*. Slow learner students on the interactive map platform of the *Digital Skill* component of the indicator "ability to use basic features" (Alfaeni et al., 2022) showed a significant increase from a score of 3 to a score of 5, which means that before the application of basic skills in using digital devices already existed, but were still limited to essential functions and after the application of understanding and skills in using the basic features of interactive maps increased, such as zooming in and out of the display. The indicator "finding geographic locations" (Sumadikarta & Kurniadi, 2023) also increased from a score of 3 to a score of 4. This shows that, before implementation, slow learner students can identify essential locations but cannot utilize them optimally. However, after the application, they can identify and find geographic locations by searching for island names using features more precisely and quickly.

Meanwhile, for dyslexic students, the indicator "ability to use basic features" obtained a score of 3 to a score of 4 before the application. Dyslexic students were familiar with some basic features. However, they could not operate effectively, but after the application, students became more skilled in utilizing its basic features, such as navigating maps. On the indicator "finding geographical locations", I obtained a score of 1 to 2; despite the improvement, dyslexic students still struggle to recognize and determine geographical locations. This difficulty can be caused by the limited spatial understanding often experienced by dyslexic students.

In the *Digital Ethics* component, the indicator "maintaining privacy" (Thohir et al., 2023), slow learner students get a score of 3 to a score of 4, which shows that before the application of basic understanding related to the importance of maintaining privacy in the digital world is still not optimal. However, after the application, there has been an increase in awareness and understanding of the importance of maintaining privacy when using digital technology. On the indicator "respect for copyright" (Nandiansyah et al., 2022), obtained a score of 2 to a score of 3. This means that before the application of understanding of the importance of copyright, it was still at a low level. However, after applying slow learners, students began to understand the importance of respecting copyright and can apply it in daily activities.

Meanwhile, for dyslexic students, the indicator "maintaining privacy" scored 2 to 3. This reflects that before the application of dyslexic students' understanding was still limited, and they did not know the consequences. However, after the implementation, understanding the importance of maintaining personal data and following online security procedures improved. On the "respect for copyright" indicator, there was no improvement in the score of 2. This could be due to students' lack of understanding or attention to the importance of copyright in the digital context. For an improvement in this case, a more intensive approach is needed regarding copyright education and respect for digital works.

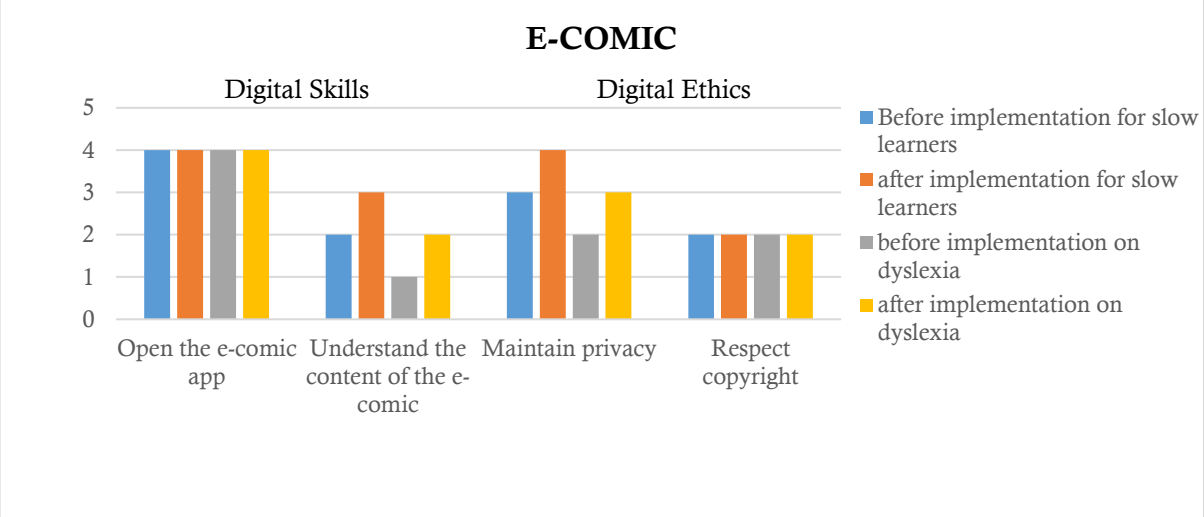

Diagram 2. Comparison of digital literacy levels on e-comic technology for slow learner and dyslexic students

This diagram shows the digital literacy skills of slow learners and dyslexic students before and after applying the TPACK approach through the e-comic platform, with two main aspects: *Digital Skills* and *Digital Ethics*. E-comic technology in the *Digital Skill* component of the indicator "opening the e-comic application" (Pinta & Yanti, 2024), before and after the application obtained a score of 4 on this indicator there was no change because slow learner students already had good basic skills and were familiar with the steps of opening the application. Before the application of understanding, the material's content was still relatively low due to the limited cognitive abilities of slow learner students, so it was not easy to follow the storyline and understand the message or information contained. Whereas the application shows that understanding the material's content is better, assistance is still needed to develop understanding. Meanwhile, for dyslexic students, the indicator "opening the e-comic application", the value of dyslexic students before and after using e-comic is 4; this shows that dyslexic students already have a pretty good ability to open the e-comic application. On the indicator "understanding the content of e-comic", dyslexic students obtained a score of 1 to a score of 2 before the application of understanding the content of e-comic is still very limited or even non-existent. The application showed a slight increase in understanding the e-comic content. This may be

due to the visual and narrative elements in the e-comic, which facilitate comprehension. However, it is not yet fully effective for dyslexic students and requires additional support to understand the material.

The Digital Ethics component*, the* indicator "maintaining the privacy of slow learner students, obtained a score of 3 and increased to a score of 4 before the application showed that students' understanding of the importance of maintaining privacy was still limited and needed to be improved. However, after implementing slow learners, students increasingly realize the importance of maintaining privacy in the digital world. Through training or introducing privacy features on the platform, slow learner students become more aware of maintaining personal data and safe interactions when using the application. This could be due to a lack of a deeper understanding of copyright issues in digital use, so a more concrete approach is needed to increase the awareness of slow learner students. Meanwhile, for dyslexic students, the indicator "maintaining privacy" obtained a score of 2 and increased to a score of 3 before applying dyslexic students' understanding of the importance of maintaining privacy, which was still quite basic. However, after the implementation, there was an increase in awareness of the importance of maintaining privacy when using digital platforms. This is due to the education on the platform or practical experience that increases dyslexic students' understanding of personal data protection. On the "respect for copyright" indicator, dyslexic students scored 2, meaning that students do not yet understand the importance of respecting copyright due to a lack of understanding of the risks of copyright infringement. Therefore, despite improvements in several other indicators, dyslexic students' understanding of respecting copyright still needs attention.

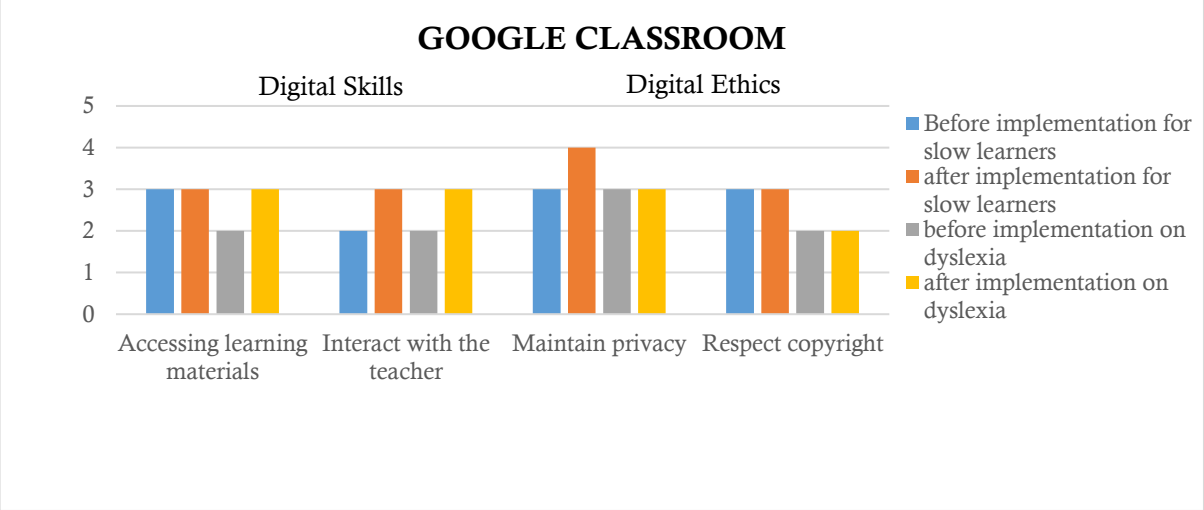

Diagram 3. Differences in the level of digital literacy on Google Classroom technology for slow learners and dyslexic students

This diagram shows the digital literacy skills of slow learners and dyslexic students before and after applying the TPACK approach through the e-comic platform, with two main aspects: *Digital Skills* and *Digital Ethics.* Google classroom technology in the *Digital Skill* component of the indicator "accessing learning materials" (Utami, 2019), before and after using this platform, slow learner students scored 3. This shows that using Google Classroom does not significantly change this ability. However, this lack of change is due to slow learner students' lack of accuracy in reading material titles, which causes them to sometimes access the wrong material. On the indicator "interacting with the teacher" (Supriyanto et al., 2023), slow learner students obtained a score of 2 and increased to a score of 3. Before implementing a slow learner, students' scores were still low due to a lack of communication confidence. After the implementation, an improvement showed that this platform facilitated more effective communication between students and teachers. Google Classroom allows slow learner students to submit assignments, ask questions, and receive teacher feedback more efficiently. This improvement indicates that slow learners are becoming more comfortable and accustomed to interacting online.

Meanwhile, for dyslexic students, the indicator "accessing learning materials" increased from a score of 2 to a score of 3. Before the implementation, students had not fully mastered using Google Classroom to find and open materials provided by the teacher. After the implementation, there was an increase in scores, indicating that this platform made it easier for dyslexic students to find and understand materials, possibly due to the structured interface or helpful search features. Then, on the "interacting with the teacher" indicator, students scored 2, which increased to 3 before implementation. Students still had difficulty communicating through digital platforms. After implementation, the score increased due to the comment feature or

discussion room in Google Classroom, which allowed dyslexic students to ask questions or ask for help more quickly.

The *Digital Ethics* component of the indicators "maintaining privacy" and "respecting copyright" before the application of students obtained a score of 3, meaning that they were quite capable of understanding the importance of maintaining privacy and respecting copyright even though they still needed to be improved. Meanwhile, there was an increase in the indicator "maintaining privacy," namely a score of 4. This increase is due to slow learner students' better understanding of the importance of maintaining personal data and sensitive information when using digital platforms. Google Classroom, designed with security and privacy features, can positively influence slow-learner students' awareness of the importance of keeping their personal information private. On the indicator "respect for copyright," there was no change in the score, which remained at 3, indicating that slow learner students have a sufficient understanding of respecting copyright, but awareness of respecting copyright still needs to be improved through further learning. Whereas for dyslexic students, the indicator "maintaining privacy", the student's score did not change, namely a score of 3, which means that students have a pretty good understanding of the importance of maintaining privacy in the digital world. On the "respecting copyright" indicator, students' scores did not change, namely a score of 2. This shows that students' understanding is still limited and lacking, and Google Classroom may not directly support the strengthening of this indicator.

These three digital platforms used in IPAS learning, especially social studies, are proven to improve students' digital literacy, especially for slow and dyslexic learners. Using technologies such as interactive maps, e-comics, and Google Classroom can increase students' interest in understanding and digital skills in an inclusive and accessible way. Interactive maps allow students with special needs to explore geographical locations in depth through features such as zoom, pan, and audio (Martiningsih, 2023). These interactive features allow students with special needs to learn independently and actively. With clear visualizations and accessible models, slow learners and dyslexic students can capture information faster than text or verbal explanations alone (Suprihatiningrum et al., 2021). E-commerce technology provides a combination of text and images to convey information engaging and easy-to-follow manner (Farahtika, 2023). For slow learners and dyslexic students, e-comics can reduce reliance on long texts and help them visualize concepts more clearly (Daulay, 2020). Finally, Google Classroom is a digital platform that allows students to access learning materials, submit assignments, and receive feedback (Atikah et al., 2021). Google Classroom also provides features that allow students to access materials at any time and learn at their own pace (Patandean & Indrajit, 2021). Implementing these three technologies requires a framework integrating technology with appropriate learning approaches.

One relevant approach to support their needs is the *Technological Pedagogical Content Knowledge (TPACK)* approach. The TPACK approach is a framework that combines three important elements in an educational context: technological *knowledge*, *pedagogical* knowledge, and content knowledge (Surahman et al., 2020). Technology includes digital tools and platforms to support teaching and learning, pedagogy focuses on practical learning strategies and methods, and content refers to relevant learning materials (1(et al., 2024). Integrating these three elements allows teachers to design dynamic, interactive and relevant learning experiences for students with special needs (Riniwanti et al., 2024). TPACK plays an important role in improving the accessibility and engagement of students with special needs. This approach facilitates a more inclusive learning experience, where technology creates more engaging and comprehensible learning opportunities for students with special needs (Mukhid, 2023). However, the success of this approach relies heavily on understanding student characteristics. For example, slow learners and dyslexic students with special needs require appropriate technology adjustments.

Slow learners and dyslexic students face particular learning challenges. The slow learner students in this school have difficulty understanding learning materials at their age level. They will need extra time to understand instructions and complete the tasks given. This aligns with the thinking (Elti et al., 2024): slow learner students are slow in learning, so they take longer than regular student groups with the same intellectual potential level. Slow learner students have distinctive characteristics: the ability to complete slow tasks, obstacles in understanding academic concepts, and difficulties actively participating in interaction (Fitriana et al., n.d.). In addition, they also face difficulties in organizing time and tasks, requiring support in developing time management skills and more structured learning strategies (Rahayu et al., 2023).

On the other hand, dyslexic students in this school show difficulties in reading and writing. They struggled with spelling and reading comprehension despite having good intellectual abilities. Dyslexic students have cognitive disorders in the form of an inability to read and difficulty recognizing letters that are almost the same. In his eyes, the writing is a scribble that is difficult to read (Primasari & Supena, 2021a). Dyslexic

students have a good IQ and other abilities, but in terms of reading, they will experience difficulties (Komalasari, 2015). The difficulties experienced are not caused by social, emotional, or educational factors but are caused by neurological factors that affect students in processing information (Primasari & Supena, 2021). With the utilization of technology to support the learning of slow learners and dyslexic students, it is important to pay attention to other aspects that will underlie the successful use of technology, namely digital literacy. In this case, digital literacy is an important aspect because there are technologies that offer more interesting ways to interest students in literacy.

Digital literacy is a skill that includes the capacity to use technology, information, and communication tools, the ability to socialize, learn, and have attitudes, and the ability to think critically, creatively, and inspiringly (Nawaf et al., 2023). Meanwhile, the concept of digital literacy developed by UNESCO is a skill (life skill) that includes not only the ability to use technology, information and communication devices but also social skills, namely the ability to learn and adopt critical, creative, inspiring ways of thinking (Lia Tasliah et al., 2024). According to (Road-Map-Reform-Bureaucracy-Kominfo-Year-2020-2024-1, n.d.)Digital literacy includes four components, namely: 1) the ability to use digital technology *(Digital Skill)* is the ability of individuals to know, understand, and use hardware and software and digital operating systems in everyday life; 2) digital culture *(Digital Culture)* is the ability of individuals to read, decipher, familiarize, examine, and build national insight, the values of Pancasila and Unity in Diversity in everyday life, 3) digital *ethics* is the ability to realize, exemplify, adapt, rationalize, consider, and develop digital ethical governance in daily life, and 4) security literacy *(Digital Safety)* is the ability to recognize, apply, analyze, consider and increase awareness of personal data protection and security in daily life.

This research on digital literacy provides important insights for education, especially in preparing students with special needs to face the challenges of the digital era. Teachers can integrate digital literacy into various subjects through digital tools that support various learning models, such as project-based, collaborative, and problem-based learning (Akbar et al., 2023). Learning materials should be designed to engage students in activities that promote the development of digital skills (Mega, 2022). In addition, teachers should attend training on how to use technology effectively and inclusively in the classroom. This training could include strategies to educate students about personal data protection and digital ethics (Mahka et al., 2023).

The curriculum must also integrate digital literacy as an integral part of basic education with a holistic approach that includes skills, culture, ethics and digital safety (Pare & Sihotang, 2023). Education policies should also encourage equitable access to technology for students, including students with special needs, so they are not left behind in developing digital literacy. Strong digital can help students who are not only using technology but can also become socially and ethically responsible individuals (Said, 2023). Digital literacy for slow learners and dyslexic students has an important role in supporting learning as it provides more flexible and effective access (Setiani & Barokah, 2021). The technologies used, such as interactive maps, e-comics, and Google Classroom, allow students to access materials at any time and can be adapted to their learning styles (Herni et al., 2022). For slow learners, digital literacy offers a learning platform at an affordable pace and helps them understand complex concepts (Sunandi et al., 2023). As for dyslexic students, technology for digital literacy can overcome barriers by opening up opportunities to actively participate in learning (Turnip, 2023). Digital literacy not only helps students understand the material but can also improve their skills in using digital devices. Thus, digital literacy facilitates academic understanding and prepares slow learners and dyslexic students to adapt to future social challenges (Paramansyah & Parojai, 2024). This research has proven an increase in the digital literacy of slow learners and dyslexic students through the TPACK approach using interactive map platforms, e-comics, and Google Classroom. However, this research can still be limited to only one elementary school, so a broader scope is needed to enrich the results. Future research is expected to involve more research locations and explore more adaptive technologies.

Conclusion

The results of this study can be concluded that digital literacy in slow learners and dyslexic students through the TPACK approach in IPAS subjects, especially social studies, shows a significant increase in material understanding, digital skills, and student involvement in the learning process. Technology such as interactive maps, e-comics, and Google Classroom proved effective in overcoming the cognitive limitations of students with special needs and providing opportunities for them to learn at a pace and style that suits their needs. This research recommends that teachers continuously develop relevant technological competencies to create effective and inclusive learning. In addition, education policy should support continuous training for teachers and ensure wider access to technology that supports students with special needs. It is important for educators to provide an understanding of creating inclusive and effective learning for students with special needs.

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References

1∗, S., Lidya Sumarni, M., Victor, T., Saputro, D., Guru, P., Dasar, S., & Bhuana, S. (2024). Pengaruh Kompetensi Technological Pedagogical Content Knowledge (TPACK) terhadap Keterampilan Guru dalam Mengimplemtasikan Pembelajaran Berbasis Digital. In *Journal of Education Research* (Vol. 5, Issue 4).

Akbar, J. S., Dharmayanti, P. A., Nurhidayah, V. A., Lubis, S. I. S., Saputra, R., Sandy, W., Maulidiana, S., Setyaningrum, V., Lestari, L. P. S., & Ningrum, W. W. (2023). *Model & Metode Pembelajaran Inovatif: Teori Dan Panduan Praktis*. PT. Sonpedia Publishing Indonesia.

Alfaeni, D., Nurkanti, M., & Halimah, M. (2022). Kemampuan kolaborasi siswa melalui model project based learning menggunakan zoom pada materi ekosistem. *BIOEDUKASI: Jurnal Pendidikan Biologi*, *13*(2), 143–149.

Anwar, R. (2023). *Bimbingan Klasikal Hots Dan Tpack Dalam Kurikulum Merdeka: Suatu Pendekatan Best Practice*. Feniks Muda Sejahtera.

Atikah, R., Prihatin, R. T., Hernayanti, H., & Misbah, J. (2021). Pemanfaatan google classroom sebagai media pembelajaran di masa pandemi covid-19. *PETIK: Jurnal Pendidikan Teknologi Informasi Dan Komunikasi*, *7*(1), 7–18.

Chatib, M. (2012). *Sekolah anak-anak juara: berbasis kecerdasan jamak dan pendidikan berkeadilan*. Kaifa.

Cynthia, R. E., & Sihotang, H. (n.d.). *Melangkah Bersama di Era Digital: Pentingnya Literasi Digital untuk Meningkatkan Kemampuan Berpikir Kritis dan Kemampuan Pemecahan Masalah Peserta Didik*.

Cynthia, R. E., & Sihotang, H. (2023). Melangkah bersama di era digital: pentingnya literasi digital untuk meningkatkan kemampuan berpikir kritis dan kemampuan pemecahan masalah peserta didik. *Jurnal Pendidikan Tambusai*, *7*(3), 31712–31723.

Dalimunthe, D. S. (2023). Transformasi Pendidikan Agama Islam: Memperkuat Nilai-nilai Spiritual, Etika, dan Pemahaman Keislaman dalam Konteks Modern. *Al-Murabbi Jurnal Pendidikan Islam*, *1*(1), 75–96.

Daulay, M. I. (2020). *Belajar IPS Dengan Komik? Kenapa Tidak*.

Destiyanti, I. C., & Halawati, F. (2023). *TPACK Approach in the Context of Special Needs Students: Reflections from the Field* (pp. 86–96). https://doi.org/10.2991/978-94-6463-236-1_10

Elti, Y., Rahmi, A., Studi Bimbingan Dan Konseling, P., & Tarbiyah Dan Ilmu Keguruan, F. (2024). Peran Guru Bimbingan Konseling Dalam Membimbing Peserta Didik Slow Learner Di Sekolah Menengah Atas (SMA) Negeri 2 Kinali Pasaman Barat. *INNOVATIVE: Journal Of Social Science Research*, *4*, 7117–7126.

Farahtika, A. (2023). PENINGKATAN MINAT BACA MELALUI MODEL PROJECT BASED LEARNING. *SOCIAL STUDIES*, *8*(2).

Fitriana, D., Irmata Putri, R., FajriN, E., & An Shoriah, K. (n.d.). *Tinjauan Terhadap Paradigma Pengembangan Anak: Strategi Pendidikan Untuk Memperkuat Potensi Siswa Slow Learner DI SDN 03 Alai*.

Herni, H., Waspodo, M., & Wibowo, S. (2022). *MONOGRAF PENGEMBANGAN MEDIA INTERAKTIF BERBASIS ANDROID*.

Komalasari, M. D. (2015). *Metode multisensori untuk meningkatkan kemampuan membaca pada peserta didik disleksia di sekolah dasar*.

Lia Tasliah, A., Nuraeni, A., & Fauzi Rachman, I. (2024). LITERASI DIGITAL: KUNCI MENUJU PENDIDIKAN BERKUALITAS MELALUI PERSPEKTIF SDGS 2030. *Jurnal Multidisiplin Ilmu Akademik*, *1*(3), 154–165. https://doi.org/10.61722/jmia.v1i3.1385

Mahka, M. F. R., Umar, N., Zuhriyah, S., & Sukanda, N. L. (2023). Strategi Hukum Preventif dalam Meningkatkan Perlindungan Anak di Era Digital. *Prosiding SISFOTEK*, *7*(1), 371–379.

Martiningsih, D. (2023). E-PUB SEBAGAI TEKNOLOGI PENDUKUNG PEMBELAJARAN BAGI PENYANDANG DISABILITAS NETRA. *OPTIMALISASI PEMANFAATAN TEKNOLOGI PEMBELAJARAN*, *31*.

Mega, K. I. (2022). Mempersiapkan Pendidikan di Era Tren Digital (Society 5.0). *Jurnal BELAINDIKA (Pembelajaran Dan Inovasi Pendidikan)*, *4*(3), 114–121.

Mukhid, M. P. (2023). *Disain Teknologi Dan Inovasi Pembelajaran Dalam Budaya Organisasi Di Lembaga Pendidikan*. Pustaka Egaliter. Com.

Mukri, R., & Rusydi, L. N. (2024). EDUKASI DISMIS INFORMASI UNTUK MENINGKATKAN LITERASI DIGITAL SISWA SMP PGRI TENJOLAYA KABUPATEN BOGOR. *RAMBIDEUN: Jurnal Pengabdian Kepada Masyarakat*, *7*(2), 155–162.

Naila, I., Ridlwan, M., & Haq, M. A. (2021). Literasi digital bagi guru dan siswa sekolah dasar: Analisis konten dalam pembelajaran. *Jurnal Review Pendidikan Dasar: Jurnal Kajian Pendidikan Dan Hasil Penelitian*, *7*(2), 122–166.

Nandiansyah, A., Raihana, R., & Berlian, C. (2022). Kesadaran Hukum Perlindungan Hak Cipta Bagi Pengguna Karya Cipta Sinematografi Pada Media Internet. *SEIKAT: Jurnal Ilmu Sosial, Politik Dan Hukum*, *1*(2), 77–87.

Nawaf, A., Azura, S., Gultom, S. F., Afriansyah, W., & Putra, A. D. (2023). Analisis Literasi Digital Dalam Penggunaan Media Sosial Di Kalangan Remaja Desa Payung Kec. Payung Kab. Karo. *Arya Dwi Putra Journal of Human And Education*, *3*(2), 337.

Oktaviani, F., & Harsiwi, N. E. (2024). Tantangan Pembelajaran Anak Berkebutuhan Khusus di Kelas Inklusi SDN Gebang 1. *Journal of Special Education Lectura*, *2*(1), 24–30.

Paramansyah, A., & Parojai, M. R. (2024). *Pendidikan Inklusif Dalam era Digital*. Penerbit Widina.

Pare, A., & Sihotang, H. (2023). Pendidikan Holistik untuk Mengembangkan Keterampilan Abad 21 dalam Menghadapi Tantangan Era Digital. *Jurnal Pendidikan Tambusai*, *7*(3), 27778–27787.

Patandean, Y. R., & Indrajit, R. E. (2021). *Flipped classroom: Membuat peserta didik berpikir kritis, kreatif, mandiri, dan mampu berkolaborasi dalam pembelajaran yang responsif*. Penerbit Andi.

Pertiwi, A. D., Nurfatimah, S. A., & Hasna, S. (2022). Menerapkan metode pembelajaran berorientasi student centered menuju masa transisi kurikulum merdeka. *Jurnal Pendidikan Tambusai*, *6*(2), 8839–8848.

Pinta, Y., & Yanti, S. (2024). Pembelajaran Berdiferensiasi dengan E-Comic Interaktif Kumbuah Meningkatkan Literasi di Kelas Inklusi. *Edusainstika: Jurnal Pembelajaran MIPA*, *4*(1), 29–37.

Primasari, I. F. N. D., & Supena, A. (2021a). Meningkatkan Kemampuan Membaca Siswa Disleksia Dengan Metode Multisensori Di Sekolah Dasar. *Jurnal Basicedu*, *5*(4), 1799–1808. https://doi.org/10.31004/basicedu.v5i4.1055

Primasari, I. F. N. D., & Supena, A. (2021b). Meningkatkan Kemampuan Membaca Siswa Disleksia Dengan Metode Multisensori Di Sekolah Dasar. *Jurnal Basicedu*, *5*(4), 1799–1808.

Rahayu, A. W., Januar, H., Miyono, N., & Khasanah, S. K. (2023). Analisis Kesulitan Belajar Siswa Berkebutuhan Khusus Slow Learner di SDN Karanganyar Gunung 02. *Jurnal Pendidikan Dan Konseling (JPDK)*, *5*(2), 2471–2480.

Rahmawati, L., Suharni, S., Ambulani, N., Febrian, W. D., Widyatiningtyas, R., & Rita, R. S. (2024). Pemanfaatan Aplikasi Canva Dalam Penyusunan Media Pembelajaran Berbasis Teknologi. *Community Development Journal: Jurnal Pengabdian Masyarakat*, *5*(1), 129–136.

Riniwanti, R., Nursalam, N., & Arifin, J. (2024). Pengembangan Media Audio Visual Interaktif Berbasis Kinemaster dalam Pembelajaran IPS pada Peserta Didik Kelas V UPTD SDN 14 Samanggi Kabupaten Maros. *Jurnal Pendidikan Dan Pembelajaran Indonesia (JPPI)*, *4*(1), 263–277.

Road-Map-Reformasi-Birokrasi-Kominfo-Tahun-2020-2024-1. (n.d.).

Sabila, F. N., Nurbaiti, I. S., Fauziah, K., Shalihat, Q., & Rustini, T. (2024). Peran Pembelajaran IPS dalam Pengembangan Karakter dan Sosial pada Anak Sekolah Dasar. *Jurnal Pendidikan Tambusai*, *8*(2), 22479–22484.

Said, S. (2023). Peran teknologi digital sebagai media pembelajaran di era abad 21. *Jurnal PenKoMi: Kajian Pendidikan Dan Ekonomi*, *6*(2), 194–202.

Saputri Rahayu, M., & Ilmu Pendidkan dan Pengetahuan Sosial Program Studi Pendididkan Geografi, F. (2024). PENGEMBANGAN MEDIA PEMBELAJARAN GEOGRAFI BERBASIS APLIKASI CANVA DALAM BENTUK POSTER DI KELAS X SMA NEGERI 2 SIMPANG HILIR. In *Geo Khatulistiwa : Jurnal Pendidikan Geografi dan Pariwisata* (Vol. 4, Issue 1).

Scherer, R., Tondeur, J., Siddiq, F., & Baran, E. (2018). The importance of attitudes toward technology for pre-service teachers' technological, pedagogical, and content knowledge: Comparing structural equation modeling approaches. *Computers in Human Behavior*, *80*, 67–80.

Setiani, N. N., & Barokah, N. (2021). Urgensi literasi digital dalam menyongsong siswa sekolah dasar menuju generasi emas tahun 2045. *Prosiding SEMAI: Seminar Nasional PGMI*, *1*, 411–427.

Sormin, S. A., Siregar, A. P., & Priyono, C. D. (2019). *Konsepsi Literasi Digital Dalam Pembelajaran Sejarah di Era Disruptif*.

Sumadikarta, I., & Kurniadi, O. (2023). SISTEM INFORMASI GEOGRAFIS BERBASIS LOCATION BASED SERVICE UNTUK PENCARIAN WILAYAH KRISIS PANGAN. *JURNAL LIMITS*, *20*(2), 60–72.

Sunandi, I., Juliati, J., Hermawan, W., & Ramadhan, G. (2023). Dampak Integrasi Teknologi pada Pengalaman Belajar Mahasiswa Perguruan Tinggi. *Jurnal Pendidikan Tambusai*, *7*(1), 3046–3054.

Suprihatiningrum, J., Jahidin, A., Aminah, S., & Hanjarwati, A. (2021). *PANDUAN MODIFIKASI KURIKULUM PERGURUAN TINGGI: Pendekatan Universal Design for Learning (UDL) dan Adaptasi*. Suka Press.

Supriyanto, S., Ibrahim, J. S., Novarida, D., Rahmah, H. R. F., & Firdaus, F. F. (2023). Penggunaan Google Classroom terhadap Motivasi Belajar Peserta Didik SMP di Era Disrupsi Pendidikan. *Jurnal Multidisiplin Indonesia*, *2*(7), 1470–1476.

Surahman, E., Sulthoni, S., Ulfa, S., Husna, A., Ramdiana, H., Thaariq, Z. Z. A., Setiawan, A. B., & Qolbi, M. S. (2020). Pelatihan Micro Learning Object Berbasis TPACK bagi Guru-Guru SMA di Garut. *Abdimas Pedagogi: Jurnal Ilmiah Pengabdian Kepada Masyarakat*, *3*(1), 1–14.

Tanjung, A. Q., Suciptaningsih, O. A., & Asikin, N. (2024). Urgensi Etika Dalam Literasi Digital Di Era Globalisasi. *WASIS: Jurnal Ilmiah Pendidikan*, *5*(1), 32–41.

Thohir, M., Reditiya, V. E., & Sari, N. I. P. (2023). Refleksi mahasiswa dalam berkeadaban digital melalui ChatGPT. *Intelektual: Jurnal Pendidikan Dan Studi Keislaman*, *13*(2), 109–128.

Turnip, R. S. (2023). Peningkatan Literasi Digital di Kalangan Pelajar: Pengenalan dan Praktik Penggunaan Teknologi Pendidikan. *Jurnal Review Pendidikan Dan Pengajaran (JRPP)*, *6*(4), 2302–2310.

Utami, R. (2019). Analisis respon mahasiswa terhadap penggunaan google classroom pada mata kuliah psikologi pembelajaran matematika. *Prisma, Prosiding Seminar Nasional Matematika*, *2*, 498–502.

Wahyuni, D. S., Karisma, N. A. M., & Rachman, I. F. (2024). MEMAHAMI STRATEGI, TANTANGAN, DAN SOLUSI PENGINTEGRASIAN LITERASI DIGITAL DALAM KURIKULUM INKLUSIF UNTUK SDGs 2030. *JURNAL ILMIAH RESEARCH STUDENT*, *1*(5), 230–243.

Zainil, M., Putra, A. P., & Saúd, U. S. (2022). *Pengembangan Model Pedagogy Digital Tematis Berbasis Literasi di Sekolah Dasar: Program Riset Kolaborasi Indonesia*.