ETDC Indonesian Journal of Research and Educational Review
Volume 4, No. 3, 2025, pp 696 - 706
e–ISSN 2809-3682
p–ISSN 2809-7505

https://doi.org/10.51574/ijrer.v4i3.3329

Development of Cultural Arts Learning Media from Corn Husk Waste Materials for Students with Special Needs

Hasdiana[1] , Suleman Dangkua[2]
[1, 2] Department of Visual Arts Education, Universitas Negeri Gorontalo, Indonesia

Article Info

Article history:

Received April 08, 2025
Revised June 16, 2025
Accepted June 21, 2025

Keywords:

Corn Husk;
Art and Culture;
Extraordinary School:
Instructional Media.

ABSTRACT

Extraordinary School is a formal educational institution that provides education specifically for children with special needs. One of the subjects taught at Public Extraordinary School Gorontalo is art and culture. There are difficulties experienced by teachers in the art and culture subject for students at Extraordinary School because so far there has been no special media used to teach the art and culture subject, where subject teachers must present material with different student disabilities. This study intends to determine the potential of corn husk fiber as a learning medium for children with special needs at Public Extraordinary School Gorontalo. The method used in this study is the creation method. The creation process consists of several stages, namely stage exploration, stage improvisation, and stage formation. The results of this basic research indicate that there are new findings in the form of a formulation of the concept of a trial of making and using corn husks as one of the raw materials that are the basic materials for making learning media in the form of teaching aids equipped with Braille letters and can be used as an aid in the teaching and learning process in the art and culture subject, visual arts material, and the main topic of decorative variety for blind students at Public Extraordinary School Gorontalo.

Corresponding Author:

Hasdiana,
Department of Visual Arts Education, Universitas Negeri Gorontalo, Indonesia
Email: has_diana@ung.ac.id

1. INTRODUCTION

Children with special needs who study at Extraordinary School are children who have different characteristics from one another and who require special education services that are tailored to their abilities and potential (Zigmond & Kloo, 2017; Lemons et al., 2018). The various special needs (disabilities) of extraordinary school students are mental retardation (mental delay), emotional disorders, deafness (hearing impairment), blindness (visual impairment), physical disability (physical movement disorders), and multiple disabilities (multiple disorders) (Gierczyk & Hornby, 2021; Lenvik et al., 2022; Siahaan, 2022).

Learning is a complex process that occurs in everyone throughout their life (Duran, 2016). The teaching and learning process is fundamentally a communication process,

which involves delivering messages from the message source, through specific channels or intermediaries, to the message recipient (Moto, 2019). In the teaching and learning process, the message is in the form of teaching materials delivered by the teacher, while the channel or intermediary used to deliver the message/teaching material is learning media, also known as instructional media. In the communication process, media is only one of four components that must be present. The other components are sources of information, information, and recipients of information. If one of the four components is missing, the communication process is impossible.

Generally, different educational media facilitate the teaching and learning process (Alwi et al., 2024). According to Dell'Anna et al. (2019), to achieve the expected learning outcomes, each of the special needs students requires different learning methods. Children with significant needs experience abnormalities or deviations (physical, mental-intellectual, social, and emotional) in their growth and development process compared to other children of the same age, so that in learning they require special educational services (Nurwidyayanti, 2022; Budiarti et al., 2023). This opinion suggests that we cannot equate the education of special needs students with that of students in public schools. According to Anderson and Valero (2020), there is a need for additional learning media tailored to the unique characteristics of students in Extraordinary Schools. Therefore, we must specifically design learning devices for extraordinary school students based on the characteristics of their disorders.

The classification of learning media indicates that each medium has its own unique characteristics. The learning media's ability to stimulate the senses of sight, hearing, touch, taste, and smell is a key indicator of these characteristics (Alkasasbeh & Ghinea, 2020; Di Fuccio et al., 2024). With these characteristics, a learning medium that will be used by a teacher when carrying out the teaching and learning process can be adjusted to a certain situation. In connection with these factors in this study, a selection of the type of learning media that will be used for teaching will be carried out according to the type of disability in Extraordinary School students in Gorontalo City.

According to data from the Central Statistics Agency in 2017, the number of children with special needs in Indonesia reached 1.6 million (Simorangkir & Lumbantoruan, 2021). In terms of providing educational facilities, the government has prepared special schools for children with special needs, namely Extraordinary School (ES) (Widana et al., 2023). Public Extraordinary School Gorontalo, as an education provider for children with special needs, is the first extraordinary school in Gorontalo Province with Operational Decree 1910-01-01, NPSN 58570014. Extraordinary School in Gorontalo serves students according to their groups, namely, ES-A for the blind, ES-B for the deaf, ES-C for the mentally retarded, ES-D for the physically impaired, ES-E for the emotionally impaired, and ES-F for the speech impaired, with educational levels of Elementary Extraordinary School, Middle School Extraordinary School, and High School Extraordinary School led by a principal (Profile of SLB Negeri Kota Gorontalo, 2023).

One of the subjects taught at Extraordinary School in Gorontalo is art and culture. Special schools also teach the subjects of art and culture, in addition to regular schools.

However, there are difficulties experienced by teachers in the art and culture subject for students at Extraordinary School because so far there has been no special media used to teach the art and culture subject, especially for blind students with limited vision (low vision and blind) who, in studying visual arts, rely on visual aspects. Due to their limited vision, students often struggle to comprehend the material.

To address these problems, this study attempts to develop art and culture learning media, especially visual arts materials, that are relevant to the specific needs of students, particularly blind students. An important principle in providing learning for blind students is that learning must use media that can use other senses besides sight. The media used include Braille letters and tactile devices that use the sense of touch and audio media that use the sense of hearing.

According to Mahludin, corn is a leading commodity of Gorontalo Province because it is a special commodity found in every sub-district and district/city—almost 53.73% of corn is found in every sub-district in Gorontalo Province (Hasdiana & Ayuddin, 2017). The data presented shows that corn has been able to provide a positive impact on increasing the economic sector of the community and provide quite significant regional income. In addition to being a source of carbohydrates, corn is also planted as animal feed (greens and cobs), its oil is taken (from seeds), it is made into flour (from seeds, known as corn flour or cornstarch), and it is used as an industrial raw material (from seed flour and cob flour). Corn cobs are rich in pentose, which is used as a raw material for making furfural.

Meanwhile, waste is waste produced from a production process, both industrial and domestic (household) (Artiola, 2019; Rene et al., 2021). This waste is considered undesirable by the environment at specific times and locations because it lacks economic value. When viewed chemically, this waste consists of organic and inorganic chemicals. With certain concentrations and quantities, the presence of waste can have a negative impact on the environment, especially on human health, so waste management is necessary.

The corn husk waste in this study is the leftover waste from corn that has been removed from the kernels, leaving the husk as waste material. Corn husk has a rough texture, making it suitable as a raw material for creating learning media for blind students.

We will develop learning media from corn husk waste materials specifically for Extraordinary School A students. This study's results will help optimize learning achievements in art and culture, specifically in visual arts, at Extraordinary School by creating learning media from easily obtainable basic materials. This approach serves as an alternative method to utilize waste materials for developing educational resources.

2. METHOD

The method used in this study is the creation method because this study will open up opportunities to identify a formulation of the concept of a trial of making and using corn husks as a learning medium that can be used as an aid in the teaching and learning

process in the subject of art and culture, visual arts material: decorative arts, at Extraordinary School Gorontalo. This trial concept formulation can be an alternative to creating learning media according to the needs of Extraordinary School students. In general, the creation process consists of several stages: exploration, improvisation, and formation. Hawkins describes this method and incorporates these stages (Hawkins, 2015). The following is a presentation of the creation process model in Figure 1.

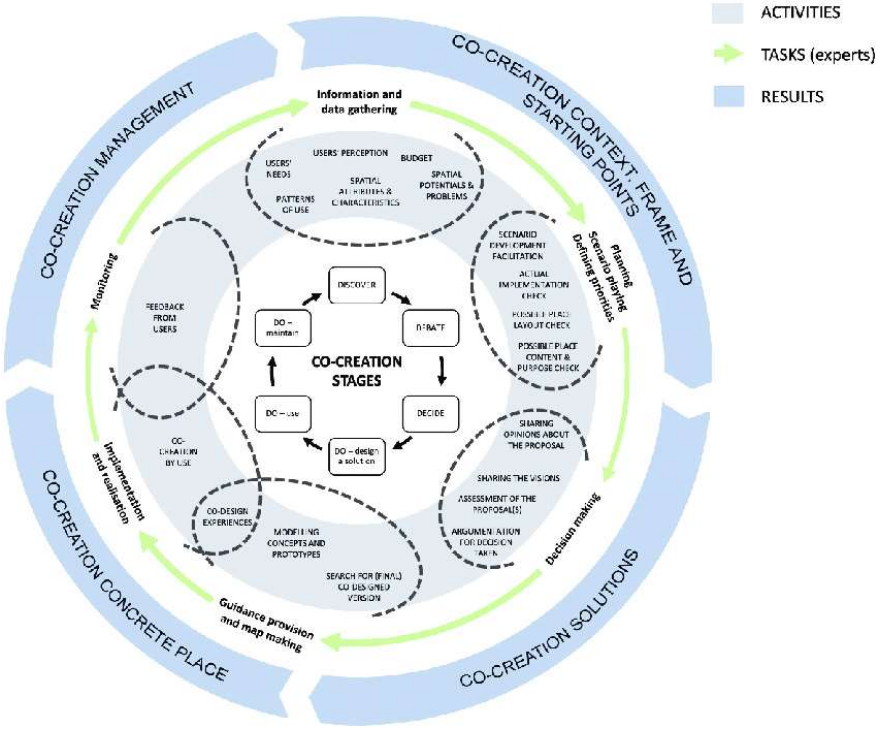


Figure 1. Creation Process

3. RESULTS AND DISCUSSION

Results

We conducted observations through literature studies, documentation, or other relevant supporting data to obtain all these descriptions. After the required data was deemed sufficient, studies were conducted, literature reviews from several sources were made, and considerations were made to determine which ideas were most likely to be realized in this learning media in accordance with the idea of creating media that is appropriate for blind students. The study will proceed in stages.

Stage 1: Exploration

Data obtained from Extraordinary School in the year 2023/2024 lessons are available for several types of disabilities in Extraordinary School students in Gorontalo City, and 3 Extraordinary School students are blind, as can be seen in Table 1 below:

Table 1. Extraordinary School Student Data

Student Data of State Extraordinary School															
Class	**Level**	**A**	**B**	**C**	**C1**	**D**	**D1**	**Autism**	**Down Syndrom**	**G**	**F**	**Gender**		**Amount**	**Total**
												M	**F**		
I	Elementary School		1	4		2		3				5	5	10	124
II			3	16		6		4				13	16	29	
III	Extraordinary School		2	8				4				5	9	14	
IV			4	12		3		3				12	10	22	
V		1	9	14				2				19	8	27	
VI			6	14		1		1				7	15	22	
VII	Middle School Extraordinary School		3	12	1	5						11	10	21	61
VIII			3	13	4							15	5	20	
IX		1	5	14								9	11	20	
X	High School		5	17	1	1						17	6	23	40
XI	Extraordinary School		2	3	2	1						3	5	8	
XII		1	3	2		3						3	6	9	
		3	46	129	8	22	0	17	0	0	0	119	106	225	225

Note:

A: Blind, B:Deaf, C:Mentally disabled, C1:Moderate Mental Retardation, D: Punishment, F: Female, M: Male

Then to be continued with processing corn skins to become standard material for making learning media. After finding the formula, various methods for processing corn skins were explored. Then continued withth the stage improvisation. The following shows the corn husk processing process in Figure 2.

Sorting Process **Bleaching Process** **Coloring Process**

Figure 2. Corn Husk Processing Process

Stage 2: Improvisation

After the idea has been determined based on several considerations, several decorative designs are made. Then experiments were carried out on the application of materials to other design forms and supporting structures. Source design is then realized in creating learning media products for art and culture. Figure 3 presents the decorated design below.

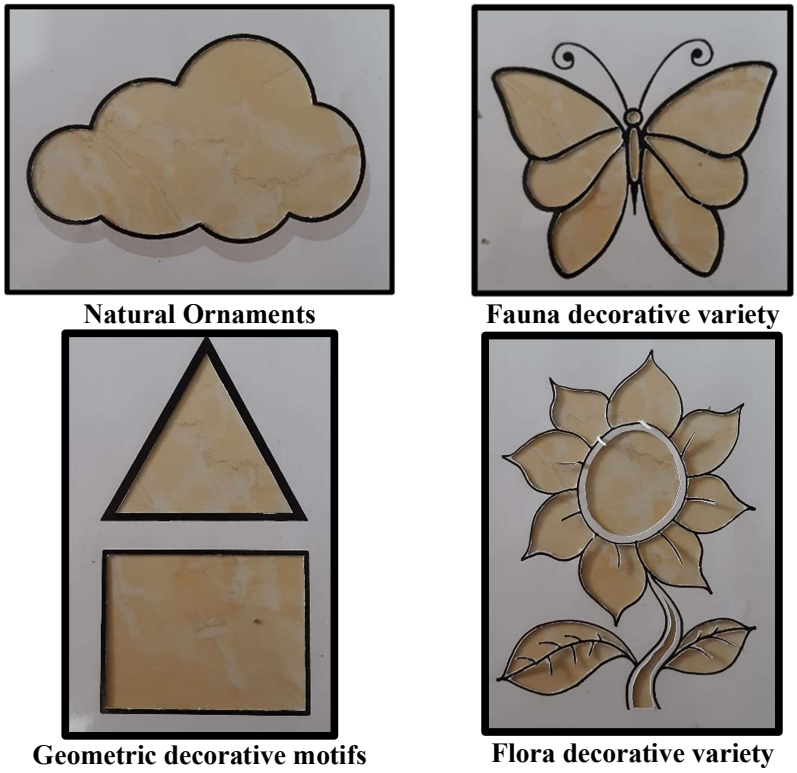


Figure 3. Decorated Design

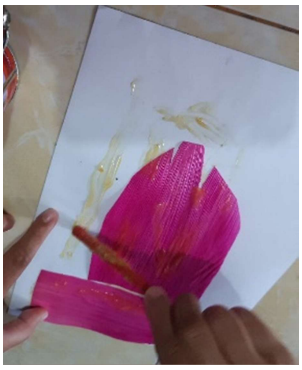
Stage 3: Forming

The design transforms into a product prototype, yielding several tool props suitable for use as learning media. The targeted results of this study are new findings in the form of a formulation of a trial concept for making and using corn husks as a learning medium that can be used as an aid in the teaching and learning process in the subject of art and culture, visual arts materials, and decorative motifs for blind students at Extraordinary School Gorontalo City. Below are presented the stages of making arts and culture learning media, visual arts materials, and the topic of decorative varieties from corn husks in Figure 4.

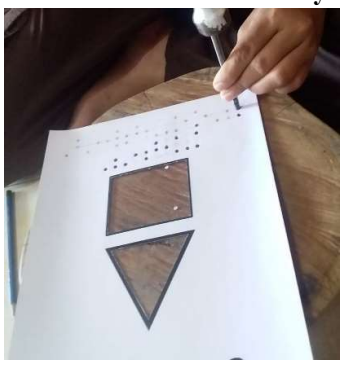
Slicing Process Natural Ornaments

Slicing Results Flora Ornamental Variety

Measurement Process Skin Corn



Bonding Process Skin Corn

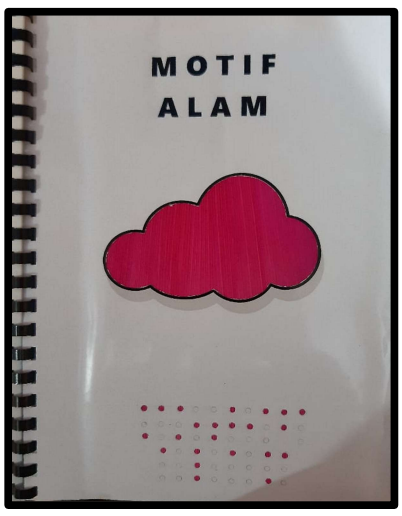


Making process Braille Letters According to Decorative Motif Types

Finishing Process

Figure 4. Stages of Making Arts and Culture Learning Media, Visual Arts Materials, and the Topic of Decorative Varieties from Corn Husks

More clarity about the form of the results of making the learning media can be seen in the photos shown below in Figure 5.



Instructional Media Natural Ornaments

Instructional Media Fauna Ornamental Variety

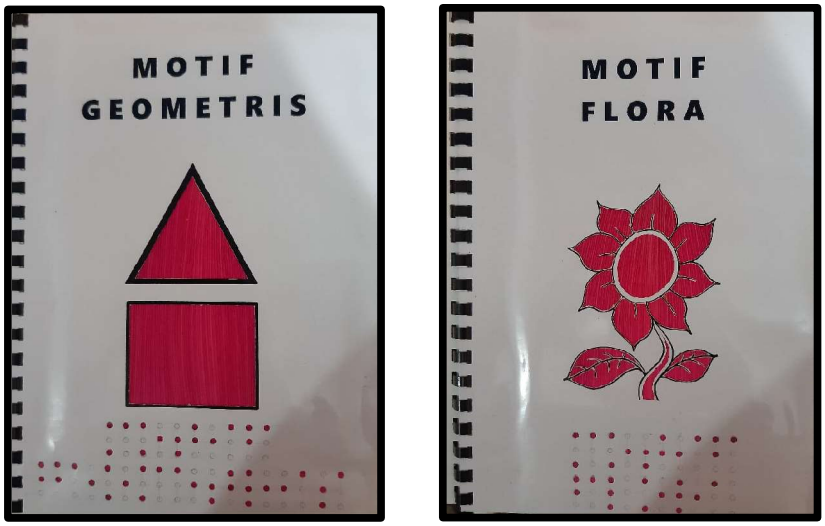


Figure 5. Arts and Culture Learning Media, Visual Arts Materials

Discussion

To address the results of this study, researchers focused on developing educational media, particularly in the exploration phase, which involved reviewing existing research, analyzing visual data, and conducting interviews. They discovered that processing corn husks takes about six hours and works better with older corn husks, making the fibers clearer when touched. This stage successfully identified different sources of inspiration for creating decorative designs, including a) floral patterns; b) animal patterns, like butterflies; c) geometric patterns, such as triangles and quadrilaterals; and d) natural patterns, like clouds. The findings from exploring these decorative patterns were then moved on to the design stage of learning media.

The forming stage involves creating a design (sketch), selecting the optimal sketch, printing decorative motifs, generating Braille codes, and putting the decorative motif designs on the primary material, along with the incorporation of corn husks. The design of this educational media came from observing real-life examples, showing that art and culture teachers need to use materials that help students with disabilities at the Extraordinary School in Gorontalo. Consequently, this research appears to remain viable for progression to the field implementation phase.

In making learning media, what must be considered is that the basic point in making this media is to provide convenience for students, and the media is adjusted to the characteristics of the learning participants (Ediyani et al., 2020; Sudarsana et al., 2020; Bringman-Rodenbarger & Hortsch, 2020). It's supported by the opinion of Billingsley et al. (2018), who said that to achieve the expected learning outcomes, each of the Extraordinary school student's disorders requires different learning methods.

After going through various stages in a process, including preparing the main raw materials in the form of corn husks, preparing supporting equipment, the process of

making decorative designs, and the work process to finishing, the learning media for extraordinary school students, especially the blind, was created to facilitate the delivery of material on art and culture subjects, the main topics of visual arts and decorative design.

4. CONCLUSION

Building upon the findings of this study, researchers concluded that learning media can be created in the following ways: The exploration stage carried out, both through searching for literature data, visual data, and information from interviews, showed that processing corn husks takes a relatively short time, so it can be completed in approximately six hours using old corn husks so that the corn husk fibers are clearer when touched. This stage successfully identified and found several sources of ideas for the concept of creating decorative designs, namely: a) exploration of decorative motifs of flora (flowers), b) exploration of decorative motifs of fauna (butterflies), c) exploration of decorative motifs of geometric shapes (triangles and quadrilaterals), and d) exploration of decorative motifs of nature (clouds). We then proceeded to design learning media based on the results of the decorative motif exploration.

The forming stage is carried out by making a design (sketch), determining the best sketch, printing decorative motifs, making Braille codes, applying decorative motif designs to the main material, and applying corn husks. The visualization of this learning media originated from the recognition of existing phenomena, highlighting the need for art and culture teachers to have media that accommodates the disabilities of students at Extraordinary School Gorontalo. Upon careful consideration, it appears that this research remains viable for advancement to the field implementation stage.

To ensure that the results of this study truly benefit the community and support the optimization of learning outcomes in arts and culture subjects at Extraordinary School, the relevant parties should provide a special space for testing this media. In order to provide convenience for teachers to achieve their learning goals.

REFERENCES

Alkasasbeh, A. A., & Ghinea, G. (2020). Using olfactory media cues in e-learning–perspectives from an empirical investigation. *Multimedia Tools and Applications*, *79*, 19265-19287. https://doi.org/10.1007/s11042-020-08763-3

Alwi, S. H., Hasdiana, H., & Mohamad, I. (2024). Pengembangan Media Pembelajaran Berbasis Scrapbook Pada Materi Seni Kaligrafi Bagi Siswa Kelas XI SMA Negeri 1 Gorontalo. *Innovative: Journal Of Social Science Research*, *4*(6), 9102-9116. https://doi.org/10.31004/innovative.v4i6.17178

Anderson, A., & Valero, L. (2020). Supporting academic vocabulary and social-emotional skills of students with learning disabilities through an arts-integrated social studies approach. *Teaching Exceptional Children*, *53*(2), 150-162. https://doi.org/10.1177/0040059920942266

Artiola, J. F. (2019). Industrial waste and municipal solid waste treatment and disposal. In *Environmental and pollution science* (pp. 377-391). Academic Press. https://doi.org/10.1016/B978-0-12-814719-1.00021-5

Billingsley, G. M., Thomas, C. N., & Webber, J. A. (2018). Effects of student choice of instructional method on the learning outcomes of students with comorbid learning and emotional/behavioral disabilities. *Learning Disability Quarterly*, *41*(4), 213-226. https://doi.org/10.1177/0731948718768512

Bringman-Rodenbarger, L., & Hortsch, M. (2020). How students choose E-learning resources: The importance of ease, familiarity, and convenience. *Faseb Bioadvances*, *2*(5), 286-295. https://doi.org/10.1096/fba.2019-00094

Budiarti, A., Muckromin, A., Budiwati, R., & Minsih, M. (2023). Management of children special needs with emotional and behavioral disorders through education services. *At-Tajdid: Jurnal Ilmu Tarbiyah*, *12*(1), 12-19. https://ejournal.isimupacitan.ac.id/index.php/tajdid/article/view/308

Dell'Anna, S., Pellegrini, M., & Ianes, D. (2019). Experiences and learning outcomes of students without special educational needs in inclusive settings: a systematic review. *International Journal of Inclusive Education*, *25*(8), 944–959. https://doi.org/10.1080/13603116.2019.1592248

Di Fuccio, R., Ponticorvo, M., Nadim, M. A., & Limone, P. (2024). Exploring the effect of digital and multisensory educational materials on retention in primary school using Tangible User Interfaces. *Interactive Learning Environments*, *33*(4), 2928–2938. https://doi.org/10.1080/10494820.2024.2427277

Duran, D. (2016). Learning-by-teaching. Evidence and implications as a pedagogical mechanism. *Innovations in Education and Teaching International*, *54*(5), 476–484. https://doi.org/10.1080/14703297.2016.1156011

Ediyani, M., Hayati, U., Salwa, S., Samsul, S., Nursiah, N., & Fauzi, M. B. (2020). Study on development of learning media. *Budapest International Research and Critics Institute (BIRCI-Journal): Humanities and Social Sciences*, *3*(2), 1336-1342.

Gierczyk, M., & Hornby, G. (2021). Twice-exceptional students: Review of implications for special and inclusive education. *Education Sciences*, *11*(2), 85. https://doi.org/10.3390/educsci11020085

Hasdiana, H., & Ayuddin, A. (2017). Quality improvement of corn husk as raw material for textile products. In *1st International Conference on Social, Applied Science and Technology in Home Economics (ICONHOMECS 2017)* (pp. 141-145). Atlantis Press. https://doi.org/10.2991/iconhomecs-17.2018.34

Hawkins, H. (2015). Creative geographic methods: knowing, representing, intervening. On composing place and page. *cultural geographies*, *22*(2), 247-268. https://doi.org/10.1177/1474474015569995

Lemons, C. J., Vaughn, S., Wexler, J., Kearns, D. M., & Sinclair, A. C. (2018). Envisioning an improved continuum of special education services for students with learning disabilities: Considering intervention intensity. *Learning Disabilities Research & Practice*, *33*(3), 131-143. https://doi.org/10.1111/ldrp.12173

Lenvik, A., Jones, L. Ø., & Hesjedal, E. (2022). Teachers' perspective on gifted students with extraordinary learning potential in Norway: A descriptive study with primary and secondary teachers. *Gifted and Talented International*, *37*(2), 163–172. https://doi.org/10.1080/15332276.2022.2138796

Moto, M. M. (2019). Pengaruh penggunaan media pembelajaran dalam dunia pendidikan. *Indonesian journal of primary education*, *3*(1), 20-28. https://doi.org/10.17509/ijpe.v3i1.16060

Nurwidyayanti, N. (2022). Karakteristik dan permasalahan untuk anak berkebutuhan khusus. *Klasikal: journal of education, language teaching and science*, *4*(3), 662-669. https://doi.org/10.52208/klasikal.v4i3.460

Rene, E. R., Sethurajan, M., Ponnusamy, V. K., Kumar, G., Dung, T. N. B., Brindhadevi, K., & Pugazhendhi, A. (2021). Electronic waste generation, recycling and resource recovery: Technological perspectives and trends. *Journal of hazardous materials*, *416*, 125664. https://doi.org/10.1016/j.jhazmat.2021.125664

Siahaan, M. K. (2022). Education for children with special needs. *The Explora*, *8*(2), 14-27. https://doi.org/10.51622/explora.v8i2.642

Simorangkir, M. R. R., & Lumbantoruan, J. H. (2021). Aksesibilitas Anak Berkebutuhan Khusus di Era Pendidikan 4.0. *Jurnal Dinamika Pendidikan*, *14*(1), 204-213. https://doi.org/10.51212/jdp.v14i1.2901

Sudarsana, I. K., Arini, N. W., Mastini, G. N., Sukerni, N. M., & Pusparini, L. D. (2020). *Learning media: The development and its utilization*. Yayasan Ahmar Cendekia Indonesia.

Widana, I. W., Sumandya, I. W., & Citrawan, I. W. (2023). The special education teachers' ability to develop an integrated learning evaluation of Pancasila student profiles based on local wisdom for special needs students in Indonesia. *Kasetsart Journal of Social Sciences*, *44*(2), 527-536. https://so04.tci-thaijo.org/index.php/kjss/article/view/266283

Zigmond, N. P., & Kloo, A. (2017). General and special education are (and should be) different. In *Handbook of special education* (pp. 249-261). Routledge. https://doi.org/10.4324/9781315517698-21