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The use of technology in hybrid learning for student with special needs

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Article Info

ABSTRACT

This study aims to describe the use of technology in learning for students with special needs during the transition period after the COVID-19 pandemic to the new normal. This study is descriptive research with a survey method. The survey was conducted with 41 special education teachers with variety of special needs students. Data is collected using Google Form questionnaires. Data analysis is carried out by calculating the frequency and is presented as percentages. Participants in this study were chosen randomly for data variation. The presentation of data is carried out qualitatively based on the respondents' answers to the questions asked. The study participants argued that hybrid learning was feasible, even though it was recognized as encountering obstacles. Based on the results of a survey conducted by special education teachers at special education school (SLB), for hybrid learning, digital platforms are used to support online learning. The platforms used are WhatsApp and video conferencing, such as Google Meet. Integrating technology is considered important for teachers to support the learning process. Conscious and planned efforts and teacher motivation are critical to increasing their experience and skills in utilizing technology in learning.

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1. INTRODUCTION

The advancement of information and communication technology greatly influences the world of education, especially in supporting the learning process. The use of technology to support learning has become synonymous with 21st-learning. Technology development gives rise to various learning models that are more varied and innovative. Teachers have been pushed even more to adapt to changes in this age of globalization by using different apps from different digital learning platforms.

The development of science and technology led to a significant shift toward the practical era. The development of information technology in the education sector has penetrated management and learning in the classroom [1]. The use of technology in learning is an effort to answer the challenges in implementing learning tasks to achieve learning goals. In line with the development of technology that is currently used, many countries have begun to use technology as a learning medium to improve learning to make it more effective [2].

The use of this technology is in line with the development of society 5.0, an era where technology is part of the human being itself. The essence of technological progress and development in the era of society 5.0 is how technological developments can minimize gaps in humans [3]. In accordance with 21st-century

learning, one related to the use of technology, its implementation in learning should be able to usher in an understanding of information, media, and technology skills.

The role of technology in education includes making it easier for students and teachers to engage in the learning process [4]. Furthermore, the role of other technologies revealed by technological advances in the learning process can allow teachers and students to not meet in person but instead use the internet and other technologies. Digital technology has begun to be used in educational institutions as advice to support learning both as an information tool to access information and as a learning tool, namely as a means of supporting learning activities and assignments [5].

The use of technology can be used for children with special needs, especially as a learning medium [6]. The use of technology for children with special needs is one way to reduce limitations in their learning. The limitations in learning whose impact have been felt in almost all corners of the world were evident during the emergence of the COVID-19 pandemic outbreak. One of the limited interactions between teachers and students is a problem experienced by most teachers during a pandemic [7].

The COVID-19 pandemic ushered in a major change in the implementation of education. Pandemic conditions at that time required the full implementation of learning to be carried out hybrid or online. Online learning may be effective despite other obstacles [8]. The obstacles include the readiness of learning devices in hybrid learning to the readiness of students and parents to carry out full hybrid learning.

Along with the ongoing pandemic journey, educational institutions, teachers, and students continue to adjust to the challenges of the learning process [9]. Limited conditions due to the implementation of social distancing due to the pandemic gave rise to the application of a blended learning approach online or synchronously and through limited face-to-face [10]. The condition of the COVID-19 pandemic has gradually slowed down and ushered in regulations regarding implementing limited face-to-face learning (PTMT). The circular letter of the Minister of Education and Culture No. 3 of 2022 provides options for participating in limited face-to-face or distance learning. Hybrid learning is an alternative that can be chosen to carry out the learning process while still implementing health protocols [11].

The hybrid learning model is a learning model designed by combining face-to-face learning with the use of computer and internet technology [12]. The use of the internet is intended as a support for the learning process that provides new learning options and experiences to access various learning resources [13]. Furthermore, it allows learning to happen anywhere and anytime and encourages students to learn actively. In line with on hybrid learning, it is seen as an ideal learning method in the new normal era after the COVID-19 pandemic, which presents the option of combining traditional classes with the use of digital devices to support learning [14]. Hybrid learning is considered an effective learning model for distance-limited learning that combines synchronous interaction with online learning delivery [15].

The formulation and implementation of the learning process in special education units are still being pursued in line with the COVID-19 pandemic. The combined learning model between virtual and limited face-to-face in the new normal transition period is still running by adhering to strict health protocols. The hybrid model formulation is implemented to transition to the new normal era by combining face-to-face and virtual learning [16].

Various challenges in implementing learning in the new normal transition period in special education units are still widely encountered. During an emergency in the new normal transition era, several challenges were found in learning, such as learning media that was not optimal, limited internet access, low learning motivation, and irregularities in the learning process [17]. One of the challenges encountered based on observations and survey results is the lack of readiness of teachers to prepare learning media that supports the implementation of hybrid learning. The lack of variety in the selection of learning media known by teachers is suspected because they are unfamiliar with the various existing technology platforms.

Based on previous studies, hybrid learning found various challenges, such as educator readiness, learning support facilities, and so on, both for educators and students [18]. It is in line with the findings in the field related to the implementation of learning during the transition period of the COVID-19 pandemic, which come from the readiness of parents of students with special needs for electronic devices that will be used in hybrid learning. The readiness of teachers in the use of technology is also an important thing to consider in maximizing hybrid learning [19]. The role of the teacher becomes important that in the conventional learning process to hybrid learning. This must be considered as an effort to ensure that the learning process runs effectively and in pleasant conditions, even in limited conditions. Learning challenges in the new normal era require modifications to the learning process, so resilient teachers are needed in this new normal era [20], [21].

Teacher experience in learning various digital platforms is a supporting factor for the optimal use of technology in learning. Teachers must be able to master media and applications that support teaching and learning activities [22]. Challenges show that teachers are not ready to hold current learning related to technology [23], [24]. This is reinforced by the fact that in the field which shows the variety of technology

used for teaching is still limited. Teachers recognize the difficulty of adapting to existing technological developments. The reason teachers are constrained by adapting to technology is related to age, busyness, and other things [23]. Efforts made by teachers in addition to continuing to adapt can be made by taking time to take part in existing training [25], [26]. The psychological readiness of educators to implement hybrid learning (online and offline) is determined by attitudes, knowledge, and ability to integrate learning content into technological devices [19]. This readiness will affect how teachers adapt to existing technological developments so that they will feel easy in helping to deliver material in the learning process.

This study focuses on the use of technology used by teachers in accommodating learning with this hybrid model. This study focuses on answering research questions related to technology-based media, such as what is used by teachers in supporting hybrid learning. This study also focuses on the understanding and experience of teachers, and teacher perceptions of the use of technology that supports hybrid learning. This study also knows the role of technology in supporting hybrid learning for students with special needs.

2.   RESEARCH METHOD

This study used descriptive research with a survey method. The aspects developed in the questions on the list of questions in the survey are divided into several parts. The first part of the list of questions in the survey asks about the demographic aspects. The distribution of teaching levels and the specificity of teacher respondents in special education schools in this study varies. Teaching levels vary from pre-primary, primary, junior high, to senior high schools. The special needs of students who are taught vary from visual impairment, hearing impairment, mental impairment, deafness, autism, and slow learning.

Furthermore, the second part of the list of questions contains the categories of technology used by teachers in supporting hybrid learning. Then, the third part contains a list of questions that gather information about understanding and perceptions about the use of technology to support hybrid learning. Before carrying out data collection, first collect information about the number of special education schools in Balikpapan that carry out hybrid learning in the post-pandemic period, one public school and one private school. The respondents in the study were special education teachers who taught in special education school in Balikpapan City, Indonesia. Teachers range in age from 31 to 40 years old, with the youngest being 21 to 30. Most teachers teach at the primary school level with a student age range of 7-12 years old. Most respondents were between the ages of 31 and 40 and were most dominant in teaching primary school students with intellectual disability. The respondents to this study were 41 special education school teachers who filled out a survey in Google Form. The data collection procedure was disseminated by snowball by sending a Google Form survey to WhatsApp groups of special education school (SLB) teachers in Balikpapan City.

Data collection in this study was carried out by providing questionnaires online using Google Form. The questionnaire validated with expert jugdement and consulted to expert practicioners who are special education teachers. Data analysis was carried out descriptively by calculating the frequency of the statements chosen by the respondents. The obtained value is converted into a percentage to describe the proportion of each statement selected and disclosed by the respondent.

3.   RESULTS AND DISCUSSION

Through the survey results, data was collected about the technology platform used to support hybrid learning. The data collected from special education teachers with variety of special needs students. Most of reponden are teacher for student with intellectual disability. The results are outlined in Table 1.

Table 1. Technology platforms in hybrid learning

Variable	Group	n	Percentage
Utilization of technology/media used to support hybrid learning*	WhatsApp group	35	85.4
	Video conference/web meeting	20	48.8
	Student worksheets (LKPD) online	17	41.5
	Video online/offline	13	31.7
	Google Classroom	7	17.1
	Make use of the learning portal	5	12.2

*Respondents chose more than 1 answer

From the data obtained based on the survey results, and in line with the experience of special education teachers in utilizing technology, most choose the use of WhatsApp as a medium to support hybrid learning. In supporting the implementation of the learning process, the WhatsApp group is one of the applications that is familiar and widely used as a communication tool, including in the educational

environment where this is in line with opinions [27], [28]. Other technologies that special education teachers have used in supporting the learning process with a hybrid model include using other digital platforms such as video conferencing to provide online and offline videos and using Google Classroom.

In line with the study which found the digital platforms that are most often used to support learning, especially when in the network (hybrid), namely WhatsApp groups, video conferences, and the use of Google facilities such as Google Classroom [29]–[31]. One of the reasons for choosing the use of WhatsApp, video conference, and Google Classroom is because it utilizes the technology that has been provided and is quite familiar [32]–[34]. The use of WhatsApp group, video conference, and Google Classroom is an option other than because the features that are indeed free also tend to be familiar to use because previously teachers have received training, especially in utilizing Google features. The use of a learning management system is not an option because most teachers are not familiar with it and do not have experience developing it to support learning in special education school.

The data showed the understanding and experience of teachers in special education in managing learning with the use of technology, especially with a hybrid learning model. Based on Table 2, during the implementation of hybrid or hybrid learning between hybrid and face-to-face learning. There are several inhibiting and supporting factors in implementing hybrid learning [35]. The application of learning with a hybrid model requires much reassessment.

Table 2. Teachers' understanding and experience, especially in the use of technology to support hybrid learning

Variables	Group	n	Percent
Hybrid learning implementation	It has been done	13	31.7
	Simply done	27	65.9
	Not yet done	2	3.7
Interaction between teachers and students with special needs in the use of technology for hybrid learning	Less	4	9.8
	Enough	18	43.9
	Good	18	43.9
	Excellent	3	7.3
The importance of teachers being able to understand technological developments and integrate them in learning	Yes	41	100
	Not	0	0
Efforts made to improve understanding and skills in the use of technology in learning	Self-study	29	70.7
	Join a webinar	26	63.4
	Ask colleagues	32	78

This survey showed obstacles to implementing hybrid learning, especially in online learning. The obstacles encountered are related to the limitations of students with special needs in accessing learning technology platforms, the use of technology, and the readiness of teachers to use digital platforms for learning. It needs to be considered because the use of technology as a learning medium will be interrelated and influence the implementation of learning [36], [37].

One of the obstacles to using technology from a teacher's perspective in hybrid learning is the readiness of teachers to adapt to technology. The era of education in the industrial revolution 4.0 towards society 5.0, characterized using digital technology in the learning process, requires teachers to adapt. The obstacles teachers encounter, especially in developing teaching creativity, are not due to limited facilities but the competitive power of teachers that needs to be grown [23]. Teacher competence is the main key to successful learning, especially related to the use of technology in this COVID-19 transition period [38], [39]. Teachers must continue to learn and innovate to adjust knowledge and abilities in the industrial era 4.0 [40]. Furthermore, to improve understanding and skills in the use of learning technology, most teachers stated that asking colleagues is an effort made to upgrade their understanding and skills in the use of technology. The presence of technology colors the challenges in the application of learning with a hybrid model. To maximize the hybrid learning model, teachers should be able to harmonize face-to-face and online learning sessions by maximizing the use of technology in learning [15].

There are several factors that support and inhibit teachers from innovating and developing teaching creativity by utilizing technology [23]. From students' perspective, there are still challenges in using a special technology for students with a lower middle economy who do not have devices and the availability of inadequate internet networks [38], [39]. One of the challenges of hybrid learning is seen from network factors, students themselves to teacher understanding in this hybrid learning technique. Learning in the new normal era in the learning process is also inseparable from parental support, namely the availability of adequate communication tools for learning [20].

Table 3 unravels several things that need to be considered in using technology for students with special needs according to the perception of special education teachers. The survey showed that infrastructure, students with special needs, and teachers' abilities are interrelated in using technology. Regarding infrastructure related to the use of technology, some things must be considered to support learning according to the teacher's perception. It includes the availability of networks and supporting facilities and the use of technology that is easy to use and adaptive for students with special needs. The readiness related to infrastructure, especially related to technology, support digital-based learning, which needs to be prepared, especially in hybrid learning [16].

Table 3. Teachers' perceptions of the use of technology for learning for students with special needs

Reviewed from the facilities	Reviewed from students' abilities	Judging from the teacher's ability
1. It will be carried out if the internet network is adequate	7. Media decisions must be adapted to student's abilities and needs.	11. Need collaboration and cooperation with parents
2. Utilizing technology such as video conferencing applications and other digital platforms	8. The technology used should be accessible to students with special needs	12. Teachers should learn about technology and information technology or IT utilization
3. The chosen technology should be easy to use	9. Adapted to the learning characteristics of students with special needs	13. Teachers must adapt to current conditions and situations
4. The chosen technology should integrate visual and audio elements	10. Students should be familiarized with the use of technology that facilitates learning	14. Teachers can sort out the use of technology to create effective online learning
5. The use of technology must be varied and interactive		15. Teachers must be able to be creative in developing and creating media
6. Technologies that support learning should be adaptive for children		16. Teachers must take the initiative to improve IT understanding, one of which is through training

Then on the perception of teachers regarding the use of technology that supports hybrid learning, they must also consider matters related to student abilities. The selected technology should be tailored to the needs and align with the student's abilities. Because technology is presented to facilitate the learning process, the use of technology should be able to consider accessibility or ease for students to access learning. The principle of technology selection in learning should also consider the student's characteristics. Then it becomes important to equip the knowledge and experience of the student in utilizing the technology because this is part of the student's knowledge of the developing technology.

Furthermore, in terms of teacher perception and teacher ability, several recommendations were obtained related to the efforts teachers must make in using technology to support hybrid learning. Hybrid learning that combines face-to-face and online learning requires collaboration between teachers and parents. It is done to ensure that the learning process that occurs at home with a hybrid can be carried out. Teachers must be able to adapt to any situation related to implementing learning for students in any mode. Then it is important to teach students how to use technology and give them practice because it is significant for students to get used to new technology.

Moreover, the survey results stated that special education teachers, represented by 41 special education teachers' respondents, agreed that teachers should always upgrade their understanding and experience related to technology and information. Teacher competencies related to the use of technology must always be developed as a form of adaptation to the development of the current digital world. The Regulation of the Minister of National Education Number 16 of 2007 [41] stated that information and communications technology or ICT competencies for teachers have at least two functions, they are: i) Self-development; and ii) Supporting the learning process. The determination of this competence is a logical consequence considering the large influence of ICT in the learning process and line with the rapid development of the digital world.

The use of technology in learning is an effort to improve the quality of learning. The use of technology in supporting learning must be in line with the ability of teachers to take an active role in the learning process according to the needs of students. Technology can be used as a support for learning and learning materials so that it is in line with the desired learning objectives. The role of technology is important in facilitating educators in delivering learning materials so that learning continues even though it is not carried out face-to-face [42].

All the above related to the use of technology in hybrid learning for students with special needs certainly also need support and readiness. Managing a hybrid learning model requires careful readiness of all components involved [43]. The most important readiness is related to the curriculum in managing hybrid learning models. In addition, participation in hybrid learning is dependent on the readiness of infrastructure, teachers, and school staff to manage hybrid learning models, and finally, students are invited to participate.

From the COVID-19 pandemic to the post-pandemic, digital technology is still considered a solution to the continuity of education. Technology provides facilities that make education more meaningful amid existing limitations [44]. Learning that is carried out online ushers in freedom for teachers to develop innovations both in teaching methods and in the development of learning media using various existing platforms to support learning. According to the findings of this study, in addition to using WhatsApp group to communicate with students or parents or guardians of students, teachers have also become proficient in using various web meeting applications to conduct teleconferences, utilize gadgets, access existing digital platforms, develop learning materials online, and even go so far as to design asynchronous learning using Google Classroom. Hybrid digital learning with the help of digital applications [45].

Readiness in infrastructure can be encouraged through increasing school readiness in fulfilling learning support infrastructure led by the principal as a team leader. The principal drives the readiness of both infrastructures, educators, and education staff and students' readiness to be ready for hybrid learning by ensuring curriculum readiness. Educators and education staff are formulated to be creative and innovative in developing learning by integrating technology to make it more mature when carrying out hybrid learning. Students are also starting to be introduced to technology, which in the case of special education schools, requires involvement with parents to support learning based on information and communication technology to minimize obstacles in hybrid learning.

In line with post-pandemic conditions, the learning process continues while maintaining strict health protocol standards. Learning with a hybrid model as an alternative to learning that combines hybrid and face-to-face learning certainly requires appropriate technology to ensure sustainability. Teachers have a perception of the use of technology using their understanding and experience so that they can know, understand and be aware of the condition. Therefore, from the perception or interpretation process comes a response, confidence, and hope from using technology to support learning for students with special needs.

The development of technology in education ushers in the understanding that technology supports learning and continues to develop along with the rapid development of technology. Technological developments are related to developing sophisticated things, one of which is in the world of education, namely cyber teaching, or virtual learning [46]. Virtual learning, of course, cannot be separated from internet use. The development of sharing digital platforms that can support and facilitates learning and teaching. It takes creativity and innovation from teachers to take advantage of the potential, especially in the use of technology, so that learning can take place, especially in hybrid learning.

The role of technology in supporting hybrid learning for students with special needs helps teacher to in ensuring learning process. On the other hand, it helps implement learning activities during a pandemic but is also considered less effective [14]. In hybrid learning, technology is used by special education teachers to be able to carry out virtual learning and provide assignments and coordinate with parents, especially to accompany the learning process as long as they do not carry out offline learning. Some of the digital technology platforms chosen by most special education teachers are digital platforms which are actually quite familiar to use, easy to adjust to parents' willingness. The choice of using this technology is also adapted to the various characteristics of students with special needs so that the simplest one is chosen and can be used adaptively according to the abilities of students.

The use of Whatsapp groups, Google Meet and also Google Classrom as the technology used in this hybrid learning is based on the results of a readiness assessment that was previously carried out by each teacher on students, parents, infrastructure and also the teacher. The use of this technology is used to ensure that hybrid learning that is carried out during the post-pandemic transition period can be carried out for students with special needs. The main thing in using this technology is that it must be adjusted according to assessments related to readiness both in terms of teachers, students, parents and supporting infrastructure.

4. CONCLUSION

The use of technology and media is effective in supporting hybrid learning. The implementation of hybrid learning requires a learning delivery tool to help students understand the learning material. Teachers use a variety of digital platforms such as WhatsApp, Google Classroom, video conference, and other applications. According to the teacher's view, it is important, especially for a teacher to understand the development of existing technology, especially for a teacher. The use of technology is considered to provide benefits not only to help students understand the material but also to try to build interaction between teachers and students in learning. The combination of face-to-face learning and learning to facilitate students learning certainly cannot be separated from using technology in learning.

Based on the analysis, teachers see that three important things need to be considered in using technology, especially to support learning for students with special needs. Regarding infrastructure, the selection of technology for learning should be able to choose technology that is simple and easy to use and

adaptive technology for students with special needs. Furthermore, judging from the condition of students, the selection of technology as a learning aid should be accessible and adapted to the learning abilities and characteristics of students with special needs.

Then, in line with the teacher's perception of using technology for learning, the special education teachers agreed that it is important to upgrade knowledge and skills related to this. Teachers realize the importance of adapting to fast-moving technological developments to be applied in the learning process so that they can choose and sort out technologies that can be used to teach students with special needs. Teachers have tried to improve understanding and skills in using technology in learning, such as asking peers, self-studying, and attending existing training or webinars. Therefore, from the efforts teachers have made, teachers can design effective learning by developing creative learning media using existing technology.

This study implies that the use of technology can help special education teacher in the implementation of hybrid learning in the post-pandemic transition period in special education school. The limitation of this study is that there is no validation related to measuring instruments used to dig up data. For further research, various assessments can be carried out so that this research can continue to explore information related to the use of technology to support learning for students with special needs. Further research needs to be carried out to validate the instruments used, and reliability calculations need to be carried out in this study.

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