

## **DISTANCE LEARNING WITH THE THINK TALK WRITE STRATEGY TO INCREASE KNOWLEDGE OF COVID-19 STUDENTS WITH HEARING IMPAIRMENTS**

BUDI SUSETYO\*, EUIS HERYATI,  
DINI DWI APRIANI, WAHID MUNAWAR, WIWI SISWANINGSIH

Universitas Pendidikan Indonesia, Jl Setiabudhi No. 229, Bandung Indonesia

\*Corresponding Author: budisusetyo@upi.edu

### **Abstract**

This study aims to increase the knowledge of students with hearing impairments about COVID-19 which makes the change from face-to-face learning to distance learning. The research uses an experimental method by trying the think-talk-write strategy, in distance learning, especially learning Natural Sciences (IPA). The research sample of 24 hearing impaired student in special school for the hearing impaired in West Java, Central Java, East Java, and Bali. The data analysis technique uses a sign test, the mark used is the minimum completeness criteria (KKM) of 60% or a score of 30 from the highest score of 50. The results of research using the think-talk-write strategy in distance learning achieved a score of 30, in general, they just reached a score of 28. Students with hearing impairments have difficulty receiving verbal instructions in distance learning with think talk write strategy because they cannot be reached physically, so students do not fully understand the teacher's explanation. Various forms of multiple-choice tests and online exams cause knowledge to be low due to unfamiliarity. Research on the think talk write strategy can be a reference in distance learning services in other subjects for hearing impaired students. In addition, a variety of multiple-choice test instruments can be used to improve the quality of assessment in various learning materials..

Keywords: COVID-19, Students with hearing impairments, Think talk write strategy.

## **1. Introduction**

Knowledge of the coronavirus disease (COVID-19) is necessary for students with hearing impairments who experience obstacles in their hearing [1]. Dissemination of information related to COVID-19 can occur in the form of writing, simple images, and easily understood by the wider community, including for hearing impaired students [2]. There are still many students with hearing impairments in special schools [3]. They do not understand COVID-19, it needs to be taught [4] in a special school science class for hearing impaired students. Thus students with hearing impairments know what COVID-19 is, how to transmit it, and prevention for the safety of themselves and their families [5].

Many factors cause students with hearing impairments to not fully understand information related to COVID-19, even though the government or the authorities have informed the public [6]. The main factor as a cause is the impact of deafness which hinders the receipt of information [7] from outside and another factor is the use of learning media that is limited and rarely used when learning takes place in class [8].

Hearing limitations in students with hearing impairments result in limited vocabulary [9] and mastery of information about COVID-19 is also limited so that students with hearing impairments often cannot understand what is conveyed by other parties [10]. Appropriate learning strategies are needed for distance learning to facilitate the mastery of knowledge for students with hearing impairments [6]. This think talk write strategy is a learning strategy that consists of three stages, namely: think, talk, and compose sentences (write) can be used for learning students with hearing impairments.

Many studies use think talk write strategies in the classroom (not online) on mathematics communication materials [11], mathematics learning outcomes [12] exposition text writing skills, descriptive writing skills [13], writing skills [14], writing descriptive text [15].

Digestive system [16], use think talk write strategy in online learning has been implemented on language literacy materials [17], physical education for children with hearing impairments [18], and has been implemented in Inclusive Elementary Schools [1]. However, until now there has been no research that discusses COVID-19 material using the think talk write strategy in distance learning for students with hearing impairments.

This study used an experimental method with a think talk write strategy, in distance learning the subject matter of COVID-19. Learning is carried out using various media tools, [19] especially picture media so that students with hearing impairments can easily accept knowledge through their sight, as a substitute for hearing. To measure the ability of students with hearing impairments [6] an online and centralized test is conducted. The achievement of abilities obtained by students with hearing impairments in distance learning is below the minimum completeness criteria of 30, namely 28. Novelty of this study were the think talk write strategy equipped with visible learning media can be used as a reference in the form of distance learning services for hearing impaired students. In addition, the variety of computer-based multiple-choice test instruments can be used as a means of improving the quality of assessment in distance learning.

## 2. Logical Framework Review

### 2.1. Classification and structure of COVID-19

Coronavirus infection (COVID-19) is an infectious caused by the SARS-CoV-2 virus that infects the respiratory tract. The coronavirus research group of the International Commission for Viral Classification has classified coronaviruses as members of the *Coronaviridae*. The *Coronaviridae* are divided into four genera, *Alphacoronavirus*, *Betacoronavirus*, *Gammacoronavirus*, and *Deltacoronavirus* (Fig. 1A), according to their genetic and serologic characteristics. Coronavirus is an unsegmented enveloped viruses with a single-stranded RNA (ssRNA) 26-32 kb in length [20]. At this length, the genome of coronavirus is the largest of the RNA viruses. SARS-CoV-2 particles showed a spherical shape with a diameter of 60 to 140 nm (Fig. 1B). SARS-CoV-2 is a transmembrane glycoprotein composed of the S1 region containing NTD and CTD, the transmembrane S2 region, and a short cytoplasmic domain [21] (Fig. 1C).

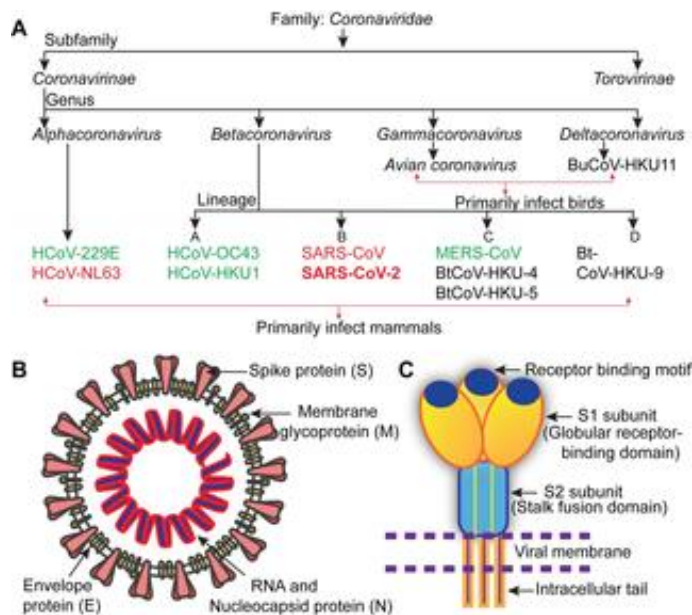


Fig. 1. Classification and structure of coronavirus [20].

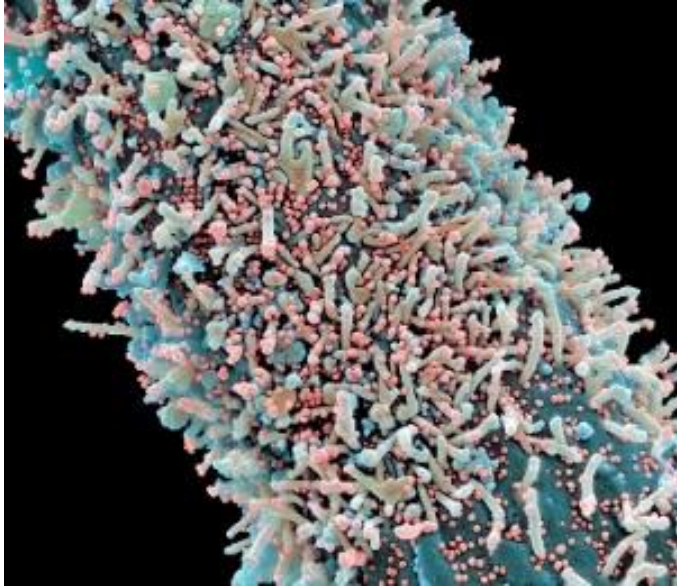
### 2.2. Transmission of COVID-19

SARS-CoV-2 can be transmitted directly (droplets and person-to-person) and indirectly [21]. There are three ways to spread COVID-19, (i) inhale droplets containing SARS-CoV-2 virus near the infected person or in a poorly ventilated area with the infected person; (ii) droplets and particles containing SARS-CoV-2 virus land on the eyes, nose, or mouth, especially from coughing, sneezing, or squirting like talking and singing; (iii) hands in direct contact with the mucous membranes of the eyes, nose, mouth of after touching the surface contaminated with [22]. There are three stages of Covid-19 transmission, namely:

- (i) Stage 1: Asymptomatic (1-2 days after infection). The inhaled virus SARS-CoV-2 binds to epithelial cells in the nasal cavity and begins to multiply. In vitro data from

SARS-CoV-2 show that ciliated cells are primary cells infected with airways. At this stage, the virus can be detected by nasal swabs [23].

- (ii) Stage 2: Upper airway response and airway conduction (within a few days). The virus propagates through the airway ducts, triggering a stronger innate immune response (Fig. 2)



**Fig. 2. A cell infected with SARS-CoV-2 particles (red; artificially coloured) [23].**

- (iii) Stage 3: Hypoxia. The virus reaches the gas exchange unit in the lung and infects type II alveolar cells. Both SARS-CoV-2 and influenza preferentially infect type II cells compared to type I cells [24]. The infected alveolar unit is more peripheral and subpleural. SARS-CoV-2 proliferates in type II cells, releasing a large numbers of viral particles, causing the cells to undergo apoptosis and die [25].

### **2.3. COVID-19 preventative actions**

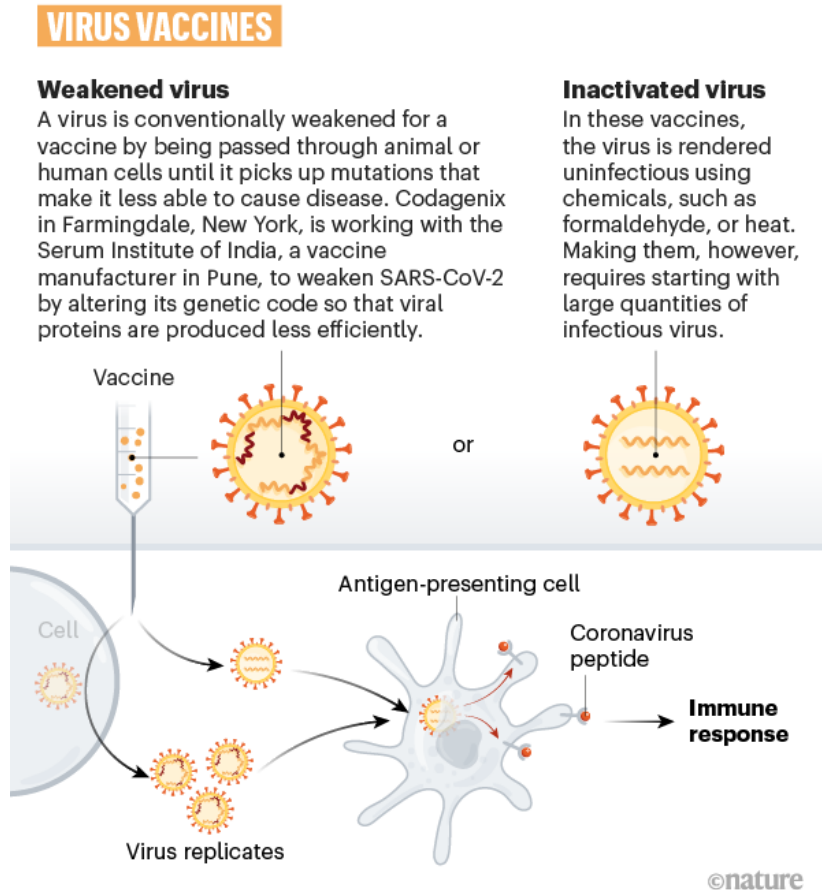
COVID-19 can be prevented by pharmaceutical (vaccination) and non-pharmaceutical means (masking, physical distance, hand hygiene) [22]. In terms of vaccines, the COVID-19 vaccine uses several media such as the use of nucleic acids, virus-like particles, recombinant proteins, attenuated viral approaches and inactivated viruses [26]. Figure 3 shows an illustration of injectable vaccines, some vaccines use the virus itself, in an attenuated or inactivated form like Sinovac Biotech for SARS-CoV-2.

### **2.4. Science lesson**

Knowledge of COVID-19 is part of science lessons because it discusses natural phenomena [7] in the form of evidence of facts, principles, arguments, laws, and concepts through a series of scientific method activities [27]. Science subjects consist of biology, physics, and chemistry. Science is a subject that must be studied at Special

School, and COVID-19 is included in the biological sciences. Knowledge related to COVID-19 needs to be given to students with hearing impairments [4], which is currently a disease outbreak throughout the world and is related to natural phenomena.

Learning materials that need to be conveyed, understanding the COVID-19, symptoms of the coronavirus, coronavirus causes, coronavirus spread, coronavirus prevention, and coronavirus vaccine [21].



**Fig. 3. Injectable vaccines [21].**

### 2.5. Distance learning procedure

The learning methods commonly used in special schools are questions and answers, lectures or presentations, discussions, and demonstrations. Learning procedures carried out in schools combine strategy with the method [28-30]. The teacher in delivering the material to the students combined the question-and-answer method, presentation or lecture, and demonstration with the think, talk, write strategy. This think talk write strategy [31] is a learning strategy consisting of three stages, namely: (i) thinking activity (think), students with hearing impairments carry out the process of listening or paying close attention to the teacher's explanation related to COVID-

19; (ii) speaking activity (talk), students with hearing impairments explore themselves by communicating knowledge of COVID-19 using speech in the form of knowledge in sentences; (iii) activity of compiling sentences (write), students with hearing impairments compose knowledge of COVID-19 by using sentences. Figure 4 shows three activities are carried out sequentially in learning. These three activities are carried out on each material studied, all subject matter (Fig. 4).



Fig.4. Learning materials.

Figure 4 consists of the definition of the 2019-nCoV coronavirus, symptoms of the coronavirus, the causes of the coronavirus, the spread of the coronavirus, prevention of the coronavirus, and the coronavirus vaccine. All pictures are equipped with writing, so that students can understand the material being studied [28]. Facilities and infrastructure such as cell phones/computers, internet networks, zoom or google meet applications, and others are completeness in supporting the distance learning process for students with hearing impairments [18, 31].

### 3. Method

This study used an experimental method with 3 times distance learning in each special school. The aspects measured in the test instrument are, (i) the origin of the COVID-19; (ii) symptoms of COVID-19; (iii) record of transmission, and prevention of the COVID-19. The number of questions is 25, the score is given a weight of 2, and the maximum score is 50. Data processing techniques with nonparametric statistics, using the sign test. The mark used is the minimum completeness criteria (KKM) of mastery of 60% or a score of 30.

The data processing formula is shown in Eq. (1) :

$$P = P\left(X \geq x, \text{if } p = \frac{1}{2}\right) = 1 - P\left(X \leq x, \text{if } p = \frac{1}{2}\right) \quad (1)$$

Hypothesis formulation :

- Ho:  $M = M_o$ , or  $M = 30$
- H1:  $M > M_o$ , or  $M > 30$

Description:

- KKM =  $M_o = 30$ , negative sign (-), if  $< 30$ , positive sign (+), if  $> 30$ , and 0, if = 30.
- Confidence level = 0.05
- Hypothesis testing criteria;
- Ho is rejected if  $p \leq \alpha$  (0.05)
- Ho is accepted if  $p > \alpha$  (0.05)

## 4. Results and Discussion

### 4.1. Research results

The online test score for all hearing-impaired students in a special school for students with hearing impairments are 24, the results for the COVID-19 subject matter are as shown in Table 1.

**Table 1. Online examination results of students with hearing impairments in four special school.**

No.	Name	Special School	Student Score (M)	KKM (Mo)	Sign
1	And	JBR	32	30	+
2	Agn	JBR	30	30	0
3	Mdi	JBR	38	30	+
4	Sov	JBR	32	30	+
5	Ujm	JBR	36	30	+
6	Nur	JBR	42	30	+
7	Nur	JBR	34	30	+
8	Rvs	JTH	30	30	0
9	Msk	JTH	28	30	-
10	Dne	JTH	28	30	-
11	Nvl	JTH	38	30	+
12	Sab	JTH	36	30	+
13	Mal	JTH	24	30	-
14	Nmu	JTH	24	30	-
15	Npu	BLI	32	30	+
16	Moc	BLI	28	30	-
17	Sfa	BLI	30	30	0
18	Ika	BLI	34	30	+
19	Ipu	BLI	30	30	0
20	Iko	BLI	25	30	-
21	Apu	JTR	38	30	+
22	Wse	JTR	38	30	+
23	Auh	JTR	30	30	0
24	Bad	JTR	24	30	-

\*Notes: JBR: West Java, JTH: Central Java, JTR: East Java, BLI: Bali

Based on Table 1, the calculation results can be seen in the following :

- binomial table with  $n = 24 - 5 = 19$ , because there is
- $M = Mo = 5$ , and  $x (+) = 12$ ;
- $P = P(X \geq 12, \text{ if } p = \frac{1}{2}) = 1 - P(X \leq 12, \text{ if } p = \frac{1}{2}) = 1 - 0.9165 = 0.0835$ ;
- then  $p > 0.05$ .

Based on the testing criteria,  $H_0$  is accepted, the conclusion is that the think talk write strategy used in distance learning, the knowledge of students with hearing impairments about COVID-19 does not reach the minimum completeness criteria.

The distance learning system for students with hearing impairments has an impact, namely the lack of maximum direct learning interaction between teachers and students. Communication barriers between teachers and students cannot be in direct contact

because they are not within the reach of the educator's touch [3] so orders often do not reach students with hearing impairments and are difficult to convey. This causes the activities of listening, speaking, and writing cannot be controlled properly by the teacher [32].

Instruments to measure mastery of COVID-19 material consist of application-level cognitive, and the form of multiple-choice with three choice tests with randomization of questions and alternative answer choices, and online and computer-based test (CBT) which have an impact on learning outcomes that are still below minimum completeness criteria [33]. The shape of the questions is made in various types, especially for the knowledge and understanding section which functions to control and see the stability of the ability of the hearing-impaired students. It turns out that the diversity of the shape of the questions influences the learning outcomes of all students with hearing impairments who are still below the criteria for minimum completeness [33].

Communication facilities such as mobile phones, computers, internet networks, internet quotas, which are not always owned by students with hearing impairments, are obstacles in participating in online learning. Distance learning has not given maximum results, for students with hearing impairments at a certain level. [34, 35].

The minimum completeness criteria used are high. Many students cannot reach the predetermined mastery limit. Although the think take write strategy influences the knowledge of students with hearing impairments [32], it is still below the minimum completeness criteria.

## 4.2. Mastery of coronavirus (COVID-19) materials for each special school

The results of the online exam results from each special school for COVID-19 material analysed in each school are as follows:

### 4.2.1. Special school JBR

Data on online exam results for students with hearing impairments on COVID-19 material at Special school JBR, as shown in Table 2.

**Table 2. Online examination results of students with hearing impairments at special school JBR.**

No.	Name	Special School	Student Score (M)	KKM (Mo)	Sign
1	And	JBR	32	30	+
2	Agn	JBR	30	30	0
3	Mdi	JBR	38	30	+
4	Sov	JBR	32	30	+
5	Ujm	JBR	36	30	+
6	Nur	JBR	42	30	+
7	Nur	JBR	34	30	+

\*Notes: JBR: West Java

Based on Table 2, the calculation results can be seen in the following :

- binomial table with  $n = 7 - 6 = 1$ , because there is
- $M = Mo = 1$ , and  $x (+) = 6$ ;



- $P = P(X \geq 6, \text{ if } p = \frac{1}{2}) = 1 - P(X \leq 6, \text{ if } p = \frac{1}{2}) = 1 - 1 = 0$ ;
- then  $p < 0.05$ .

Based on the test criteria,  $H_0$  was rejected, in conclusion, the think talk write strategy used at Special school JBR in distance learning, the knowledge of students with hearing impairments about COVID-19 reached the minimum completeness criteria.

The achievement of knowledge of hearing-impaired students is caused by the use of thinking, speaking, and writing strategies in accordance with learning materials, which are equipped with picture media as support, this is in accordance with the visual characteristics of hearing-impaired students in special school JBR [32]. The completeness of learning media and school infrastructure in supporting the learning process has an impact on the achievement of hearing-impaired students to achieve the minimum completeness criteria in special school JBR [31]. The level of knowledge of hearing-impaired students is influenced by the vocabulary mastered, simple words in the questions have a positive impact on the level of knowledge of students in special school JBR [8].

#### 4.2.2. Special school JTH

Data on online exam results for students with hearing impairments on COVID-19 material at special school JTH, as shown in Table 3.

**Table 3. Online examination results of students with hearing impairments at special school JTH.**

No.	Name	Special School	Student Score (M)	KKM (Mo)	Sign
1	Rvs	JTH	30	30	0
2	Msk	JTH	28	30	-
3	Dne	JTH	28	30	-
4	Nvl	JTH	38	30	+
5	Sab	JTH	36	30	+
6	Mal	JTH	24	30	-
7	Nmu	JTH	24	30	-

\*Notes: JTH: Central Java

Based on Table 3, the calculation results can be seen in the following :

- binomial table with  $n = 7 - 1 = 6$ , because there is
- $M = Mo = 1$ , and  $x (+) = 2$ ;
- $P = P(X \geq 2, \text{ if } p = \frac{1}{2}) = 1 - P(X \leq 2, \text{ if } p = \frac{1}{2}) = 1 - 0.3438 = 0.6562$ ;
- then  $p > 0.05$ .

Based on the testing criteria,  $H_0$  is accepted, in conclusion, the think talk write strategy used at Special school JTH in distance learning, the knowledge of students with hearing impairments about COVID-19 is still below KKM.

The distance learning system for hearing impaired students has an impact, namely the lack of maximum direct learning interaction between educators and students. Communication barriers between teachers and students cannot be in direct contact because they are not within the reach of the educator's touch [3] so that orders often do not arrive and it is difficult to convey to students with hearing impairments, so the

learning outcomes at Special school JTH do not reach the criteria for completeness minimum. This causes the activities of listening, speaking, and writing cannot be controlled properly by the teacher [32].

Instruments to measure mastery of COVID 19 material consist of application-level cognitive, and the form of multiple-choice three-choice tests with randomization of questions and alternative answers, and online and CBT which have an impact on learning outcomes at Special school JTH which is still below the criteria for maximum completeness [33]. The shape of the questions was made varied with various types, especially for the knowledge and understanding section which functions to control and see the stability of the ability of hearing-impaired students, it turns out that the diversity of items influences the learning outcomes of all hearing-impaired students in special school JTH which are still below the criteria for maximum completeness [33].

Communication facilities such as mobile phones, computers, internet networks, internet quotas, which are not always owned by students with hearing impairments, are obstacles in participating in online learning. Distance learning has not yet given maximum results, for students with hearing impairments at a certain level at Special school JTH [34, 35].

The minimum completeness criteria used are high, so many students cannot reach the predetermined completeness limit. the think talk write strategy has an effect on increasing the knowledge of students with hearing impairments [32], but it is still below the minimum completeness criteria.

#### 4.2.3. Special school BLI

Data on online exam results for students with hearing impairments on COVID-19 material at Special school BLI, as shown in Table 4.

**Table 4. Online examination results of students with hearing impairments at special school BLI.**

No.	Name	Special School	Student Score (M)	KKM (Mo)	Sign
1	Npu	BLI	32	30	+
2	Moc	BLI	28	30	-
3	Sfa	BLI	30	30	0
4	Ika	BLI	34	30	+
5	Ipu	BLI	30	30	0
6	Iko	BLI	25	30	-

\*Notes: BLI: Bali

Based on Table 4, the calculation results can be seen in the following :

- binomial table with  $n = 6 - 2 = 4$ , because there is
- $M = Mo = 1$ , and  $x (+) = 2$ ;
- $P = P(X \geq 2, \text{ if } p = \frac{1}{2}) = 1 - P(X \leq 2, \text{ if } p = \frac{1}{2}) = 1 - 0.6875 = 0.312$ ;
- then  $p > 0.05$ .

Based on the test criteria,  $H_0$  is accepted, in conclusion, the think talk write strategy used at Special school BLI in distance learning, the knowledge of students with hearing impairments about COVID-19 is still below the minimum completeness criteria.

The distance learning system for students with hearing impairments has a less than maximum impact on learning interactions between educators and students with hearing impairments. Communication barriers between educators and students cannot be in direct contact because they are not within the reach of the educator's touch [3] so orders often do not reach students with hearing impairments and are difficult to convey. As a result, the activities for listening, speaking, and writing cannot be controlled properly by the teacher, so learning outcomes are still below the minimum ability criteria in special school BLI [32].

Instruments to measure mastery of COVID 19 material consist of application-level cognitive, and the form of a multiple-choice test with three answer choices by randomizing questions and alternative answer choices, and online and CBT having an impact on learning outcomes at Special school BLI, which is still below the criteria for maximum completeness [33]. The shape of the questions is made in various types, especially for the knowledge and understanding section which functions to control and see the stability of the abilities of students with hearing impairments. It turns out that the diversity of items influences the learning outcomes of all students with hearing impairments in special school BLI which are still below the criteria for maximum completeness.

Communication facilities such as mobile phones, computers, internet networks, internet quotas, which are not always owned by students with hearing impairments, are obstacles in participating in online learning. Distance learning has not yet given maximum results, for students with hearing impairments at a certain level at Special school BLI [34, 35].

The minimum completeness criteria used are high, so many students cannot reach the predetermined completeness limit. think talk write strategy affects increasing the knowledge of students with hearing impairments [32], but it is still below the minimum completeness criteria.

#### 4.2.4. Special school JTR

Data on online exam results for students with hearing impairments on COVID-19 material at Special school JTR, as shown in Table 5.

**Table 5. Online examination results of students with hearing impairments at special school JTR.**

No.	Name	Special School	Student Score (M)	KKM (Mo)	Sign
1	Apu	JTR	38	30	+
2	Wse	JTR	38	30	+
3	Auh	JTR	30	30	0
4	Bad	JTR	24	30	-

\*Notes: JTR: East Java

Based on Table 5, the calculation results can be seen in the following :

- binomial table with  $n = 4 - 1 = 3$ , because there is
- $M = Mo = 1$ , and  $x (+) = 2$ ;
- $P = P(X \geq 2, \text{ if } p = \frac{1}{2}) = 1 - P(X \leq 2, \text{ if } p = \frac{1}{2}) = 1 - 0.8750 = 0.1250$ ;
- then  $p > 0.05$ .

Based on the test criteria,  $H_0$  was rejected, in conclusion, the think talk write strategy used at Special school JTR in distance learning, the knowledge of students with hearing impairments about COVID-19 did not reach the minimum completeness criteria.

The distance learning system for students with hearing impairments has a less than maximum impact on learning interactions between educators and students with hearing impairments. Communication barriers between educators and students cannot be in direct contact because they are not within the reach of the educator's touch [3] so orders often do not reach students with hearing impairments and are difficult to convey. As a result, the activities for listening, speaking, and writing cannot be controlled properly by the teacher, so learning outcomes are still below the minimum ability criteria at Special school JTR [32].

Instruments to measure mastery of COVID 19 material consist of application-level cognitive, and the form of a multiple-choice test with three answer choices by randomizing questions and alternative answer choices, and online and CBT having an impact on learning outcomes at Special school JTR which is still below the criteria for maximum completeness [33]. The shape of the questions was made varied with various types, especially for the knowledge and understanding section which functions to control and see the stability of the ability of students with hearing impairments, it turns out that the diversity of items influences the learning outcomes of all students with hearing impairments in special school JTR which are still below the criteria for maximum completeness [33].

Communication facilities such as mobile phones, computers, internet networks, internet quotas, which are not always owned by students with hearing impairments, are obstacles in participating in online learning. Distance learning has not yet given maximum results, for students with hearing impairments at a certain level at Special school JTR [34, 35].

The minimum completeness criteria used are high, so many students cannot reach the predetermined completeness limit. The think talk write strategy affects increasing the knowledge of students with hearing impairments [32], but it is still below the minimum completeness criteria.

## **5. Conclusion**

Distance learning using think, talk, and write strategies and supported by the use of lecture or presentation methods, question and answer, and demonstrations analysed as a whole, all special school data were combined, the results were able to increase the knowledge of students with hearing impairments about COVID-19 passing the minimum completeness criteria (cut off score) of 60% (score 30) from the ideal score of 50. However, if we analyse each school, only one special school JBR has increased knowledge about COVID-19. Special school JTH, special school JTR, and special school BLI the knowledge of students with hearing impairments do not reach the minimum completeness criteria. Distance learning provides a distance between students with hearing impairments and teachers, while students with hearing impairments experience hearing difficulties, resulting in communication that does not reach students with hearing impairments and is not responded to. The test instrument was not made by the teacher of each student with hearing impairments but made by the researcher, it is possible to use words that are not commonly used by students with hearing impairments and their teachers, even though indicators and examples of

evaluation instruments are already in the lesson plans given to teachers to be taught. The minimum completeness criteria used are still high for students with hearing impairments in distance learning who are not used to being used so that many students with hearing impairments cannot reach the predetermined mastery limit.

### Acknowledgments

In this opportunity, the authors of the journal would like to express their gratitude to:

- (i) Universitas Pendidikan Indonesia, which has facilitated and provided the opportunity to write journals until they are published.
- (ii) Special Schools for students with hearing impairments in Bandung, Wonosobo, Surabaya, and Bali, which have provided a place to conduct research.
- (iii) All teachers who serve as teachers in distance learning at Special School.
- (iv) All students with hearing impairments, who are subjects in this study.

### References

1. Supena, A.; and Muskania, R.T. (2020). Implementasi pembelajaran di sekolah dasar inklusi bagi tunarungu selama covid-19. *Auladuna: Jurnal Pendidikan Dasar Islam*, 7(2), 202-214.
2. Maryanti, R.; Hufad, A.; Sunardi, S.; Nandiyanto, A.B.D.; and Al-Obaidi, A.S.M. (2020). Understanding covid-19 particle contagion through aerosol droplets for students with special needs. *Journal of Engineering Science and Technology (JESTEC)*, 15(3), 1909-1920.
3. Maryanti, R.; Nandiyanto, A.B.D.; Hufad, A.; and Sunardi, S. (2021). Science education for students with special needs in Indonesia: from definition, systematic review, education system, to curriculum. *Indonesian Journal of Community and Special Needs Education*, 1(1), 1-8.
4. Dostal, H.M.; Wolbers, K.; Ward, S.; and Saulsburry, R. (2021). A national survey of teachers of the deaf on disciplinary writing. *Exceptionality*, 29(2), 95-113.
5. Zendrato, W. (2020). Gerakan mencegah daripada mengobati terhadap pandemi covid-19. *Jurnal Education and Development*, 8(2), 242-242.
6. Radissa, V.S.; Wibowo, H.; Humaedi, S.; and Irfan, M. (2020). Pemenuhan kebutuhan dasar penyandang disabilitas pada masa pandemi Covid-19. *FOCUS: Jurnal Pekerjaan Sosial*, 3(1), 61-69.
7. Susetyo, B.; Maryanti, R.; and Siswaningsih, W. (2021). Students with hearing impairments' comprehension level towards the exam questions of natural science lessons. *Journal of Engineering Science and Technology (JESTEC)*, 16(2), 1825-1836.
8. Ichsana, I.Z.; Dewi, A.K.; Hermawati, F.M.; and Iriani, E. (2018). Pembelajaran IPA dan lingkungan: Analisis kebutuhan media pembelajaran pada SD, SMP, SMA di Tambun Selatan, Bekasi. *Jipva: Jurnal Pendidikan IPA Veteran*, 2(2), 131-140.
9. Widia, Y.A. (2013). Pemerolehan kosakata anak tunarungu berdasarkan kelas kata bahasa indonesia di SDLB Karya Mulia II Surabaya: Kajian psikolinguistik. *Skriptorium*, 1(2), 129-142.
10. Hennes, A.K.; Büyüknarci, Ö.; Rietz, C.; and Grünke, M. (2015). Helping children with specific learning disability to improve their narrative writing

- competence by teaching them to use the story maps strategy. *Insights on Learning Disabilities*, 12(1), 35-56.
11. Nuraeni, R.; and Luritawaty, I.P. (2016). Mengembangkan kemampuan komunikasi matematik siswa melalui strategi think talk write. *Mosharafa: Jurnal Pendidikan Matematika*, 5(2), 101-112.
  12. Maydasari, M.; Margiati, M.; and Halidjah, S. (2018) Pengaruh strategi think talk write terhadap hasil belajar matematika kelas iv sekolah dasar. *Jurnal Pendidikan dan Pembelajaran Khatulistiwa*, 7(7), 1-10.
  13. Sinaga, A.R. (2019). The effect of think talk write strategy to the students ability in writing descriptive text. *Jurnal Pendidikan Indonesia*, 4(1), 360-366.
  14. Kurniaman, O.; Yuliani, T.; and Mansur, M. (2018). Investigating think talk write (ttw) learning model to enhance primary students' writing skill. *JTLEE: Journal of Teaching and Learning in elementary Education*, 1(1), 52-59.
  15. Suminar, R.P.; and Putri, G. (2018). The effectiveness of TTW (think-talk-write) strategy in teaching writing descriptive text. *Academic Journal Perspective: Education, Language, and Literature*, 2(2), 300-305.
  16. Rahmawati, M.S. (2020). Meningkatkan hasil belajar matematika materi pokok bilangan pada peserta didik mi negeri karang poh pulosari pemalang melalui strategi think talk write (ttw). *Indonesian Journal of Educationalist*, 1(2), 199-210.
  17. Artayasa, I.P.; Fitriani, T.; Handayani, B.S.; and Kusmiyati, K. (2021). Efektivitas penerapan model pembelajaran think talk write (ttw) secara online terhadap literasi informasi siswa SMA. *Jurnal Kependidikan: Jurnal Hasil Penelitian dan Kajian Kepustakaan di Bidang Pendidikan, Pengajaran dan Pembelajaran*, 7(3), 641-648.
  18. Sultanto, M.A.; Al Afghani, R.I.; Meisya, S.D.; Salsabila, I.A.; Rohimat, S.S.; and Stephani, M R. (2022). Physical education online class for students with hearing impairment during covid-19 pandemic. *Indonesian Journal of Community and Special Needs Education*, 2(2), 149-158.
  19. Herlianti, J.J. (2015). Pelaksanaan pembelajaran ipa bagi anak tunarungu. *Jurnal Penelitian Pendidikan Khusus*, 4(1), 60-71
  20. Mittal, A.; Manjunath, K.; Ranjan, R.K.; Kaushik, S.; Kumar, S.; and Verma, V. (2020). COVID-19 pandemic: Insights into structure, function, and hACE2 receptor recognition by SARS-CoV-2. *PLoS Pathogens*, 16(8), e1008762.
  21. Liu, Y.; Ning, Z.; Chen, Y.; Guo, M.; Liu, Y.; Gali, N.K. ; and Lan, K. (2020). Aerodynamic characteristics and RNA concentration of SARS-CoV-2 aerosol in wuhan hospitals during COVID-19 outbreak. *Nature*, 582(7813), 557-560.
  22. Lotfi, M.; Hamblin, M.R.; and Rezaei, N. (2020). COVID-19: Transmission, prevention, and potential therapeutic opportunities. *Clinica Chimica Acta*, 508, 254-266.
  23. Mason, R.J. (2020). Pathogenesis of COVID-19 from a cell biology perspective. *European Respiratory Journal*, 55(4), 2000607.
  24. Mossel, E.C.; Wang, J.; Jeffers, S.; Edeen, K.E.; Wang, S.; Cosgrove, G.P.; and Mason, R.J. (2008). SARS-CoV replicates in primary human alveolar type II cell cultures but not in type I-like cells. *Virology*, 372(1), 127-135.
  25. Weinheimer, V.K.; Becher, A.; Tönnies, M.; Holland, G.; Knepper, J.; Bauer, T. T.; and Hocke, A.C. (2012). Influenza a viruses target type II pneumocytes in the

- human lung. *The Journal of Infectious Diseases*, 206(11), 1685-1694.
26. Elidya, A.; Nasser, G.; Dhanu, I.; Himayani, R.; and Ismunandar, H. (2021). Vaksin corona virus disease 2019. *Medical Profession Journal of Lampung*, 11(1), 141-144.
  27. Subali, B.; Kumaidi, K.; Aminah, N.S.; and Sumintono, B. (2019). Student achievement based on the use of scientific method in the natural science subject in elementary school. *Jurnal Pendidikan IPA Indonesia*, 8(1), 39-51.
  28. Hidayat, D.S.; Rahmat, C.; Fattah, N.; Rochyadi, E.; Nandiyanto, A.B.D; and Maryanti, R. (2020). Understanding Archimedes law: What the best teaching strategies for vocational high school students with hearing impairment. *Journal of Technical Education and Training*, 12(1), 229-237
  29. Nandiyanto, A.B.D.; Asyahidda, F.N.; Danuwijaya, A.A.; Abdullah, A.G.; Amelia, N.I.A.; Hudha, M.N.; and Aziz, M. (2018). Teaching “nanotechnology” for elementary students with deaf and hard of hearing. *Journal of Engineering Science and Technology (JESTEC)*, 13(5), 1352-1363.
  30. Rusyani, E.; Maryanti, R.; Muktiarni, M.; and Nandiyanto, A.B.D. (2021). Teaching on the concept of energy to students with hearing impairment: changes of electrical energy to light and heat. *Journal of Engineering Science and Technology (JESTEC)*, 16(3), 2502-2517.
  31. Atmojo, I. R. W. (2014). Peningkatan keterampilan membaca pemahaman melalui penerapan strategi think talk write (ttw). *Didaktika Dwija Indria*, 2(11), 1-5
  32. Rusyani, E.; Karyana, S.E.; Susetyo, B.; and Putri, S.R. (2021). think-talk-write strategy to improve the ability to compose Indonesian sentence structure in slbn cicendo bandung, indonesia. *Indonesian Journal of Educational Research and Technology*, 1(3), 145-150.
  33. Meirista, E.; Rahayu, M.; and Lieung, K.W. (2020). Analisis penggunaan model think talk and write berbantuan video pada mahasiswa disabilitas. *Jurnal Pendidikan Edutama*, 7(2), 9-16.
  34. Andhini, A.B.; and Sakti, A.W. (2021). Impact of distance learning on reading and writing ability in elementary school students. *Indonesian Journal of Multidisciplinary Research*, 1(2), 393-398
  35. Riyanto, M.; Nandiyanto, A.B.D.; Kurniawan, T.; and Bilad, M.R. (2022). Management of character education in the scope of elementary school students in the distance learning period. *Indonesian Journal of Multidisciplinary Research*, 2(1), 1-8.