# Implementation of Learning Modules to Improve the Oral Communication Skills of Class IV Elementary School Students

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#### Abstract

The oral communication skills of students in elementary schools are not yet optimal. The aim of this research is to find out about: 1) learning modules needed by educators to improve the oral communication skills of elementary school students, 2) learning modules that can improve the oral communication skills of elementary school students. The subjects of this research were fourth grade elementary school students who experienced difficulties with oral communication and the object of this research was the learning module. This research uses a descriptive qualitative research design. Data was collected through observation, interviews and documentation. The research results show that students are very interested in this learning module. This learning module can improve the oral communication skills of elementary school students is very suitable and effective for use in student learning. Therefore, this learning module is considered very interesting and effective to use. It is hoped that this research can be continued by adding material to the learning module and implementing it in the further learning process. **Keywords:** Learning module, Oral communication. Elementary school

#### Abstrak

Keterampilan komunikasi lisan peserta didik di sekolah dasar belum maksimal. Tujuan dari penelitian ini adalah untuk mengetahui tentang: 1) modul pembelajaran yang dibutuhkan pendidik untuk meningatkan kemampuan komunikasi lisan peserta didik sekolah dasar, 2) modul pembelajaran dapat meningkatkan kemampuan komunikasi lisan peserta didik sekolah dasar. Subjek dari penelitian ini peserta didik kelas IV sekolah dasar yang mengalami kesulitan komunikasi lisan dan objek penelitian ini adalah modul pembelajaran. Penelitian ini menggunakan desain penelitian kualitatif deskriptif. Data dikumpulkan melalui pengamatan observasi, wawancara, dan dokumentasi. Hasil penelitian menunjukkan bahwa peserta didik sangat tertarik dengan modul pembelajaran ini. modul pembelajaran ini dapat meningkatkan kemampuan komunikasi lisan peserta didik sekolah dasar selain itu, validasi materi dan media pembelajaran juga menyatakan bahwa modul ini sangat sesuai dan efektif untuk digunakan dalam pembelajaran peserta didik. oleh karena itu, modul pembelajaran ini dianggap sangat menarik dan efektif untuk digunakan. penelitian ini diharapkan dapat diteruskan dengan penembelajaran lebih lanjut.

Kata kunci: Modul pembelajaran, Komunikasi lisan. Sekolah dasar

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## INTRODUCTION

Education in elementary schools has a crucial role in forming students' academic and social foundations. Indonesian language lessons have an important role for students so they can master good language skills. Students' activeness in discussions can help them practice verbal communication and make it easier to understand the material (Miranti, et al, 2020). Oral communication skills are very important because they are included in the 4C skills (Critical thinking, Communication, Collaboration, and Creativity) which are very important in the world of education today (Atika Putri et al., 2022).

Communication skills are one of the 4Cs that must be mastered in the 21st century like today (Ashim et al 2019). Communication skills are a person's ability to exchange knowledge either in getting new information or providing correct information (Farhrohman, 2017). Communication is a feeling and idea that can be expressed through verbal or written communication (Anderha & Maskar, 2020). Communicating can be defined as the activity of providing an image or way of thinking to other people. Like an educator when explaining material to students, educators provide verbal and written descriptions so that the material can be understood by students (Yulianto & Suprihatiningsih 2019). In the learning process, education is really needed in interaction, especially communicating with students in order to find out the extent of students' understanding in receiving learning material (Putu, 2019).

In the opinion of Ana & Adi, (2023) so that communication goes well there are several ways that can be done, namely: (1) Look at the person you are talking to (2) His voice sounds clear (3) A pleasant facial expression (4) Good grammar, and (5) The discussion is easy to understand, short and clear. Apart from that, according to Rohaina (2020), there are five factors that influence language development in children which affect communication skills, namely (1) the child's age and physical factors, (2) the environmental conditions in which the child grows and develops, (3) the child's intelligence, (4) Family socio-economic status, and (5) physical condition of the child. So it can be concluded that oral communication skills refer to a person's ability to produce and understand spoken language that is appropriate and can be understood by other people, both in general and learning situations. This includes the ability to produce appropriate speech and understand the message of the person you are talking to.

Communication skills have four indicators in the learning process, namely: 1). Able to express ideas and thoughts effectively, 2). Able to listen effectively, 3). Able to convey information well, 4). Use good and effective language (Budiono & Ab-durrohim, 2020). Students' oral communication skills play an important role in better learning, with the emergence of social interactions between students and students and students and educators. Students' oral communication skills must be stimulated by learning that is able to explore abilities which are owned students (Wahyuningsih, et al, 2022). Communication has categorization based on the number of participants involved, such as interpersonal communication, group communication, organizational communication, and mass communication. Communication is a group of people interacting with each other to achieve a common goal, making them an inseparable part of the group. Each member has a different role in implementation (Karyaningsih, 2020:30).

Students' communication skills can also be influenced by internal factors of the students themselves, for example students' self-efficacy. Research results from (Astuti & Pratama, 2020) found that self-efficacy has a positive and significant relationship with communication skills. Research results according to (Budiono and Abdurrohim, 2020) found that indicators of students' communication skills include: 1) Able to express ideas and thoughts effectively. 2) Able to listen effectively. 3) Able to convey information well. 4) Use good and effective language.

Safitri et al (2022) revealed that there are aspects of oral communication that students are expected to master, namely: 1) students are expected to be able to speak politely about various familiar topics using appropriate volume and intonation according to the context, 2) students are able to respond by asking about something, answering, and responding to other people's comments (friends, teachers, and adults) well and politely in a conversation, 3) students are able to express ideas orally with or without the help of pictures/illustrations, 4) students are able to retell the content of information they read or heard; and retelling narrative texts read or read on the topic of self and environment. Based on discussions with class IV educators at SDN 01 Bandar Sari, there are still many class IV students who experience difficulties in oral communication. This is proven by the results of observations in the pre-cycle stage which show that out of 30 students, only 9 students have communication skills. orally is enough. 11 students have moderate oral communication skills and 10 others have poor oral communication skills.

Implementation of interesting learning modules can improve oral communication skills in class IV SDN 01 Bandar Sari. Learning modules are teaching materials that are created according to students' needs to facilitate the learning process (Herlina & Hadiyanti, 2021). A module is a form of teaching material that is packaged completely and systematically, containing a set of planned and designed learning experiences to help students master specific learning objectives (Nabila & Wirnita, 2021). According to Susanti (2017: 160) "a module is a teaching material that is specially designed, systematic, and equipped with instructions that contain learning experiences by organizing subject matter that allows it to be studied independently or guided."

Based on the results of interviews and document studies on class IV Indonesian language learning modules in elementary schools, learning modules are already available, but learning activities have not yet led to oral communication learning. This research focuses on the oral communication learning module. Based on the urgency of the learning module and the unavailability of research discussing the learning module, it is necessary to design an oral communication learning module for Indonesian language subjects in class IV elementary school. However, before creating a learning module, researchers need to know the need to design a learning module that is suitable for class IV students. Thus, the aim of this research is to determine the need for oral communication learning modules for Indonesian language subjects in class IV elementary school.

Regarding this need, researchers conducted an analysis of the need for learning modules to improve oral communication skills. Based on interviews with fourth grade educators, students need material that focuses on oral communication. Researchers concluded that the module was the right teaching material to develop. A module is a certain type of learning activity unit that is planned or arranged to support the learning goals of each student (Arini, 2024). Students can easily and independently learn using modules because they can be used anytime and anywhere (Daryanto, 2013). Learning modules also provide special benefits for students because each student can learn according to their level of ability and learning speed.

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It is hoped that this research can provide concrete and practical solutions for educators at driving schools in improving students' oral communication skills. In this way, it is hoped that students can interact more easily with the surrounding environment and achieve better academic achievements. Apart from that, the projects carried out can also be tailored to the needs and interests of students so that they are more interested and motivated in developing their speaking skills. By using interesting learning modules, it is hoped that class IV students at SDN 01 Bandar Sari can improve their oral communication skills and achieve better academic achievements.

## METHOD

This research uses a qualitative research approach, specifically descriptive qualitative. Descriptive qualitative research is used to explain a social phenomenon, as well as the attitudes of social actors towards existing phenomena, the data obtained is described in the form of narrative or words and images (Ikhwani, 2022). This research was carried out using a qualitative analysis approach and prioritized the process from the subject's perspective as the main data source so that it became more interactive and flexible.

This research was carried out in the first week of June 2023. The research location was chosen in Way Kanan for the 2022/2023 academic year. In collecting research data, non-participant observation was used, where the researcher did not participate directly in the learning activities in the classroom, but the researcher only observed the ongoing learning process. For this reason, researchers will observe the learning situation in class and take notes directly during the learning process by referring to indicators of students' communication skills. An interview is a meeting of two people to exchange information and ideas through questions and answers, so that meaning can be constructed on a particular topic (Sugiyono, 2015:319).

The data taken from research subjects are oral communication skills and the implementation of project based learning. Oral communication ability data was obtained from observation sheets and interviews with teachers and students. Data on the implementation of project based learning were obtained from student activity observation sheets and teacher activity observation sheets. After the data is obtained, it is then analyzed using qualitative descriptive based on the results of observations and reflections from the entire cycle. Quantitative data analysis in the form of observations of students' oral communication skills whether they fall into the criteria of good, sufficient, or poor.

After the required data has been collected, data analysis will be carried out. Research data analysis was carried out using qualitative descriptive techniques, namely by describing and interpreting the data from each confirmed component (Makki, at.all., 2021). The data analysis technique uses four paths, namely: (1) data collection, (2) data condensation, (3) presenting data (data display), and (4) drawing conclusions or verification (conclusion drawing and verification). Using the research instrument itself is assisted by assessment instruments from BSNP (Hasanah, 2022).

## **RESULTS AND DISCUSSION**

Research Results Research was conducted on ongoing teaching and learning activities (KBM). with 7 themes about events in life. The learning process is carried out by observing and discussing the topic of the invitation letter. In this case, educa-tors use learning media such as birthday invitation letters. Referring to observations of the teaching and learning process in the classroom, it was found that a number of students were the main respondents in this research, namely students who became group leaders and conveyed the results of group discussions. These 5 students became the focus of observation according to the research objective, namely the students' oral

communication skills. The results of observations and interviews regarding the students' communication skills are as follows:.

No	Sub Variable		Category and Amount		
		Indicator	Good	Enough	Not enough
1 com		Convey ideas/thoughts	3	1	1
	Verbal	Use good and correct grammar	3	1	1
	commun ication	The way the students communicate is calm and confident	2	2	1
Total		8	4	3	
Percentage		53 %	27 %	20 %	

Tabel 1. Results of observations of the oral communication skills of class IV students at SDN 01 Bandar Sari

Observation results show that 53% of class IV students are able to communicate verbally in the good category; there are 27% of students in the quite good category; and 20% of students are in the poor category. So it can be concluded that class IV students at SDN 01 Bandar Sari have good oral communication skills. Based on the results of interviews with students, it was found that the majority of students' communication skills showed a good category because it was caused by several things such as the situation and learning process during class. It can be said that class IV students have an awareness that conveying ideas, opinions or discussion results in front of the class requires preparation. This preparation leads to the ability to understand the material and how to convey information well.

The students' narratives are also reflected in the teaching and learning process, that in conveying the results of the discussion, students become more fluent because of the aids in the form of discussion notes that are read out. The delivery becomes smooth, structured and uses language that is good enough and easy to understand between students. Based on the description of the findings above, it can be concluded that, students in grade IV have the ability and courage to communicate. This is important in building self-confidence and improving students' communication skills.

The communication skills of class IV students at SDN 01 Bandar Sari can be categorized as having good communication skills. Improving students' communica-tion skills is strongly supported by the process of teaching and learning activities in classes that have implemented thematic learning methods. Thematic learning can raise the enthusiasm and enthusiasm of students in receiving lessons and improve children's social attitudes. The importance of a competent social attitude is of course very closely related to the social problems that students have to face in the environment. Because to be able to interact well in society, social attitudes are the most important aspect (Arisandy, 2022).

Based on research results that show improvement, the learning process using a group assignment approach in class IV SDN 01 Bandar Sari, has provided space for students to be able to communicate verbally well starting from a small scope. Small groups with tasks that must be completed together increase students' interaction with each other in completing tasks. This opportunity can be a trigger or can hone students' courage and abilities in oral communication. Learning modules using the PjBL model influence students' oral communication skills.

Interesting learning modules can help and encourage students to speak in front of the class in presenting completed projects. Students must use polite language and express ideas clearly so that they can be understood by the whole class. By making

presentations, students can increase their confidence in public speaking and the ability to convey messages effectively. This is supported by research by Izati et al (2018) which suggests that presentations as an authentic assessment can prepare students with important skills needed for their future professional lives, one of which is communication skills.

Educators and students can provide feedback on every project they work on. According to Salamah (2022) feedback makes students experience a better learning experience and an increased sense of commitment to their own learning and the progress of their peers. Learners can get useful and constructive feedback to improve their oral communication skills (Rombean et al., 2021).

These challenges can be minimized with lots of practice and good preparation. This challenge can be overcome very well by students who are group representatives in conveying the results of the discussion. Educators have also instructed students during discussions to write down the results of the discussion that have been mutually agreed upon. Writing or notes on the results of the discussion help students to reunderstand the material and results of the discussion. Help students when speaking in front of the class convey the results of group discussions. These writings or notes can be supporting media that can be read when speaking or presenting. This helps make students more prepared, increases their self-confidence, so they can convey discussion results fluently in good, easy-to-understand language.

Based on the research findings above, class IV students at SDN 01 Bandar Sari have good communication skills. This is reflected in the students' ability to convey ideas/thoughts based on observations and discussion results in front of the class, students have used good and correct grammar as demonstrated by the use of language that is easy to understand, students are able to be calm and confident in conveying their results. discussions in front of the class, each student is able to rewrite their understanding of the discussion material that has been presented, and students are able to write neatly. These results are supported by the opinion (Safitri, et al, 2022) that the learning process which is accompanied by discussion and practical activities is able to motivate students to convey ideas and ideas based on what they observe.

Students' oral communication skills which are increasingly honed and im-proved are supported by students' enthusiasm for receiving lessons and support from educators who are able to motivate, guide and facilitate the learning process. This is in line with the findings (Budiono and Abdurrohim, 2020) that educators have the most important role in developing students' oral communication skills.

## CONCLUSION

Based on the results of research that has been carried out and the results of the study and discussion above, it can be concluded that the learning process in improving oral communication skills is still not optimally implemented in an appreciative manner and does not use a learning model specifically for learning Indonesian. This shows that there are still no learning modules available that lead to learning oral communication using a learning model specifically for learning oral communication.

Judging from the results of the research and discussion, a conclusion can be drawn that class IV students at SDN 01 Bandar Sari have good oral communication skills and have the ability and courage to communicate. This shows that 53% of class IV students are able to communicate verbally in the good category, 27% of students are in the quite good category, and 20% of students are in the poor category. Students' communication skills are supported by students' enthusiasm for receiving lessons, and educators' skills in motivating, guiding and facilitating an interactive and enjoyable learning process. Based on this conclusion, to improve the quality of oral communication learning in Indonesian language subjects in fourth grade elementary school, learning planning is needed, which in the Merdeka curriculum is known as

learning modules which contain learning steps that lead to students' oral communication activities.

## REFERENCE

- Anna, A. M., & Adi, W., (2023). Peningkatan Kemampuan Komunikasi Lisan Peserta Didik Sekolah Dasar Melalui Model Project Based Learning. Jurnal el-muhbib pemikiran & penelitian pendidikan dasar. Vol. 7, No. 1: 41-49.
- Anderha, R. R., & Maskar, S. (2020). Analisis Kemampuan Komunikasi Matematis Siswa Pada Pembelajaran Daring Materi Eksponensial. Jurnal Ilmiah Matematika Realistik, 1(2), 1–7. https://doi.org/10.33365/ji-mr.v1i2.438.
- Arini A., Seni A., & Agnestasia R. P. (2024). Model P-Ikadka Sebagai Solusi Mengembangkan Modul Ajar Apresiasi Dongeng Di Sekolah Dasar. Diksa : Jurnal Pendidikan Bahasa dan Sastra Indonesia. Vol. 10 No. 1. https://doi.org/10.33369/diksa.v10i1.34153
- Arisandy, M., Nurhasanah, & Jaelani, A.K. (2022), Pengaruh Metode Inquiry terhadap Sikap Sosial Siswa SD pada Mata Pelajaran IPS, dari DOI: https://doi.org/10.29303/jipp.v7i2b.582.
- Ashim, M., Asikin, M., Kharisudin, I., & Wardono, W. (2019). Perlunya Komunikasi Matematika dan Mobile Learning Setting Problem Based Learning untuk Meningkatkan Kemampuan 4C di Era Disrupsi. Seminar Nasional Matematika, 2, 687–697. https://journal.unnes.ac.id/sju/index.php/prisma/article/view/29239.
- Atika Putri, A., Reswita, & Nurhayatun Nufus. (2022). Pengaruh Permainan Bisik Berantai terhadap Kemampuan Berkomunikasi Secara Lisan Anak Usia 5-6 Tahun. PAUD Lectura: Jurnal Pendidikan Anak Usia Dini, 5(02), 112–117. https://doi.org/10.31849/paud-lectura.v5i02.9590.
- Budiono, H., & Abdurrohim, M. (2020). Peran Guru Dalam Mengembangkan Keterampilan Komunikasi (Communication) Siswa Kelas V Sekolah Dasar Negeri Teratai. Jurnal IKA: Ikatan Alumni PGSD UNARS, Vol.8 No.1.
- Farhrohman, O. (2017). Implementasi Pembelajaran Bahasa Indonesia di SD/MI. Jurnal Keilmuan Dan Kependidikan Dasar, 9(1), 23–34.
- Hasanah, U. Nisa, K. & Jaelani, A.K. (2022) Analisis Kesesuaian Standar Isi Buku Teks Tematik Kelas III Tema 2 Seri Hots Kurikulum 2013, dari http://www.jipp.unram.ac.id/index.php/j ipp/article/view/431
- Herlina, A., & Hadiyanti, D. (2021). Pengembangan Modul Pembelajaran IPA Digital Berbasis Flipbook Untuk Pembelajaran Daring di Sekolah Dasar. Jurnal Elementaria Edukasia, 4(2), 284–291. https://doi.org/10.31949/jee.v4i1.3344
- Husna, A. R. (2020) Analisis Keterampilan Berbicara Siswa Kelas IV SDN 1 Sripendowo Ketapang Lampung Selatan Dalam Pembelajaran Tematik. Fakultas Ilmu Tarbiyah dan Keguruan UIN Syarif Hidayatullah Jakarta.
- Ikhwani, R. Witono, AH. & Jaelani, AK. (2022) Motivasi Berprestasi (Achievement motivation) Guru Dalam Melaksanakan Pembelajaran Pada Masa Pandemi Covid-19 dari https://www.jppipa.unram.ac.id/index.p hp/jcar/article/view/1387
- Izati, S. N., Wahyudi, & Sugiyarti, M. (2018). Project Based Learning Berbasis Literasi untuk Meningkatkan Hasil Belajar Tematik. Jurnal Pendidikan: Teori, Penelitian, Dan Pengembangan, 3(9), 1122—1127-1127. http://jo urnal.um.ac.id/index.php/ jptpp/article/view/11508.
- Makki, Muhammad, Sudirman, Tahir, Muhammad, & Jaelani, Abdul Kadir, (2021), Kinerja Manajerial Kepala Sekolah Dasar di Kota Mataram, dari DOI: https://doi.org/10.29303/jipp.v6i3.294
- Miranti, A. A., Harjono, A., & Jaelani, A.K. (2020). Pengaruh Model Pembelajaran Kooperatif Berbantuan Scramble Terhadap Hasil Belajar Tema 1 Alat Gerak

Hewan dan Manusia Kelas V Gugus 5 Kecamatan Selaparang Tahun Ajaran 2019/2020. http://prospek.unram.ac.id/index.php/PR OSPEK/article/view/7

- Nabila, P. C., Wirnita E., (2021). Pengembangan Modul Pembelajaran Bahasa Indonesia Berbasis Saintifik Pada Materi Iklan Untuk Siswa Kelas V Sdn 20 Talawi Kecamatan Koto XI Tarusan Kabupaten Pesisir Selatan. Jurnal Cerdas Proklamator. Vol. 9, No. 1
- Naway, F.A. (2017). Komunikasi dan Organisasi Pendidikan. Gorontalo: Ideas Publishing.
- Niswara, R., Muhajir, M., & Untari, M. F. A. (2019). Pengaruh model project based learning terhadap high order thinking skill. Mimbar PGSD Undiksha, 7(2), 85–90.
- Nofrion (2018). Komunikasi Pendidikan Penerapan Teori dan Konsep Komunikasi Dalam Pembelajaran. Jakarta : Prenadamedia Group.
- Prasetyoningsih, L.S.A., Arief, N.F., & Muttaqin, K. (2021). Keterampilan Berbicara Tinjauan Deskriptif dan Penerapannya dalam Pembelajaran Bahasa Indonesia.
  Malang : Literasi Nusantara. Diakses pada tanggal 13 April 2022 melalui: KETERAMPILAN BERBICARA Tinjauan Deskriptif dan Penerapannya dalam Pembelaja...- Google Books.
- Putu, yulia. (2019). Hubungan Gaya Komunikasi Guru Terhadap Tingkat Keefektifan Proses Pembelajaran. Jurnal Agama Dan Budaya, http://jurnal.stahnmpukuturan.ac.id/index.php/Purwadita.
- Rombean, C., Rahmadi, P., & Appulembang, O. D. (2021). Pentingnya Penyampaian Informasi Yang Tepat Untuk Membangun Komunikasi Efektif Kepada Siswa Kelas lii Sekolah Dasar [the Importance of Delivering Information Appropriately in Building Effective Communication To Grade 3 of Primary Students]. JOHME: Journal of Holistic Mathematics. https://doi.org/10.19166/johme.v5i1.2055.
- Safitri, E. M., Maulidina, I. F., Zuniari, N. I., Amaliyah, T., Wildan, S., & Supeno. (2022). Keterampilan Komunikasi Siswa Sekolah Dasar dalam Pembelajaran IPA Berbasis Laboratorium Alam tentang Biopori Erica. Jurnal Basicedu, 6(2), 2495– 2504. https://doi.org/10.31004/basicedu.v5i4.1230.
- Salamah, E. R. (2022). NTINGNYA INTERAKSI GURU DAN SISWA DALAM PEMBELAJARAN JARAK JAUH. Proceedings, 1, 73–83.
- Sugiyono (2015). Metode Penelitian Pendidikan Pendekatan Kuantitatif, Kualitatif, dan R & D. Bandung: Alfabeta
- Susanti, R. (2017). Pengembangan Modul Pembelajaran Pai Berbasis Kurikulum 2013 di Kelas V SD Negeri 21 Batubasa, Tanah Datar. JMKSP Jurnal Manajemen, Kepemimpinan, dan Supervisi Pendidikan, 2(2), 156-172
- Wahyuningsih, S. Karma, I.N, & Jaelani, A.K. (2022), Pengaruh Komunikasi antara Guru dengan Siswa terhadap Hasil Belajar IPS Kelas IV SDN Gugus III Sekarbela Kota Mataram, dari https://jipp.unram.ac.id/index.php/jipp/is sue/view/23
- Wilhalminah, A, et al. (2017). Pengaruh Keterampilan Komunikasi Terhadap Perkembangan Moral Siswa Pada Mata Pelajaran Biologi Kelas XI IPA SMA Muhammadiyah Limbung. Jurnal Biotek. 5(2): 37-52.
- Yulianto, H., & Suprihatiningsih, S. (2019). Kemampuan Komunikasi Matematis Siswa pada Pembelajaran Treffinger Berdasarkan Self Efficacy. Prosiding Seminar. 2017,

https://proceeding.unnes.ac.id/index.php/snpasca/article/view/307%0Ahttps://proceeding.unnes.ac.id/index.php/snpasca/article/download/307/339.