



Study Skills Intervention to Address Underachievement in Rural Elementary School in Maros, Indonesia

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Author's contribution

The sole author designed, analyzed, interpreted and prepared the manuscript.

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ABSTRACT

This research aims to identify the effectiveness of study and learning skill training to increase student comprehension, as interventions for underachievement. The study was conducted at Imam Nawawi Elementary School, in Maros, Indonesia, on 24 May - 24 July 2023, using a before-after experimental study design with additional qualitative information analysis. Five fourth-grade students identified as underachievers from a series of assessments were given intervention in the form of reading, listening and note-taking skills training, with the assumption that if students' ability to grasp lesson material increases with the intervention, it will consequently increase achievement. The intervention was carried out in thirteen group sessions. Intervention effectiveness was evaluated using quantitative data from the pre-test and post-test scores as well as qualitative data from interviews with each participant. The results indicate that this intervention has not been completely effective in improving student comprehension, which was assumed to be the stepping stone toward increasing achievement. The gap between students' understanding of the content and several aspects of the delivery of the material is assumed to be the main obstacles to effective intervention. Further elaborations are discussed.

Keywords: *Elementary school student; learning skills; rural; reciprocal teaching; study skills; underachievement.*

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1. INTRODUCTION

1.1 Background

Quality education is an important foundation for individual and societal development [1]. Unfortunately, in reality, there are still many challenges faced in efforts to increase educational attainment that is satisfactory and equitable for all levels of society in Indonesia. Based on analysis of PISA 2015 data, PISA scores in Indonesia from families with high economic levels and in rural areas are lower than those from families with high economic levels and from urban areas [2]. Although the newest data from PISA 2022 showed that the achievement gap between Indonesian students from advantaged socioeconomic levels versus those from the more disadvantaged ones has been narrowing in the last few years, there is still a 34-point gap in achievement scores between the two groups [3]. In an individual context, a discrepancy experienced by students between actual performance and their potential abilities, or in other words, when an individual's estimated potential is not reflected in their actual achievement, is called underachievement [4]. The issue of underachievement is crucial to be addressed; considering that a person's inability to learn optimally can have a negative impact on themselves and their environment—from personal, well-being, even economic aspects—in the future [1,5].

2. LITERATURE REVIEW

As mentioned above, underachievement is understood as a discrepancy between students' actual performance and their potential abilities, or in other words, when an individual's estimated potential is not reflected in their actual academic achievement [4]. To identify an underachiever, it was reported that in literature there were several ways that researchers used to do so: (1) comparing the result of intelligence test as a measure of potential ability with actual achievement in the form of GPA, standardized test, course grades, course-based examinations, or reading achievement score; or (2) report or nomination by teacher, counsellor, or caregiver which students were considered to be underachiever [5].

It is argued that underachievement could be caused by many factors, ranging from individual factors such as level of intelligence and motivation; family factors such as parents'

educational and socio-economic levels; social factors such as race, gender, and living environment; as well as school characteristics [6]. Meanwhile, another alternative explanation states that underachievement which occurs in students may be caused by at least one of four things: (1) the possibility of physical/cognitive/emotional issues experienced by children, for example, learning difficulties; (2) mismatch between students and their school environment; (3) students' attitudes and perceptions towards themselves and the learning process at school; or (4) the lack of self-regulation and study skills possessed by these students [7].

Various interventions have been attempted to address this problem, although each usually was rarely replicated and has been studied only by a few researchers [5]. Among them are literacy development [8], instructional interventions [9], and academic skill development [5]. These interventions, although proposed by different experts, basically have a similar underlying principle; namely, developing children's capacity to be able to learn, train, and apply learning strategies so that they can more optimally take in information they find and convey the ideas they have, as well as understand, store, and analyze the information obtained to then respond appropriately [8,9]. The hypothesis is that when students have the skills to receive, understand, store, analyze and convey information well; their learning process will also be more optimal, consequently increasing their learning achievement.

2.1 Case Sample

One example of underachievement in Indonesia was found at Imam Nawawi Maros Elementary School, South Sulawesi. Teachers reported that their students are often unable to get satisfactory grades in final assessments, even though they were previously perceived as being able to get better results than that. The teachers argued that this was evident from the higher daily assignment scores that usually could reach at least the school's minimum passing score, but the finals were often below the minimum passing score.

Due to limited resources, only fourth-grade students—the oldest student group in the school, as there weren't yet fifth and sixth graders—were selected for further assessment. This selection is based on the consideration that since they were the oldest, these students have the highest

urgency to be given treatment, should underachievement be truly an issue for them. This is due to the fact that underachievement intervention is best given at the very latest in middle school to be effective [5]. From the results of the assessment, eight students were identified as experienced underachievement, who were then given learning skills intervention—including reading/literacy skills as well as listening and note-taking—in order to maximize the learning process and improve academic achievement.

2.2 Research Objective

This study aims to investigate the effectiveness of study skills intervention to maximize students' ability to grasp lesson material, in order to increase academic achievement.

3. METHODOLOGY

3.1 Design

This study was conducted with a before-after experimental design, with additional qualitative analysis from interview insights.

3.2 Participants

Initially, an initial assessment was carried out on all fourth-grade students ($n = 14$) to identify students who experienced underachievement. From the assessment, eight students were identified who were then eligible to take part in the intervention series, but in the end, only five were able to take part in the full intervention series.

3.3 Procedures

Stage 1: At first, the researcher received complaints from Imam Nawawi Elementary School teachers stating that students' final assessment scores were low, even though based on observation during their daily learning process, higher scores were expected. A series of assessments were then conducted on the fourth-grade students ($n = 14$), as the oldest student group in school. The assessment methods included classroom observations to get a closer look at teaching and learning processes, several interviews with teachers and

students, administration of intelligence tests and reading comprehension tests, as well as analysis of students' learning scores from the latest final assessment (end of semester exam).

From these assessments, the researcher then identified which students were underachievers; i.e. the ones who have high or at least adequate potential but unable to attain equivalent achievement. From the original fourteen students who took part in the assessments, eight were identified as underachievers and, therefore eligible for intervention. The results of the assessments were in line with the proposed intervention model since a lack of study skills and literacy skills were evident.

Stage 2: The pre-test—in the form of a reading comprehension test—was given to the eight students eligible for intervention.

Stage 3: Intervention sessions were conducted with the author herself as facilitator. Initially, 11 intervention sessions were designed to focus on reading skill training, using reciprocal teaching techniques adapted from similar training that has been conducted before [10]. However, as the session progressed, it became apparent that students still did not have the basics of proper listening and note-taking. The researcher then held two additional sessions to discuss listening and note-taking skills by adapting techniques from the existing Study Skills Training Module [11].

Intervention sessions were designed in such a way as to provide opportunities for students to understand the purpose and urgency of activities, and get to know and practice various techniques in reading, listening and taking notes. Apart from that, in each session, there were also repetition and bridging of previous material along with its application in other contexts in order to further increase students' understanding and generalization of the material presented. More details of the adaptation training design from [10] and [11] used in this research can be seen in Table 1.

Stage 4: The post-test was carried out in the form of a reading comprehension test.

Table 1. Intervention program design

Session	Objective	Activity
1	a Understand the objectives of the study sessions.	Students are asked to write their ideal learning attitude on a Post-it and stick it on the whiteboard, then discuss the finding with the facilitator to determine what is its relevance to the objective of these study sessions.
	b Understand the rules during study sessions.	Students write down the study session objectives as well as do(s) and don't(s) on a blank piece of paper (i.e. learning contract), then sign it.
2	a Obtain students' current reading comprehension level.	Students take a pre-test.
	b Determine the students' reading interests.	Practice and discuss things that come to mind when reading.
3	a Recall the learning contract and learning objectives.	Review the contract and learning objectives.
	b Learn how the brain works as an initial basis for studying cognitive and metacognitive strategies for learning.	Discussion of the learning process and what is known about the role of the brain when learning.
4	a Recall previous material.	Review the material studied in the previous session.
	b Students know four metacognitive strategies for reading in general and practice these techniques.	Introducing the reciprocal approach technique using analogies: The Forecaster (predicting technique), The Boss (explaining main idea technique), The Detective (clarifying/looking for information technique), and The Journalist (asking questions technique).
5	a Recall the learning contract that has been agreed upon.	Review the contract and learning objectives.
	b Practice predicting reading techniques.	Students discuss in pairs to predict the storyline of the given folk tale.
6	a Practice finding the text main ideas.	Students discuss in pairs to find the main idea of each paragraph in the folklore given.
	b Practice clarifying information they find in the text.	Students work in pairs to mark parts they do not understand from the given folk tale.
7	Recall the reading techniques that were previously discussed.	Discuss and repeat the techniques that have been practised.
8	a Recall materials learned at the previous sessions.	Discussion, directive questions.
	b Practice the questioning ideas technique.	The facilitator models how to generate questions from answers that are already known.
	c Summarize and retell the folklore obtained in the previous session.	Retell folk tales in front of the class in turn.

Session	Objective	Activity
9	Review reading skills materials that have been discussed.	Semi-free drawing and free coloring, as a medium for students to review the material that has been discussed.
10	Practice the material that has been discussed in other contexts (lesson questions).	The facilitator guides students to apply the techniques that have been discussed when facing difficult questions.
11*	a The facilitator bridges previous material (how to learn: reading) with the next material (how to learn: listening).	Review material about the brain and what activities are carried out when studying.
	b Understand how to listen to learn (listening to learn).	Reading a short story, students answer the examiner's questions spontaneously.
12*	a The facilitator bridges the previous material (how to learn: reading) with the next material (how to learn: listening).	Review material about the brain and what activities are carried out when studying.
	b Students discussed how to take notes effectively in learning.	Discussion, short lecture.
13*	Students recalled material about how to study effectively, when reading, listening or taking notes.	Make media in groups according to their respective topics: reading/listening/noting effectively.

**) additional intervention design, after the series of interventions begins and the examiner finds the need for listening and note-taking skills intervention*

3.4 Inclusion Criteria

Of the 14 students who were assessed, those who were to be included in intervention and further evaluation must meet the following criteria.

- Has intellectual score categorized as average (minimum);
- Obtains final exam results below minimum passing score;
- Obtain an average reading comprehension test score below the school's minimum passing score.
- Attend the intervention from start to finish without being absent.

3.5 Measures

Raven's Colored Progressive Matrices (CPM) were utilized to gather data on students' intellectual potential. CPM is an intelligence assessment tool which the author has received the proper training to administer and interpret. This tool has been widely intended for young children aged 5-11 years old and used to assess fluid intelligence [12]. It has been used and normed in 35 countries, and is famous as it is fairly easy to use, as well as its notable culture-fair and mostly non-verbal characteristic [12].

Next, reading comprehension was chosen as a method of evaluation considering the fact that it has been found to be a stepping stone prior to more complex cognitive activities such as comparing ideas or drawing inferences [13]. Hence, it is no wonder that comprehension is considered very crucial as one of the basic skills for success in school, and even for daily life in general [13]. Both the assessment and pretest/post-test utilized texts with their respective questions taken from fourth-grade textbooks with the same curriculum used in Imam Nawawi Elementary School. Specifically in the initial assessment, two types of text were used: narrative text representing a reading task with a lower level of difficulty, and expository text as a reading task with a higher level of difficulty.

4. RESULTS

4.1 Pre-Intervention Analysis

As has been explained above, initially a series of assessments were carried out on all fourth-grade students, including observation, interviews, intelligence and reading ability tests, as well as analyzing learning outcomes. Based on the intelligence test, out of 14 students, 10 students scored in the average category, one below

average, one defective, and the other two above average. Meanwhile, from their learning results, 11 students obtained an average below passing score, and three others above the passing score. Finally, not a single student obtained an average reading ability score above the passing score; However, there were three students who obtained reading comprehension scores for exposition texts above the passing score. Therefore, eight students fulfilled the aforementioned inclusion criteria. For a clearer picture, the above result of the assessment is shown in Table 2.

Apart from that, a summary of the rest of the assessment results from observations and interviews can be seen in Fig. 1.

4.2 Post-Intervention Analysis

After the eligible students had been identified, the interventions were then commenced according to the aforementioned intervention plan (Table 1). The effectiveness of the intervention was then evaluated by reviewing three indicators initially determined by the authors; which can be seen in Table 3.

Data for evaluation was collected through two methods: quantitatively for the first indicator by comparing the pretest and post-test scores, and qualitatively for the second and third indicators by interviewing the students individually after the

intervention was completed. Unfortunately, of the eight students identified as underachievers and therefore eligible to take part in the intervention, only five were able to fully attend all sessions of the intervention. Of these five students, three gained an increase in pretest-posttest results, one decreased, while one remained the same (as recorded in Table 4). Therefore, the first objective is considered achieved.

For the second and third objectives, a qualitative individual interview carried out approximately two weeks after the last session of intervention, showed that the intervention was successful in providing insight to students about the importance of learning skills, or in their words: to "make me smarter". Therefore, the second objective is considered achieved. However, it should be noted that when students were asked to elaborate on how exactly the materials make them smarter, they were unable to answer in detail.

Regarding the third objective, the minimum expectations were that students be able to mention three main points of interventions, namely (1) how to read, (2) how to listen, and (3) how to take notes. Unfortunately, most students only managed to mention one of these material points. Other than that, the students did mention elements of information the facilitator conveyed during the intervention; however, those tended to

Table 2. Eligibility for intervention inclusion

No	Students	Age	IQ	Final Exam	Reading Comprehension	Eligibility
1	A1	11	Defect	Fail	Fail	X
2	A2	10	Average	Fail	Fail	X
3	A3	10	Average	Fail	Fail	✓
4	F1	10	Above average	Pass	Fail	X
5	F2	10	Average	Fail	Fail	✓
6	F3	11	Below average	Fail	Fail	X
7	F4	10	Above average	Pass	Fail	X
8	I	10	Average	Fail	Fail	✓
9	M1	11	Average	Pass	Fail	X
10	M2	10	Above average	Fail	Fail	✓
11	R	10	Average	Fail	Fail	✓
12	U	10	Average	Fail	Fail	✓
13	Y1	11	Average	Fail	Fail	✓
14	Y2	10	Average	Fail	Fail	✓

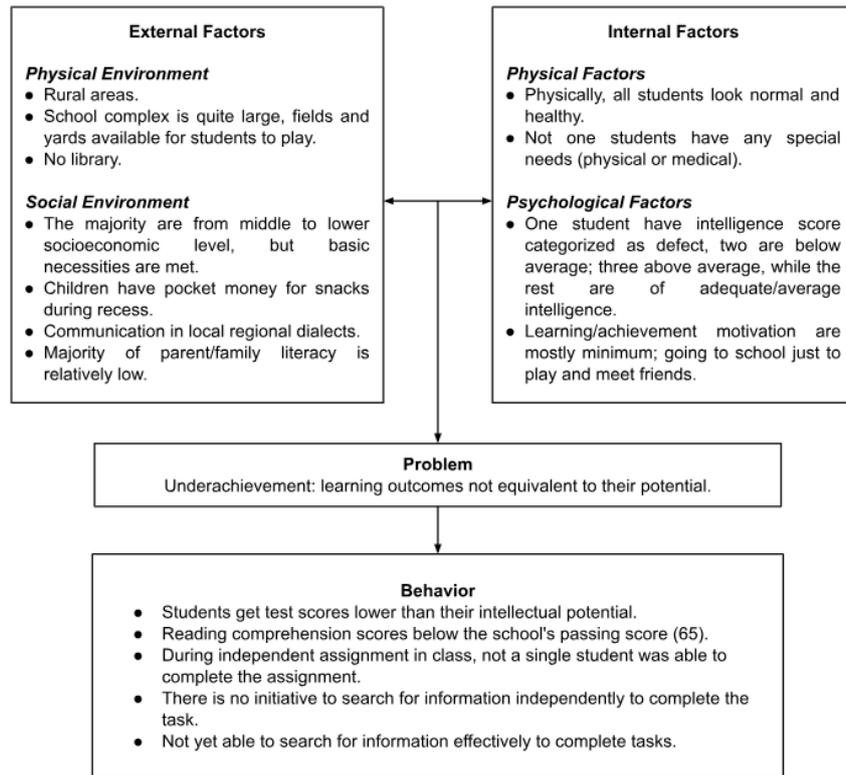


Fig. 1. Summary of assessment results

Obtained from observation, interviews, psychological tests, reading comprehension test

Table 3. Achievement of overall success indicators

No	Objective	Achieved/Not
1	There was an increase in pre-test and post-test reading ability scores, where the participants' post-test scores were higher than the pre-test.	√
2	Students feel the benefits obtained from participating in group intervention.	√
3	Students can remember and briefly explain the material learned in group intervention.	x
Number of Indicators		3
Number of Indicators Reached		2
Number of Indicators Not Reached		1
Percentage of Achievement		67.7%

Table 4. Pre-test & post-test scores

No	Students	Pre-test	Post-test
1	F2	6.67	6.67
2	M2	53.33	66.67
3	R	26.67	33.33
4	U	6.67	13.33
5	Y2	20.00	13.33

Note: Range of score 1-100

be random and not well organized. Moreover, the material mentioned is not the core material of the intervention, and was only excerpts of an

incomplete part of the material; for example: about the brain, work, one of the analogies used to describe the skills taught, guessing the

content, looking for the main idea, and so on. What these students remembered was not wrong, per se, but these indicated that the information they captured was not well organized in their minds. In other words, the students did not really fully grasp the full picture of what the facilitator conveyed during group intervention. This lack of complete understanding will certainly hinder the application of the material provided to real-life contexts outside the intervention session. Therefore, the third objective is considered not achieved.

In addition, the qualitative evaluation data is also obtained from observations of 24 objectives for each session (Table 5). Of the 24 objectives and their respective indicators, 17 of them were

achieved. This means that around 70.8% of the indicators were successfully achieved in this intervention, while the remaining seven were not achieved properly.

5. DISCUSSION

If we consider the Knowledge Dimension of Bloom's Taxonomy [14], the Factual aspect is the first step before one can move through the continuum, that is, the Conceptual, Procedural, and Metacognitive aspects [14]. Previous study has found that teaching students according to this order is paramount for increasing learning outcomes [15]. Hence, it would be far-fetched to expect the students to be able to apply the skills that were taught during the intervention

Table 5. Evaluation of session objectives

Session	Objectives	Achieved/Not
1	a Understand the objectives of the study sessions.	√
	b Understand the rules during study sessions.	√
2	a Obtain students' current reading comprehension level.	√
	b Determine the students' reading interests.	√
3	a Recall the learning contract and learning objectives.	√
	b Learn how the brain works as an initial basis for studying cognitive and metacognitive strategies for learning.	√
4	a Recall previous material.	x
	b Students know four metacognitive strategies for reading in general and practice these techniques.	x
5	a Recall the learning contract that has been agreed upon.	√
	b Practice predicting reading techniques.	√
6	a Practice finding the text main ideas.	√
	b Practice clarifying information they find in the text.	√
7	Recall the reading techniques that were previously discussed.	√
8	a Recall materials learned at the previous sessions.	√
	b Practice the questioning ideas technique.	x
	c Summarize and retell the folklore obtained in the previous session.	x
9	Review reading skills materials that have been discussed.	x
10	Practice the material that has been discussed in other contexts (lesson questions).	x
11	a The facilitator bridges previous material (how to learn: reading) with the next material (how to learn: listening).	√
	b Understand how to listen to learn (listening to learn).	√
12	a The facilitator bridges the previous material (how to learn: reading) with the next material (how to learn: listening).	√
	b Students discussed how to take notes effectively in learning.	√
13	Students recalled material about how to study effectively, when reading, listening or taking notes.	√
Total Objectives		24
Total Objectives Successfully Achieved		17
Total Objectives Not Achieved		7
Success Percentage		70.8%

(Procedural aspect) if they could not even fully master the Factual basis beforehand. In other words, the intervention would have been considered fully effective if the students were able to fully grasp the information learned during the intervention so that they could more readily apply it in everyday life. Unfortunately, as explained above, the result of the evaluation showed that this was not the case.

There are several aspects that are likely to influence this [16]: (1) finding the right root of the problem, either lacking skills or lacking motivation; (2) identifying student learning levels; (3) adapting instruction to students' comprehension abilities; (4) using evidence-based interventions; (5) involving active responses from students to ensure understanding; (6) provide an explicit explanation; (7) increase reviews; (8) provide students with the opportunity to have a hand in choosing the learning structure; (9) monitor progress regularly; (10) implementing large-scale interventions for the same problem for several students; (11) created a special intervention team.

Judging from the aforementioned eleven points, there are several points that may be relevant to the intervention in this study and have not been fulfilled, thereby hindering the expected effectiveness of this intervention. Firstly, the first point. The root of the problem seems to be not only lack of ability as the author originally assumed, but also students' low motivation for achievement and learning. As a consequence of this, students most likely only participate in activities (including the study sessions during intervention) as part of their routine that they have to follow, not something for their own good. This was gleaned from individual sessions with each participant, where the students admitted they did not care about their learning outcomes at school. This lack of perceived value for education has been found as one of several motivational aspects that may affect the developmental pathway of an underachiever [17]. Thus, strengthening motivation was not wholly addressed since the focus was teaching students learning skills, hence there will need to be a longer intervention to address this issue.

Furthermore, the third point might hold merit and relevance as well to this case. There is a cultural gap between the students who live in rural areas and the facilitator who originated from a more

urban city. This might also make it difficult for participants to understand the material presented, especially if the method of communication is not appropriate to the student's cultural background. Not to mention, the skills taught during interventions could be categorized as Procedural and Metacognitive types of Knowledge according to Bloom's Taxonomy [14]. This most likely requires emphasis on the previous stages in the continuum (Factual and Conceptual), which have been done during the intervention. Yet, if the communication and cultural gap were not adequately bridged, students would have had difficulties even comprehending the Factual and Conceptual aspects of materials given during sessions, let alone actually knowing which and when a particular technique or method needs to be used [14]. Even though the authors have tried to bridge the material to students' understanding, as well as speak as close to the local dialect as possible, it is possible that more scaffolding is still needed to convey material that is quite advanced in nature and therefore could be somewhat foreign and considered difficult for the students.

6. CONCLUSION

It was found that the study skills intervention focusing on reading, listening, and note-taking skills carried out in thirteen group sessions was not effective enough to become an initial stepping stone for students at Imam Nawawi Maros Elementary School to address the issue of underachievement they experienced. Evaluation of the intervention showed that participants still had difficulty grasping the material in its entirety, assumed to be caused by a combination of lack of motivation to learn and achieve, as well as a bigger gap of understanding and communication than previously expected between the facilitator and the students. Since the understanding of the material is not yet adequate, it is assumed that the students will still have difficulty applying the learning skills taught to improve their learning outcomes.

Practical recommendations are suggested primarily to students and teachers with the aim of improving understanding and application of the material. For the participants, it is hoped that posting the results of the social media intervention in class will make it easier for them to recall the material presented, and prompt them to at least remember and apply what has been studied. For teachers, it is recommended to use

effective and evidence-based instruction methods to facilitate student learning, as well as collaborate with school stakeholders to create an atmosphere in which students can cultivate their motivation for achievement and interest in learning for their own good. Recommendations for further studies include 1) simplifying the learning skills material taught, 2) providing instruction training to teachers instead of intervening directly to the students, and 3) conducting school-based interventions to find the root of the problem and more comprehensive solutions to address the underachievement issue in rural schools.

CONSENT

This research has obtained approval from the school, including coordination with the parents/guardians of the students involved. This approval includes the student's participation in observation sessions, interviews, psychological tests, interventions, and the publication of this paper. All data collected is taken with student privacy and well-being in mind.

ETHICAL APPROVAL

This study was conducted while fully observing the Code of Ethics of Psychology in Indonesia.

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COMPETING INTERESTS

Author has declared that no competing interests exist.

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