# Exploring Listening Relationship Pattern of Information Approval Process in Science Learning: A Qualitative Investigation Using TBLA (Transcript Based Lesson Analysis)

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**Abstract:** This study reveals listening relationship patterns in the information approval process used to improve the quality of learning dialogue, especially in science learning. A qualitative method with a case study approach was used to analyze listening relationship patterns in science learning during one semester. A total of 3 science teachers, 31 students, and two academics involved in lesson study for learning communities were selected to capture a mutual listening relationship pattern in receiving information with a natural performance and not tense when observing. Observation, documentation, and clinical interviews were used as data collection techniques. Video and audio recorders were involved as documentation tools for this study. Transcript-based lesson analysis (TBLA) was included in conducting data analysis. The listening relationship patterns analysis results in classical discussion sessions in cycles 1–3, which tend to have semi-equal listening relationship patterns. Meanwhile, the listening relationship pattern in group discussion sessions in cycles 1 to 3 tends to be the isolated listening relationship group pattern. The shift in the pattern of listening relationships in group discussion sessions is caused by several factors, including student collaboration awareness, heterogeneous composition of students, tasks, and questions that challenge students, and appropriate interruptions of teacher direction. The research results provide a reference for reflection on developing teacher professionalism to improve more effective and meaningful learning.

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## INTRODUCTION

Reforming education patterns, especially within the school unit, is needed to prepare a generation ready to face the challenges of the 21st century (Saastamoinen et al., 2023). In developed countries, education reform has been carried out to become model 21 schools based on the simultaneous achievement of quality and equality principles (Hattie & Timperley, 2007; Sato, 2014). Quality and equality in education are emphasized to encourage every individual to become a good generation ready to face the 21st century challenges (Lehesvuori et al., 2011). Success in school reform in developed countries can be seen from the results of the Program for International Student Assessment (PISA) published by the OECD (Organization for Economic Cooperation and Development), which shows that these countries occupy the highest rankings in the world and have achieved a simultaneous balance of quality and equality in learning (Sato, 2012).

Different things happen to Indonesia's PISA achievements from year to year. Based on Indonesia's achievements in ten consecutive years, it ranks among the last ten participating countries (OECD., 2022). It concluded that there still needs to be more quality and equality of learning in Indonesia. Learning quality and equality, formation starts from reforming the pattern of mutual teaching relationships into mutual learning relationships in the learning system (Edwards-Groves & Hoare, 2012; Smart & Marshall, 2013). This relationship depends on the dialogue formed in learning. Learning dialogue is an exchange of ideas

developed in learning (Davies et al., 2017; Mercer & Littleton, 2007). An effective Learning dialogue that creates bonds between students is a dialogue that establishes a communication channel between students and students (listening relationships). Mutual learning relationships occur when the dialogue formed in learning takes the form of an exchange of opinions that occurs in peace; each student listens to what the other students say and then thinks about it in depth (Sato, 2012; Sato, 2014). Effective discourse must be implemented to attain quality and equality, particularly in science education (Bansal, 2018; Chin, 2006; Darling-Hammond et al., 2000; Ingram & Elliott, 2016). However, effective learning dialogue forming expectations, especially in science learning, still needs to align with the field reality.

The study demonstrates that a less effective learning environment results from teachers' ignorance of the dialogue role in learning. Statements and questions given by teachers in learning only give short answers and do not initiate discussions and exploration of students' knowledge (Awinda, 2018; Hajar et al., 2015; Hajar et al., 2016). The dialogue formed between students only expresses their opinions expressively, and there is no relationship between listening to each other. Students only present what they already understand without constructing new knowledge (Hajar & Hendayana, 2019; Jannah, 2018). Several study results have explained that the implementation of science learning dialogue needs to be improved. However, on the contrary, there has not been much research regarding the identification of mutual listening relationships in science learning, so the process of improving the quality of effective learning dialogue itself has yet to be carried out well.

Based on the previous description, it can be concluded that there is a gap between the need to develop successful learning dialogue and the need for recognition of listening relationship patterns. This case provides an opportunity for further research to bridge the gap. Qualitative analysis was carried out to analyze the listening relationship to each other in receiving information as a reference for improving the quality of learning dialogue, especially in science learning. One form of in-depth analysis that examines lesson dialogue is the TBLA technique (Transcript-Based Lesson Analysis) (Arani & Reza, 2017). Data analysis using TBLA is carried out by analyzing learning based on dialogue transcripts formed in learning design activities, observation, reflection, and re-design jointly by the teacher community in LSLC (Lesson Study for Learning Community) activities (Arani & Reza, 2017). This collaborative activity enriches the resulting learning dialogue findings data. This study aims to reveal the form of analysis of patterns of mutual listening relationships in the process of receiving information in science learning using TBLA (Transcript-Based Lesson Analysis). The results of the study of listening relationship patterns in this study can be used as a reference in improving the quality of science learning dialogue in future research.

## METHOD

This study uses qualitative study methods, and the study approach used in this study is a case study approach (Lichtman, 2009). The case study approach in this study looks at one case in an entity, namely the relationship pattern of listening to each other in science learning at one of the Bandung City Middle Schools, which has been involved in lesson study for learning communities (LSLC) for one semester.

Participants in this study were students in 8th grade of a junior high school in Bandung City, totaling 31 students consisting of 15 male students and 16 female students. The junior high school (SMP) in the city of Bandung, which was the target of this study, had more than one semester of lesson study for learning community experience in the science group. The number of science teachers actively involved in the lesson study for the learning community was three female teachers with biology, physics, and chemistry backgrounds, with one of the teachers being a model teacher during the study. The science teachers involved in the LSLC for the science group routinely spend time every Wednesday to discuss, reflect on previous learning, and plan future learning. Apart from the three science teachers who were actively involved in implementing the LSLC, in this study, there was also a lecturer and three science postgraduate students who were actively engaged in planning, observing, and reflecting on the learning that had been carried out based on the LSLC stages. LSLC's experience was the basis for selecting participants in this study. This activity ensures that teachers and students are considered to be able to show natural performance and are not tense when observing. The reasons for this choice will support and

facilitate the data analysis process using transcript-based lesson analysis from this study.

The data collection stage is based on the lesson study activity stage. This study was carried out over 3 lesson study cycles, each consisting of design, observation, reflection, and re-design stages. The choice of the number of cycles intended to be able to see the profile of the pattern of listening relationships in science learning in each cycle.

This study uses data collection techniques through observation documentation and clinical interviews. Documentation is carried out using video and audio recorders. The placement of video and audio recorders at the lesson study observation stage in this study is illustrated by the classroom plan in Figure 1.
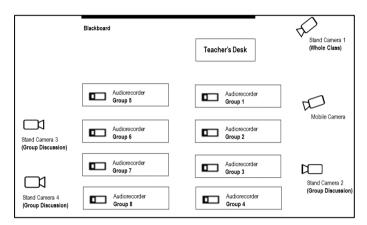


**Figure 1.** *Classroom layout on study documentation context*

The data analysis technique used in this study is transcript-based lesson analysis (TBLA). Transcripts were obtained from videos of design, observation, reflection, and re-design sessions in the lesson study stage. The primary study transcript data is the transcript at the observation stage. The stages of transcript analysis based on transcript-based lesson analysis (TBLA) are as follows: 1) Reading the learning transcript (observation stage transcript as primary data and design and reflection and re-design transcripts as supporting data); 2) Divide the transcript of the observation stage into several segments (locus) based on the learning flow created by the teacher in the learning lesson plan that was created in the previous design stage; 3) Carrying out microanalysis, namely by providing attributes or information on each locus in the form of study er interpretations assisted by supporting data in the form of field notes, lesson artifacts; 4) Carrying out macro analysis in the form of coding the categorization of learning relationship patterns by calculating the waiting time at each locus; and 5) Describe the learning dialogue patterns that have been formed in each observation lesson study cycle.

## RESULT AND DISCUSSION

### Listening Relationship in the Process of Receiving Information

Listening relationships occur between teachers and students or between students themselves. They listen to each other and think deeply about the concepts their teacher or friend conveys. Listening relationships analysis can be measured from the wait time in classical and group discussions (Walsh, 2011). The average wait time for each discourse movement from the classical discussion is shown in the Table 1.

**Table 1.** Average wait time in classical dialogue discussions in learning cycles

| Discourse transfer | wait-time (hh.mm.ss) | | |
|---|---|---|---|
| | **First Cycle** | **Second Cycle** | **Third Cycle** |
| Teacher Initiation-Student Response | 00.00.02 | 00.00.10 | 00.00.11 |
| Student response - Teacher feedback | 00.00.10 | 00.00.06 | 00.00.03 |
| *First feedback - Teacher's follow-up feedback* | 00.00.09 | 00.00.07 | 00.00.13 |

| Discourse transfer | wait-time (hh.mm.ss) | | |
|---|---|---|---|
| | First Cycle | Second Cycle | Third Cycle |
| *Teacher feedback- Student's continued response* | 00.00.04 | 00.00.06 | 00.00.06 |
| Student response - Teacher Initiation | 00.00.17 | 00.00.05 | 00.00.04 |

The shortest wait time it occurred when students listened to the initiation with a two-second duration, as shown on the first cycle. The longest wait time is 17 seconds in cycle 1, formed at the distance of the response and initiation given by the next teacher. This shows that the wait time teachers use to listen to students is more than that used by students to listen to teachers. This can be demonstrated from the snippet of learning dialogue from cycle 1 of the classical discussion session accompanied by the waiting time and responses produced below.

| 00.15.20 | T83 | *What is vibration?* | *I-T* | - |
|---|---|---|---|---|
| 00.15.22 | Nik | *Moving objects vibrate* | *R-S* | *00.00.02* |
| 00.15.29 | T84 | *Objects that vibrate: What is an example of vibration? come on, raise your hands* | *F-T* | *00.00.07* |
| 00.15.31 | May | *touched object* | *R-S* | *00.00.02* |
| 00.15.33 | Nik | *this one* | *R-S* | *00.00.02* |
| 00.15.39 | T85 | *Yes, Arya, pay attention, Arya wants to answer* | *F-T* | *00.00.06* |
| 00.15.48 | Ary | *A movement of an object back and forth or forward* | *R-S* | *00.00.09* |

The dialogue excerpt above shows that the response given by most students on average is less than 2 seconds to produce short answers to the response given by the previous teacher. The second wait time for a response shows that students are listening but not thinking about the answer to the teacher's question using their knowledge construct. Students look for answers from literature and read them back to the teacher. This response proves that some students spend less time listening to the teacher's questions and need help understanding them in depth first.

Analysis of three learning cycles found that the listening relationship pattern tends to be semi-equal, where the teacher tries more to listen to the responses given by students in classical discussions with an average wait time of more than 5 seconds. Students are more likely to choose responses automatically and quickly without thinking deeply about the answer, with an average wait time of less than 5 seconds. The meaning of the word semi-equal in this semi-equal listening relationship pattern shows that the pattern formed is unbalanced, with the teacher listening more to the responses given by students than the students listening and responding to questions presented by the teacher. The imbalance in listening relationships in this pattern is caused by students accustomed to responding quickly to their new knowledge. The classic discussion pattern in cycle one learning dialogue can be depicted with the scheme in Figure 2.
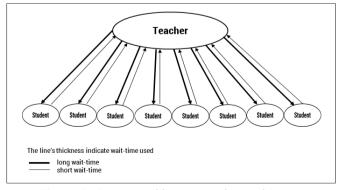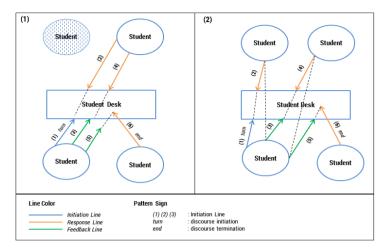


**Figure 2.** *Semi-equal listening relationship pattern*

The listening relationship pattern was also analyzed from the conversation and wait time in the

eight groups formed in the lesson. The results of the transcript analysis showed that the listening relationship patterns were in the form of an isolated listening relationship group pattern or a listening relationship pattern formed in one group, which was formed in group 2 and group 7 discussions.

**Figure 3**.
Passive student's isolated listening relationship group pattern (1) and active student's isolated listening relationship group pattern (2)



The dialogue in group 7 is in accordance with Sato's (2012) explanation that the mutual listening relationship in the group develops from the question "How to do this part?" by students who do not understand. The student responds to and explains the question until the student who asks the question understands. In the end, students who need help understanding can understand the concept of the material independently. Sato, (2012) also explains that a mutual listening relationship means forming a reciprocal learning relationship, not a joint teaching relationship. Mutual learning relationships are created from exchanging opinions in peace; each student listens to what his friend says and then thinks about it deeply. The isolated listening relationship group pattern was formed in groups 2 and 7 in group discussion sessions in each cycle.

In groups 1, 3, 5, 6, and 8, the relationship pattern formed was not a relationship of mutual listening but a relationship of joint discussion. The following is a snippet of the dialogue initiated in the group 5 discussion session, illustrating the mutual discussion relationship.

| 00.43.42 | syakira | Does the longer it get affected by vibration? | I-S | - |
| 00.43.48 | putri | Doesn't it? How is this? | R-S | 00.00.06 |
| 00.43.51 | syakira | the 15 cm one is bigger than | F-S | 00.00.03 |
| 00.43.55 | putri | the 25 cm one | R-S | 00.00.04 |
| 00.44.01 | syakira | Yes, length affects to the pressure (not vibration) | F-S | 00.00.06 |
| 00.44.03 | arya | that is just vibration | R-S | 00.00.02 |

In the dialogue excerpt above, it can be seen that there was an active exchange of opinions, starting with one student giving his argument in the group. Then, another member of the group gave a response. This dialogue ends with a conclusion drawn by one member of one group based on the discussion that has been held. This dialogue has a mutual teaching relationship: students who feel they have an idea or concept convey the idea, and students who do not need to teach the concept. This creates an active exchange of ideas without any mutual learning relationship (Kawalkar & Vijapurkar, 2013; Pehmer et al., 2015). Students only represent what they already understand. This relationship is referred to by Sato (2012) as a relationship of mutual discussion or not a relationship of listening to each other. The pattern of joint discussion relationships in an isolated group dialogue pattern can be called an isolated non-listening relationship pattern.

**Influence Factors on Shifting Listening Relationships**
Based on the analysis that has been carried out previously, several things influence the shift in the

pattern from a mutual discussion relationship to a mutual listening relationship in the learning dialogue of classical discussion sessions. Based on the results of the qualitative analysis, it is known that one of the factors that influences the mutual listening relationship is the composition and awareness of members in the group. Mutual listening or mutual learning relationships tend to be initiated by one of the students with a low level of cognitive ability, which is responded to by students with a higher level of cognitive ability. There is a mutual learning relationship between students with different cognitive levels. Mutual learning relationships are formed from the exchange of opinions in silence, and each student listens to what his friend says or says and then thinks about it in depth (Reinsvold & Cochran, 2012; Martin & Clerc-Georgy, 2015). This is different from groups consisting of members with the same level of cognitive ability (homogeneous). Groups composed of homogeneous students prefer to form mutual discussion relationships. The exchange of opinions occurs actively between students in groups and ends with agreeing students in groups. Therefore, the placement of students based on their level of cognitive ability tends to influence the formation of listening relationship patterns in group discussion sessions.

Another factor that influences the formation of mutual listening relationships in group discussion sessions is the tasks and questions given by the teacher. Sharing and jumping tasks challenging students in learning dialogue affect mutual listening relationships. Sharing tasks are shared material that all students must understand while jumping tasks are jumping material that makes students think more critically (Sato, 2012). The teacher's use of higher-level questions in initiating and providing feedback will influence the formation of learning dialogue in mutual listening relationships. Challenging questions will make students more inclined to learn from each other in groups.

Based on these results, improving the quality of listening relationship patterns can be done by changing the composition of group members, the tasks and questions used, and appropriate interruptions and teacher direction. This study, however, has potential limitations. Limitations in this research include the number of participants. A more significant number of participants has the potential to enrich findings on patterns of mutual listening relationships that contribute to improving the quality of learning dialogue. This is an essential consideration in future research.

## CONCLUSION

The mutual listening relationship pattern that dominates the classical discussion sessions in cycles 1 to 3 tends towards a pattern of semi-equal listening relationships. Meanwhile, the pattern of mutual listening relationships that dominates group discussion sessions in cycles 1 to 3 tends towards the pattern of isolated listening group relationships. The shift in the pattern of listening relationships in group discussion sessions is caused by several factors: awareness of group members and the heterogeneous composition of group members, tasks and questions that challenge students, appropriate interruptions, and teacher direction. The various findings in this research illustrate how the pattern of mutual listening relationships occurs when receiving information in science learning. This is a meaningful understanding and reference for improving the quality of science learning dialogue in future research.

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