

Application of Direct Instruction Model for Improving Learning Outcomes Biotechnology

Hisbulloh Huda ¹⁾

¹ Madrasah Tsanawiyah Negeri 4 Jombang , East Java Indonesia

Email: hisbullohh@gmail.com ¹

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Abstract: *This study aims to analyze the effectiveness of implementing the Direct Instruction model in improving student learning outcomes on the topic of Biotechnology among grade IX B students at MTsN 4 Jombang in the 2025 academic year. The research employed a Classroom Action Research (CAR) design conducted through two learning cycles. Each cycle consists of four stages: planning, acting, observing, and reflecting. The participants were 30 male students. Data were collected through observation and achievement tests administered at each cycle. The findings revealed that the average student score increased from 69.71 in Cycle I to 87.43 in Cycle II, with the percentage of mastery learning increasing from 69.71% to 81.88%. This improvement indicates that the Direct Instruction model effectively enhanced the quality of learning, particularly in strengthening students' conceptual understanding of biotechnology. These results affirm that systematic and consistent application of Direct Instruction can serve as an effective pedagogical alternative for teachers seeking to optimize science learning outcomes at the junior high school level.*

Abstract : *Penelitian ini bertujuan untuk menganalisis efektivitas penerapan model Direct Instruction dalam meningkatkan hasil belajar siswa pada materi Bioteknologi di kelas IX B MTsN 4 Jombang tahun pelajaran 2025. Jenis penelitian yang digunakan adalah penelitian tindakan kelas (Classroom Action Research) yang dilaksanakan melalui dua siklus pembelajaran. Setiap siklus terdiri atas empat tahap, yaitu perencanaan (planning), pelaksanaan (acting), pengamatan (observing), dan refleksi (reflecting). Subjek penelitian berjumlah 30 siswa laki-laki. Data diperoleh melalui observasi dan tes hasil belajar pada setiap siklus. Hasil penelitian menunjukkan bahwa rata-rata nilai siswa meningkat dari 69,71 pada siklus I menjadi 87,43 pada siklus II, dengan persentase ketuntasan belajar meningkat dari 69,71% menjadi 81,88%. Peningkatan tersebut mengindikasikan bahwa model Direct Instruction mampu memperbaiki kualitas pembelajaran, terutama dalam meningkatkan pemahaman konseptual siswa terhadap materi Bioteknologi. Temuan ini menegaskan bahwa penerapan Direct Instruction secara sistematis dan konsisten dapat menjadi alternatif efektif bagi guru dalam mengoptimalkan hasil belajar sains di tingkat sekolah menengah pertama.*

Keywords: *Direct Instruction; Learning Outcomes; Biotechnology; Islamic Junior High School Students.*

INTRODUCTION

learning process in school in essence is effort systematic For develop potential participant educate through interaction educative between teachers, students and the environment Study (Susiana & Wening, 2015) . However , in in practice , still often found problem an low results Study students who are sourced from lack of variation learning methods and models used by teachers. Learning process tend

nature conventional , where teachers are more dominant convey material verbally without involving student in a way active in understand draft (Wachyuni, 2022) . As a result , students only play a role as recipient information passive and not own enough opportunity For construct knowledge in a way independent . Situation This impact on low motivation learning , weakness understanding conceptual , as well as No achievement objective optimal learning .

One of the learning models that emerged as solution to problem the is the Direct Instruction model (Mason & Otero, 2021) . This model emphasize importance structure systematic learning , where the teacher plays a role active in give explanation , demonstration , practice guided , and bait clear return to students . Advantages main of Direct instruction lies in its ability facilitate student For reach deep understanding to material through stages directed and measurable learning . This model very effective used in demanding learning mastery procedures , concepts , or skills base (Hidayati et al., 2022) . However Thus , Direct instruction also has limitations , especially when applied to the context demanding learning creativity , reflection , and problem solving problem complex , because approach This tend positioning teachers as center activity learn . Therefore that , the effectiveness of this model very depends on the teacher 's ability balance aspect instructional with participation active student (Widiastini, 2020) .

Study of the application of the Direct instruction model becomes important For done remember urgency improvement quality results study in various level education (Alhaq et al., 2022) . In context learning at school base and medium , this model believed can become alternative strategic For overcome problem low understanding conceptual student to material lessons that are of a nature factual and procedural (Budiman et al., 2020) . Besides that , study this also becomes relevant Because placing teachers not just as transmitter information , but as designer experience systematic and directed learning (Sierra-Ríos et al., 2020) .

A number of study previously has show consistent results about effectiveness of Direct instruction in increase results Study students . For example , research by Magliaro , Lockee , and Burton (2005) showed that Direct instruction is capable increase retention knowledge and transfer of skills to various context learning . Another study by Stockard et al. (2018) found that that this model effective in increase achievements academic students in the field mathematics and literacy . Meanwhile that , research by (Widiastini, 2020) in Indonesia confirmed that the application of Direct instruction can repair results learn science through more learning structured . Findings similar put forward by (Sekar, 2020) who reported improvement significant in ability think logical student after implementation of Direct Instruction. In fact , research by Rosenshine (2012) shows that Direct instruction principles correlate positive with quality teaching effective in various eye lessons . Five studies the show proof strong

empirical that approach instructional direct own contribution real to improvement results Study students in various context education .

Based on the above exposure , research This aim For analyze application of the Direct instruction model in effort increase results Study students in context classroom learning . Research this also attempts answer question main : what application of the Direct instruction model can in a way significant increase results Study student compared to with learning models conventional ? Through systematic analysis supported by empirical data , research This expected can give contribution theoretical to development strategy effective learning , as well as contribution practical for teachers in optimally implement the Direct instruction model for reach results learn more Good

METHOD

Study This use approach Study Class Action (PTK) implemented in two cycle For increase results Study student through implementation of the Direct Instruction model. Each cycle study covering four stages main , namely planning , implementation acting , observing , and reflecting . Research performed on the eyes science lessons , especially material Biotechnology , in class IX B MTsN 4 Jombang year 2025 lesson . Subject study totaling 30 students in total is student men . At this stage planning , researcher compile device learning and instruments relevant research with objective improvement results learning . Stage implementation focused on the implementation of the direct instruction model systematic in accordance with stages learning . Next , the next stage observation done For take notes activity Study students and identify development results study , while stage reflection used For analyze results observation as well as designing improvements to the cycle next use reach improvement results more optimal learning .

RESULTS AND DISCUSSION

Implementation actions on the cycle First aim For identify problem fundamental in the learning process material Biotechnology in class IX B MTsN 4 Jombang . At the stage this , the teacher still use method lecture as approach main in delivery material . Based on results evaluation , obtained class average grade amounting to 69.71 with percentage completeness the same learning , namely 69.71 % . In detail , there were 5 students who received score 50, 4 students with score 60, 8 students get score 65, 4 students get score 70, 4 students with score 75, 6 students get score 80, 3 students get score 90, and only 1 student achieved it mark perfect 100. The result show that part big student Not yet reach Criteria The minimum completeness (KKM) set is 75. Conditions This indicates that implementation learning in cycles First not optimal, especially Because method lecture not enough capable push involvement active students and not yet effective in help they understand draft base biotechnology in a

way comprehensive . Therefore that , is necessary action repair through implementation strategy more learning participatory and structured in the cycle next .

On cycle Second , the teacher does repair with implementing a combined Direct instruction model with method discussion For increase understanding conceptual and engagement student in the learning process . Strategy This implemented with more systematic through stages explanation , demonstration , practice guided , and bait come back direct from the teacher. Evaluation results in the cycle second show significant improvement with class average grade reached 87.43 and the percentage completeness Study by 81.88 % . more specifically , there were 3 students who received score 60, 16 students with score 80, and 11 students achieved value 100. The data indicates that part big student has understand material with good and capable apply draft biotechnology in context learning . Based on results said , researchers conclude that implementation repair learning in cycles second has been optimized. The Direct instruction model has been proven effective in increase results Study student through a deeper learning process directed , interactive , and mastery - oriented concept . With Thus , the action repair stopped in cycle second Because objective study has achieved .

Distribution value in the cycle First show pattern sufficient distribution wide with multimodal tendencies , indicating that ability student to material Biotechnology Still varied and not yet reach level even understanding . Mode or most frequent value appear is at 65 with amount eight students , meanwhile range mark range between 50 and 100. Distribution This show that there is group students who are still left behind in understand concepts base biotechnology , especially those who obtain score below 65. The presence of five students with the value of 50 also confirms that part participant educate Not yet capable fulfil standard expected competencies . While that , group students who achieve category mark high (80 to above) still classified as a little , namely six student with value 80, three student with value 90, and only One students who get mark perfect 100. Distribution pattern This describe that learning that is still ongoing dominated method lectures on the cycle First Not yet effective in activate participation student and ensure equality understanding between they .

Significant transformation seen in the distribution values in the cycle second after implementation of the Direct Instruction learning model which is combined with approach discussion . At this stage this happened mode shift from value 65 to value 80, with frequency highest reach nine students . Shift This show existence improvement general in achievements results Study as well as centralization values in higher categories high . Distribution mark become more directed and focused , where students only divided into two category mark main , namely 60 and 80, while category mark low until medium such as 50, 65, 70, and 75 no Again appear . Phenomenon This signify that previous students be in a group achieve low or currently has experience a real improvement . In terms of conceptual , thing This in line

with characteristics of Direct instruction that emphasize clarity objective learning , giving explanation explicit , as well as exercise guided assistance student understand steps learning in a way systematic .

Interestingly , in the cycle second , no found Again student with mark extreme high (90 and 100) as seen in the cycle first . This is possibility caused by adjustments level difficulty evaluation or shift concentration results Study to mark more central evenly at 80. From the perspective pedagogical , conditions This precisely describe success of Direct instruction in create equality achievements academic , where the majority student capable reach the same competency . This model in a way implicit emphasizes consistency and equality results Study through directed teaching , so No only highlight a number of student achieve high , but also pushing improvement performance collective all over class .

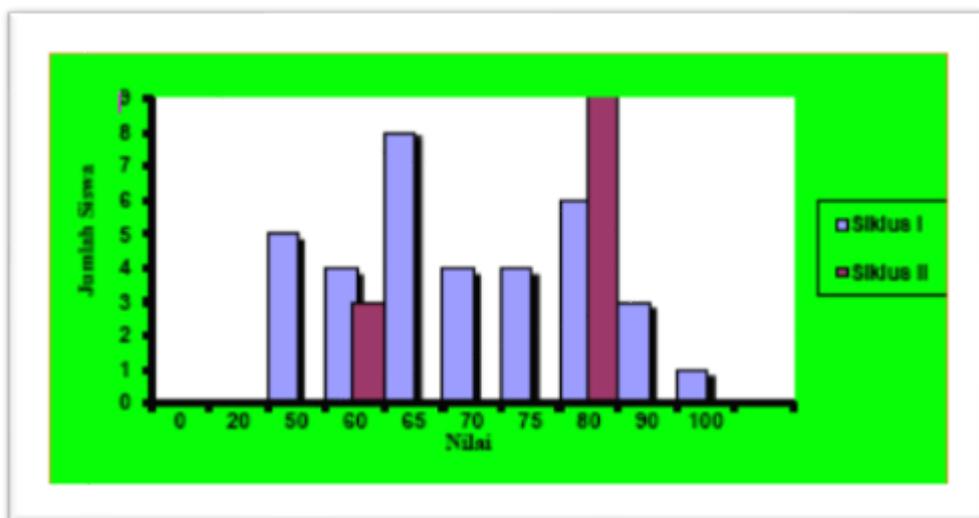


Figure 1. **Results** of Cycles I and II

From the data above shown comparison results between cycle first and second show effectiveness real from application of the Direct instruction model in increase results Study students . The mode shift from value 65 to 80 becomes indicator empirical that happen improvement average ability class in a way comprehensive . Students who previously is in the category mark low and medium succeed move going to level greater mastery high . This is show that intervention learning that is explicit , structured , and based exercise guided capable repair achievements Study in a way significant . With Thus , the pattern distribution greater value category - centered tall become reflection the success of the Direct instruction model in increase understanding conceptual and skills cognitive student to material Biotechnology .

Findings This strengthen argumentation theoretical that direct instruction is an effective learning model when implemented in context demanding teaching mastery procedural and understanding systematically . Through stages clear learning start from delivery purpose , giving examples , guidance step by step , until evaluation directly this model give chance for student For build stable and focused

understanding (Dignath & Veenman, 2021) . In context study this , success cycle second No only confirm repair results Study in a way quantitative , but also indicative improvement quality interaction learn more active , structured , and needs - oriented students . With Thus , the application of Direct instruction is proven No just intervention technical , but also strategic capable pedagogue transforming the learning process become more effective , results - oriented , and encouraging equality achievements academic among participant educate .

Direct instruction learning model has a number of the advantages that make it effective in increase results learning , especially in the context of demanding learning clarity concept , mastery steps procedural , and achievement competence basic . One of the superiority mainly is structure systematic and directed learning . Every stages , starting from delivery objective learning , giving example concrete , practice guided , until evaluation results learning , designed in a way sequentially For ensure student understand every component material before step to stage next . Clarity instructions given by the teacher make student No experience confusion in follow the learning process . Besides that , this model is also effective in save time learning Because focus mainly is achievement measurable results , not too much exploration wide . In context classroom learning with ability heterogeneous students , Direct instruction is also capable give direction clear learning for student capable low , because they get guidance intensive and bait come back direct from teachers at every stage learning (Jay, 2023) .

Besides clarity structure , another advantage of Direct instruction lies in its ability in create discipline high learning . This model push student For focus and follow channel learning that has been set , so that atmosphere class become more orderly and conducive . Teachers have control full to the course of the learning process , ensuring that every student follow instructions and achieve the expected competency targets . With Thus , learning become more efficient and results Study can measured with more objectively . empirically , this model proven increase retention knowledge and skills transfer , because student No only accept information , but also trained in a way active through examples and exercises gradual strengthening understanding conceptual they .

However thus , behind various its advantages , Direct instruction also has a number of necessary limitations attention . The shortcomings mainly lies in its teacher - centered tendency , where the teacher becomes source main information and control main activity study . In situation this , space for student For explore , think critical , and put forward opinion in a way free become limited . As a result , although results Study cognitive can increased , ability affective and psychomotor related with creativity , work same , and reflection self often less sharpened . Besides that , this model not enough suitable For demanding learning solution problem open or creativity high , because channel too much learning structured can limit flexibility think student .

Weakness other lies in high dependency to the role of the teacher. If the teacher does not own ability good communication , no capable give clear example , or not enough skilled in manage dynamics class , then the effectiveness of this model will decrease in a way significant . Besides that is , Direct instruction requires teacher readiness in designing proper instructions and accurate assessment at every stages , so that learning No only nature mechanical but also meaningful . With However , although direct instruction has been proven capable increase results Study in a way significant in context certain , its success still depends on the quality planning , skills teacher pedagogical , as well as suitability its implementation with characteristics materials and needs participant educate (Saputro et al., 2025)

CONCLUSION

Based on results study action classes conducted through two cycle learning , can concluded that the application of the Direct instruction model is capable increase results Study students on the material Biotechnology in class IX B MTsN 4 Jombang year lesson 2025. This is seen from average increase in grades student from 69.71 on the cycle First to 87.43 in the cycle second , and improvement completeness Study from 69.71% to 81.88%. Shift in value mode from 65 to 80 indicates that part big student experience improvement understanding to the material being taught . With Thus , the application of the Direct instruction model is proven effective in help student understand draft Biotechnology in a way systematic and focused through learning that is structured and focuses on mastery gradually .

Research result This confirm that direct instruction can made into strategy alternative in learning science , especially in materials that require explanation clear conceptual and procedural . Teachers can utilize this model For create atmosphere active , directed , and measurable learning , with give guidance direct as well as bait continuous feedback . However , in order for learning to become more balanced , teachers are advised For combine these models with an encouraging approach participation and creativity students , so that No only increase results Study in a way cognitive , but also formative attitude scientific and skills think more critical deep .

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