



THE EFFECTIVENESS OF INTEGRATING PROBLEM-BASED LEARNING AND SPEED READING STRATEGIES IN IMPROVING READING SPEED AMONG MEDICAL RECORD STUDENTS AT SAPTA BAKTI BENGKULU

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ABSTRACT

The increasing complexity and volume of medical record documentation demand students to read efficiently and accurately. However, conventional learning approaches often do not adequately support the development of effective reading strategies aligned with professional needs. This study aimed to examine the effectiveness of integrating speed reading strategies within the Problem-Based Learning (PBL) model to improve reading speed among medical record students. This study employed a quasi-experimental design involving 60 second-year medical record students at STIKES Sapta Bakti Bengkulu. The intervention was conducted over six weeks by embedding speed reading techniques into the stages of the PBL learning process. Students' reading performance was assessed using pre-test and post-test measurements of reading speed. The data were analyzed using comparative statistical analysis to determine the effectiveness of the intervention. The results showed a significant improvement in students' reading speed after the implementation of PBL-based speed reading activities. The average reading speed increased from 150 words per minute (wpm) in the pre-test to 250 wpm in the post-test, with the difference being statistically significant ($p < 0.05$). These findings indicate that the integration of speed reading strategies within a problem-based learning environment effectively enhances students' ability to process medical record texts more efficiently. In conclusion, integrating speed reading strategies into the Problem-Based Learning model is effective in improving reading speed among medical record students. This approach provides a relevant instructional strategy that supports the cognitive demands of medical record analysis and contributes to the development of effective learning practices in medical record education.

Keywords : *Problem-Based Learning (PBL), Speed Reading, Reading Efficiency, Medical Record Students.*

INTRODUCTION

In the era of the Industrial Revolution 4.0 and the rapid expansion of Electronic Health Records (EHR), healthcare institutions are confronted with an unprecedented increase in the volume, diversity, and complexity of medical information. This condition has intensified information overload in healthcare services, particularly in clinical documentation management (Khan et al., 2021). Medical record professionals are no longer tasked solely with

storing and documenting patient data; they are also responsible for interpreting, validating, and synthesizing large volumes of clinical information within limited time frames. Consequently, higher education institutions that prepare medical record professionals must ensure that graduates possess advanced information literacy skills, particularly the ability to read medical records efficiently, accurately, and analytically.

According to the American Health Information Management Association (AHIMA), rapid clinical record review is a core professional competency that directly influences coding accuracy, clinical decision support, and hospital revenue cycle management. Delays or inaccuracies in reading medical records may lead to coding errors, misclassification of diagnoses, and inefficiencies in healthcare services. Therefore, reading speed in medical record education should be understood not merely as a linguistic or academic skill, but as a technical and professional competency essential for effective healthcare delivery (Murphy, 2023).

Despite its importance, reading medical records presents unique challenges for students. Medical record documents are characterized by dense medical terminology, abbreviations, fragmented narratives, and non-linear data structures. Unlike conventional academic texts, medical records require readers to continuously shift attention between diagnostic notes, laboratory results, treatment plans, and administrative codes. Research on reading performance in academic and technical fields indicates that average reading speed ranges between 200 and 250 words per minute; however, exposure to specialized medical texts significantly reduces reading speed and increases cognitive load (Jiang et al., 2022).

Empirical evidence suggests that traditional instructional approaches in medical education often rely on passive reading and memorization strategies. Such approaches tend to result in shallow information processing, limiting students' ability to identify clinically significant patterns within complex medical documentation (Dolmans et al., 2022). O'Brien et al. also reported that students who rely primarily on memorization often experience difficulties extracting essential information efficiently, particularly under time constraints commonly encountered during clinical practice.

Problem-Based Learning (PBL) has been widely adopted in medical and health sciences education as an instructional model that emphasizes active learning, contextual understanding, and collaborative problem-solving. Schmidt et al. (2011) demonstrated that PBL enhances meaningful learning by engaging students in authentic problem scenarios that require analysis, interpretation, and decision-making. Further studies have shown that PBL promotes deeper cognitive engagement and supports the development of professional competencies in medical education (Hassan et al., 2021).

Within the context of medical record education, PBL offers particular advantages. By presenting students with realistic medical record cases, PBL encourages learners to identify relevant information, distinguish between primary and secondary diagnoses, and justify coding decisions. These activities closely mirror professional tasks performed by medical record officers and therefore provide an appropriate pedagogical framework for developing analytical and strategic reading skills (Meyer & Main, 2023).

Preliminary observations conducted at STIKES Saptia Bakti Bengkulu revealed several recurring challenges faced by students in the Medical Record program during clinical practice. Students required excessive time to analyze a single medical record file, resulting in inefficiencies in documentation and coding workflows. Attempts to increase reading speed were often accompanied by difficulties in maintaining analytical accuracy, particularly in identifying secondary diagnoses and comorbidities essential for accurate diagnosis classification. Existing instructional practices also tended to emphasize memorization of medical terminology rather than selective and strategic reading skills.

These challenges indicate a mismatch between instructional methods and the competencies required in professional medical record practice. Although Problem-Based

Learning has been extensively examined in nursing and medical education, its integration with structured speed reading strategies in medical record education remains limited. Most existing studies focus either on PBL as a general instructional model or on speed reading as an isolated skill, without examining their systematic integration within a single learning framework.

Therefore, this study aims to examine the effectiveness of integrating speed reading strategies within the Problem-Based Learning model to improve reading speed among medical record students. By structuring learning activities according to the PBL syntax—problem orientation, problem analysis, self-directed learning, collaborative discussion, and reflection—this study seeks to contribute evidence-based instructional strategies that align medical record education with the demands of contemporary healthcare practice.

METHODS

This study applied a quasi-experimental approach with an emphasis on the learning process rather than solely on testing outcomes. The instructional intervention was designed based on the syntactic stages of the Problem-Based Learning (PBL) model, integrated with speed reading strategies relevant to medical record analysis. The learning process focused on developing students' abilities to read medical records efficiently, selectively, and analytically through authentic problem-solving activities.

The PBL-based learning activities were conducted over a six-week period and implemented through the following stages. First, students were introduced to authentic medical record cases derived from real clinical documentation (problem orientation). These cases required students to identify essential clinical information under time constraints. Second, students analyzed the problems collaboratively to determine learning objectives, key reading challenges, and relevant sections of the medical records (problem analysis). Third, students engaged in self-directed learning activities by applying speed reading techniques such as keyword scanning, selective reading, and information mapping to medical record texts. Fourth, group discussions were conducted to compare interpretations, justify findings, and refine reading strategies. Finally, reflective evaluation sessions were held to review both the problem-solving process and the effectiveness of the applied reading strategies.

The participants consisted of 60 second-year students enrolled in the Medical Record program at STIKES Sapta Bakti Bengkulu. The students were divided into an experimental group and a control group. The experimental group participated in the PBL-based learning process integrated with speed reading strategies, while the control group received conventional instruction emphasizing lectures and memorization of medical terminology. All learning activities were conducted within regular course schedules.

To support the evaluation of the learning process, reading performance assessments were administered before and after the instructional intervention. These assessments measured reading speed in words per minute (WPM) and comprehension of medical record content. The pre-test and post-test results served as supporting data to examine changes in students' reading performance following the learning process. Quantitative data were analyzed using paired t-tests to determine statistically significant differences, while qualitative data from student reflections were analyzed descriptively to capture learning experiences and perceived benefits of the instructional approach.

Ethical approval was obtained prior to the implementation of the study. All participants provided informed consent, and confidentiality of student data was maintained throughout the research process.

Table 1: Learning Activities Based on the Syntax of Problem-Based Learning (PBL)

PBL Syntax	Description of Learning Activities
1. Problem Orientation	Students were introduced to authentic medical record cases derived from real clinical documentation. The cases were designed to highlight reading challenges such as dense terminology, abbreviations, and the need to identify key clinical information efficiently.
2. Problem Analysis	Students collaboratively analyzed the cases to determine learning objectives, identify relevant sections of the medical records, and recognize reading difficulties related to diagnoses, comorbidities, and coding requirements.
3. Self-Directed Learning	Students independently applied speed reading strategies, including keyword scanning, selective reading, and information mapping, to extract essential information from medical record texts.
4. Collaborative Discussion	Group discussions were conducted to compare findings, justify interpretations, and refine reading strategies based on peer feedback and group reflection.
5. Reflection and Evaluation	Students reflected on both the problem-solving process and the effectiveness of the applied reading strategies. Learning outcomes were supported by reading performance assessments conducted at the end of the instructional period.

Source: Adapted from Schmidt, Rotgans, & Yew (2011).

RESULTS

The learning process was conducted over a six-week period using the Problem-Based Learning (PBL) model integrated with speed reading strategies. Learning activities were organized according to the PBL syntax, beginning with the presentation of authentic medical record cases. Students were introduced to real clinical documentation and coding scenarios that required them to locate, interpret, and prioritize information efficiently.

During the problem orientation stage, students were presented with complete medical record files, including diagnostic notes, laboratory results, and treatment summaries. At this stage, students were guided to identify reading challenges, such as dense terminology, abbreviations, and non-linear information structures.

In the problem analysis stage, students worked in small groups to determine key information needed to solve the case, such as primary diagnoses, secondary diagnoses, and relevant clinical indicators. Reading activities at this stage emphasized selective reading, scanning, and keyword identification rather than linear reading.

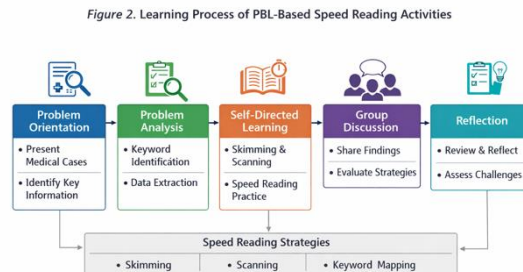
The self-directed learning stage focused on the application of speed reading strategies. Students independently practiced skimming, scanning, and information mapping techniques while working with medical record documents. These activities aimed to improve reading efficiency while maintaining comprehension of essential clinical information.

Subsequently, during the collaborative discussion stage, students shared findings, compared extracted information, and discussed differences in interpretation. This stage allowed students to refine their reading strategies and confirm the accuracy of the information obtained from the medical records.

Finally, in the reflection and evaluation stage, students reviewed both the problem-solving process and the reading strategies used. Reflections focused on reading efficiency, comprehension, and difficulties encountered during document analysis.

The sequence of learning activities is illustrated in Figure 2.

Figure 2. Learning Process of PBL-Based Speed Reading Activities



(Figure description: a flow diagram illustrating PBL stages: problem orientation, problem analysis, self-directed learning, group discussion, and reflection, integrated with speed reading strategies.)

Following the completion of the learning process, students’ reading performance was assessed to support the observation of learning outcomes. Reading speed measurements indicated a clear improvement after the implementation of the PBL-based learning activities.

Table 2 presents the comparison of students’ average reading speed before and after the intervention.

Table 2. Pre-test and Post-test Results of Reading Speed

Category	Pre-test (Average)	Post-test (Average)	P-value
Speed Reading Skills	150 words/minute	250 words/minute	< 0.05

The data show an increase in average reading speed from 150 words per minute in the pre-test to 250 words per minute in the post-test. Statistical analysis indicated that the difference between pre-test and post-test scores was significant ($p < 0.05$).

DISCUSSION

The results of this study indicate that the integration of speed reading strategies within a Problem-Based Learning (PBL) framework is associated with meaningful improvements in students’ reading performance in medical record education. The observed increase in reading speed suggests that students were able to process medical record documents more efficiently after participating in learning activities designed around authentic professional problems. This finding is consistent with previous studies indicating that structured reading strategies can enhance efficiency when embedded in meaningful learning contexts (Jiang et al., 2022; Murphy, 2023).

This improvement can be understood through the pedagogical alignment between PBL and the cognitive demands of medical record analysis. Medical records are characterized by

fragmented information, dense terminology, and non-linear structures that require readers to prioritize relevant data rapidly (Khan et al., 2021). The PBL approach encourages students to engage with reading tasks through a problem-oriented lens, prompting them to identify essential information rather than read texts sequentially. When combined with speed reading techniques, such as scanning and selective reading, students appear to develop more strategic reading behaviors that support efficiency without sacrificing task relevance.

The findings are consistent with prior research suggesting that active learning environments enhance cognitive engagement and information processing. As noted by Meyer and Main (2023), problem-centered learning activities foster deeper understanding and sustained engagement. In this study, students' exposure to realistic medical record cases likely contributed to the development of contextual understanding, enabling them to form cognitive frameworks that facilitate faster information retrieval. This supports earlier assertions by Schmidt et al. (2011) and Dolmans et al. (2022) that PBL promotes the organization and application of knowledge through meaningful learning contexts.

Importantly, the improvement in reading speed observed in this study did not occur in isolation. Speed reading strategies were embedded within collaborative problem-solving activities that required students to justify interpretations, compare findings, and reflect on reading outcomes. This structure may explain why increased reading efficiency did not undermine comprehension, addressing concerns raised in previous studies that speed reading can lead to superficial understanding when taught independently (Jiang et al., 2022). The reflective and collaborative components of PBL appear to play a critical role in maintaining analytical accuracy alongside increased reading speed (Hassan et al., 2021).

From a professional education perspective, these findings have important implications for medical record training. Medical record officers are required to review large volumes of documentation under time constraints while maintaining accuracy in diagnosis classification and coding. Instructional approaches that mirror these professional conditions may better prepare students for workplace demands (Majid et al., 2020). The integration of PBL and speed reading strategies offers a learning model that aligns academic instruction with real-world professional competencies.

Despite these positive outcomes, several limitations should be acknowledged. This study was conducted within a single institution and over a relatively short instructional period, which may limit the generalizability of the findings. Additionally, while reading speed improvement was evident, further research is needed to examine long-term retention of reading skills and their transferability to professional practice settings. Future studies could also incorporate more detailed measures of comprehension accuracy and explore the role of digital tools in supporting speed reading and collaborative learning (Taylor et al., 2023).

Overall, this study contributes to the growing body of literature on active learning in medical education by demonstrating the potential benefits of integrating speed reading strategies into a Problem-Based Learning framework. While further investigation is required, the findings suggest that this instructional approach can support the development of efficient and purposeful reading skills essential for medical record professionals in increasingly complex healthcare environments (Dolmans et al., 2022).

CONCLUSION

This study concludes that the integration of speed reading strategies within a Problem-Based Learning (PBL) framework is associated with a significant improvement in reading speed among medical record students. Based on the pre-test and post-test results, students demonstrated a marked increase in average reading speed after participating in PBL-based

learning activities, indicating that this instructional approach supports more efficient processing of medical record documents.

The findings suggest that the effectiveness of this approach lies in its alignment with the cognitive demands of medical record analysis. By engaging students in authentic problem scenarios and guiding them to apply selective and strategic reading techniques, the learning process enables students to prioritize clinically relevant information rather than rely on linear reading. This integration allows improvements in reading speed to occur alongside analytical engagement with medical record content.

From an educational perspective, these results indicate that combining PBL with speed reading strategies provides a practical pedagogical model for medical record education. Such an approach not only addresses students' difficulties in managing dense and non-linear medical texts but also supports the development of professional reading competencies required in clinical and coding contexts.

Although this study was conducted within a limited setting, the findings provide empirical support for the use of PBL-based speed reading instruction as an effective learning strategy in medical record education. Future research is recommended to examine the long-term impact of this approach on reading comprehension accuracy and its applicability across different health information management programs.

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