



Transforming Language Education Students' Research Skills through Research-Based Learning Innovation

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Abstract

Several studies have shown that students face difficulties in conducting research and writing academic texts, resulting in delays in completing their studies. Meanwhile, national standard qualifications require students to publish their research results in reputable national journals. Therefore, the purpose of this study is to reveal the stages of students' learning to conduct research, especially in designing, implementing, and disseminating research results using a research-based learning model. This study used a research design approach in three stages: preliminary design, learning experiment, and retrospective analysis. Within 6 months, a learning trajectory was used to improve the research skills of 12 PBSI students at Muhammadiyah Purworejo University. This was done by observing the activities of lecturers and students and documenting the final learning outcomes. The results showed that five of those who met the criteria for research skills could reach the stage of publication in a Google Scholar-indexed journal, two could reach the stage of writing a thesis, two could reach the proposal and seminar stages, and one could reach the stage of making a research proposal, and two were still in the research design stage. In addition, this study also describes the factors that cause the diversity of learning outcomes obtained by students, namely intelligence and literacy.

Keywords: Language Education, Research Skills, Research-based Learning, Educational Innovation, Student Skills Transformation

Introduction

Research shows that academic writing poses a challenge for many students, potentially extending study time (Bangun, Irmeilyana, & Andarini, 2011; Fathonah, Wahyuningsih, & Wahyuningsih, 2011; Firmansyah, 2014; Pramana, 2014; Santosa, Wiyanarti, & Darmawan, 2009). As part of research training, students must engage in academic writing (Permen, P. 49, 2014), usually lasting 2-4 semesters. Key challenges include a lack of knowledge of research methods, inadequate supervisory capacity, lack of

training and experience in scientific writing, and low student engagement in overcoming difficulties (Firmansyah, 2014; Fathonah, Wahyuningsih, & Wahyuningsih, 2011). Additional challenges include lack of motivation, anxiety, and language barriers (Rahmiati, 2014). Therefore, proficiency in educational research and writing is important to improve the quality of academic writing training. The Directorate of Higher Education has implemented a policy (PERMEN No. 49 of 2014) to encourage increased research and publication by students. KJNI (KJNI Compilation Team for Higher Education, 2013) mandates that students publish the results of their research in nationally recognised journals (KJNI level 6). Researchers have highlighted the advantages of research-based learning in improving students' research skills (Widayati et al., 2010; Waris, 2009; Umar et al., 2011; Webb, Smith, & Worsfold, 2011; GIHE, 2008; University of Adelaide, 2009), especially for students from non-education or pure science backgrounds. In the context of designing academic writing interventions within a design research framework, Prahmana (2014) noted that the learning process in higher education has not provided adequate support for students' academic writing skills. This study aims to build a learning trajectory for language education research using design research methodology to improve the research and academic writing skills of future language educators.

Research-based Learning (RBL) is guided by six principles (Boud & Feletti, 1998) or similar concepts with different terminology (Neo, 2003). The RBL process begins with problem identification, knowledge exploration, problem solving, and conclusion drawing (Farkhan, 2008; Poonpan & Suwanmankha, 2005). RBL is rooted in constructivist philosophy, emphasizes self-directed and student-centered learning, uses research methods to address real-world problems, disseminated through scientific publications. RBL strategies and syntax were developed by GIHE (2008), University of Melbourne (Baldwin, 2005), and Waris (2009). For this, research skills include the ability to uncover the truth through systematic stages and obtain accurate and reliable data to answer hypotheses (Waris, 2009; Webb, Smith, & Worsfold, 2011; LIPI Research Professors Council, 2007). In research-based universities, systematic investigation of phenomena and problems to expand knowledge is a fundamental activity (Widayati et al., 2010; Waris, 2009; Umar et al., 2011; GIHE, 2008; Baldwin, 2005). Research skills are important for developing students' competence and self-awareness. The Primary Years Program (PYP) Curriculum Framework specifies eight indicators of research skills (International Baccalaureate, 2009), while Willison & O'Regan (2007) developed six indicators in their Handbook for the Development and Assessment of Research Skills in the Curriculum..

Academic writing skills involve the ability to produce written works that follow standardized language rules and certain methodologies (Supriyadi, 2013; Rahmiati, 2014). The process of writing academic texts includes various stages, including idea generation, observation, research, experimentation, collecting supporting data and theories, and documenting findings (Rahmiati, 2014). Ideas, text planning, paragraph development,

writing drafts, and finalization are common steps in writing scientific articles (Suprarno, 2012). In addition, Supriyadi (2013) mentions several steps in writing scientific papers. These include understanding what scientific work means; selecting a topic; limiting the topic; formulating a title and problem; constructing ideas and paragraph groups; drafting a thesis and framing the scientific work; citation processing; language use; referencing; and editing. According to Zulkarnain (2012), scientific papers must meet language standards, including grammar, word choice, and sentence effectiveness. Students have difficulty in writing scientific papers because of all these stages and requirements (Yuniawan & Wardani, 2008). Therefore, special treatment is needed in learning to write scientific papers by monitoring each stage through certain indicators in order to produce good writing skills. To improve the ability of students or prospective language teachers in conducting research, researchers are encouraged to develop a Hypothetical Learning Trajectory (HLT). Furthermore, the researcher formulated the research problem: (1) How does a research-based learning model help Language Education Study Program students acquire research skills? (2) How do students go through the stages of language education research learning to acquire research skills?

Methods

Initial design, instructional trial, and retrospective evaluation are some of the stages used in this research methodology. Design research, as described by Gravemeijer and Eerde (2009), is a collaborative approach between researchers and educators aimed at enhancing learning quality. This methodology, characterized by its interventionist nature, process orientation, reflective component, cyclic character, and theory focus, is delineated by Akker et al. (2006). In this study, there are two key elements, namely Hypothetical Learning Trajectory and Local Instruction Theory. The approach allows students to develop their own language and conceptions, while educators choose appropriate activities to stimulate students' cognition and action in language teaching. To this end, Savelsbergh and Gravemeijer (2009) present HLT as follows: setting goals, through learning tools or media, highlighting progress or setbacks in understanding the learning process, and developing students' strategies throughout the learning journey.

Concretely, the purpose of design research is "to discover empirical sequences of activities and gain empirical insight into the functioning of learning paradigms" (Cobb et al., 2001, 3) as well as "design research uses the concept of learning trajectories" (Research Advisory Committee, 1996). In this regard, Wang and Hannafin (in Wijaya 2008) characterize design research as a systematic yet flexible methodology, which aims to improve educational practice through iterative analysis and implementation.. To visualize the students' learning process in language education in this study, various data sources were used, including interviews, students' portfolios, questionnaires, and photos of research-

based learning activities. Furthermore, the data obtained were re-analyzed using the HLT guide. This analysis was conducted in collaboration with the supervisor and followed by a seminar on the research results to increase validity. The study was conducted during the odd semester of the 2023/2024 academic year. Consisting of 12 students of the Indonesian Language Education Study Program of Muhammadiyah Purworejo University, consisting of 10 students of the 2019/2020 batch and 2 students of the 2020/2021 batch, these were the subjects of the study. The study consisted of three stages and was conducted repeatedly until a new theory that changed the learning theory was tested.

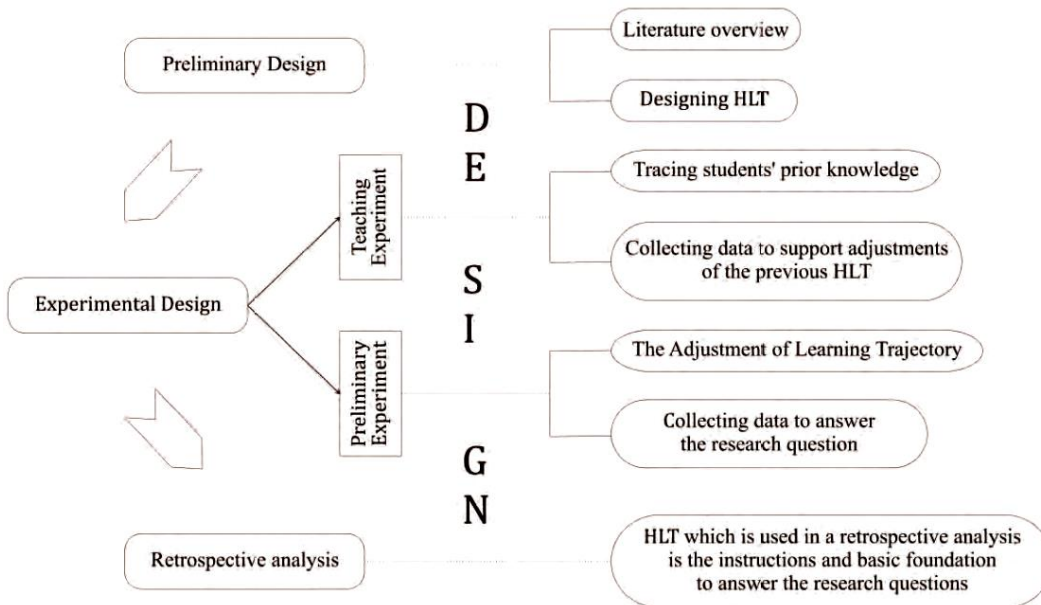


Figure 1: Research design stage (Prahmana, 2012)

Results

The research findings show that the use of the PBR model in language education learning is essential for improving students' research skills. During the learning process, the syntax of this research-based model can assist students in completing their studies and gaining a deeper understanding of the language materials used in research, thus improving their language proficiency. In this context, during the inference phase, the researcher facilitates and encourages learning and discussion in the classroom. They also supervise all research instruments. The learning process includes a research trajectory that starts with problem identification and a literature review. It then proceeds with the selection of an appropriate research design and methodology, followed by data collection and analysis to answer the research questions. The final stage involves writing a research report and

depositing it as a scholarly article in a journal or library archive.

Research outcomes vary among students or research subjects based on the designed learning pathway. These outcomes are evaluated using research skills indicators, which assess students' ability to formulate a problem, make observations, develop a research plan, sort and describe research data, analyze findings, and communicate their research results through academic forums or publications. To provide a clearer picture, this study uses the research-based learning model to describe the language learning process. This process includes three stages: initial design, learning experiment, and retrospective analysis. All these stages are derived from the research findings.

Preliminary Design

In this step, the initial concept of the research-based learning model is applied. This begins with collecting and reviewing literature, making initial observations about the research concepts that students will learn, and designing a hypothetical learning trajectory (HLT). This process is depicted in Figure 2.

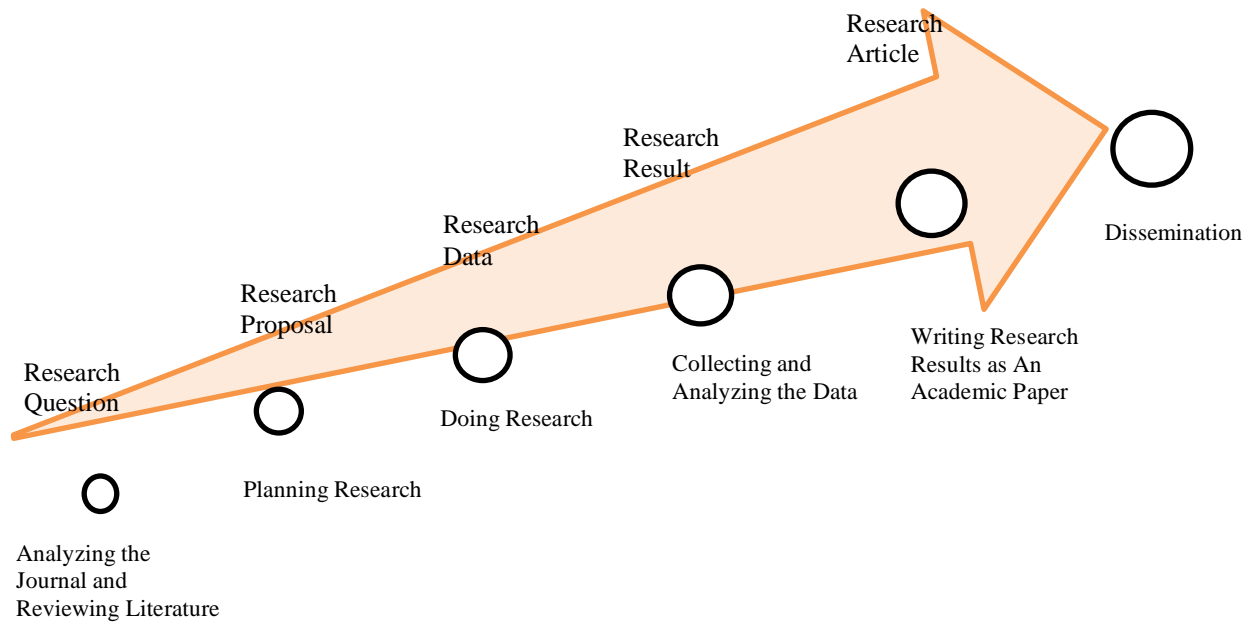


Figure 2: *Learning Trajectory* research in education

One of the learning activities in this study aims to enhance students' research

capabilities. These activities are designed based on the syntax of a research-based learning model. The research is grounded in indicators intended to improve students' thought processes, as hypothesized. The instructional activity scheme has been divided into six activities that must be completed within a six-month learning period. This activity starts from finding the problem to the final conclusion, and meetings are held once every week to review the literature, research hypotheses, conduct data collection, analyze data, and conclude research results (Table 1).

Table 1: Experimental research learning trajectory

Find the Problem	Literature Review	Hypothesis	Data Acquisition	Data Analysis	Conclusion
1.Looking for problems	1.Reviewing relevant theories and research results	1.Making a research hypothesis as an answer to a problem	1.Determining populations and samples	1.Analyze the data that has been collected	1.Make a conclusion of the research results in accordance with the formulation of the problem
2.Identify and limit issues	2.Synthesize the results of relevant studies and research	2.Testing research hypotheses	2.Developing and testing instruments	2.Interpreting data analysis results	2.Making suggestions for your next research
3.Creating a problem formulation	3.Answering problem formulations based on synthesis results		3.Collecting research data	3.Making research results and discussion	

Teaching Experiment

At this stage, the learning model designed in the initial design phase is implemented. This activity is based on the syntax of research-based learning models and aligned with the learning outcomes of the research proposal seminar course and research skill indicators. The learning process commences with an examination of the research problem through a review of relevant literature, previous research findings, and observations at the research site. Following the literature review and classroom observations, students formulate hypotheses as tentative solutions to the problem. Subsequently, they develop research instruments to collect data and analyze it to test their research hypotheses. Finally, students analyze the data and compose a thesis or scientific paper for publication, dissemination, and inclusion in scientific journals. Throughout the learning process, researchers and supervising lecturers provide guidance and oversight to students conducting research.

Retrospective Analysis

The system used for the research-based learning model has steps that must be taken but can be adjusted throughout the learning process. The learning trajectory has been adapted to the research proposal and RPS for learning seminar proposals for Indonesian Language and Literature. The goal is to improve research skills, which are adjusted to the learning indicators. Therefore, this learning process can serve as a compelling rationale to address the research question: how do the role and trajectory of research-based learning models assist students in acquiring research skills? Students have mastered research skills through these learning stages.

This research paper presents the data analysis conducted. It elaborates on the research findings in accordance with the objectives, problems, and methodologies outlined in the research methods section. The results of the data analysis have been presented using models, attributes, statistical analyses, hypothesis testing, and other elements that align with the chosen research attributes. To enhance reader comprehension, tables, figures, or quotations have been included to illustrate the research outcomes.

Discussion

The Role of the PBR Model in Fostering Research Skills of Students of the Language Education Study Program

This research aims to enhance students' research skills and assist them in preparing research proposals, theses, and articles for publication in scientific journals, in accordance with the undergraduate competency standards set by the Indonesian National Qualifications Framework (KKNI) and the Directorate General of Higher Education's circular on scientific publications. Initial observations revealed that most students were interested in participating in experimental research. Consequently, a learning pathway for experimental research was designed. The following outlines students' final achievements in meeting research skill indicators (Dellia et al., 2023; Purwanto et al., 2023; Qomaruddin et al., 2017)

Students demonstrated the ability to formulate research problems, conduct observations to gather information, and select appropriate research methodologies. The study involved ten seventh-semester students and two fifth-semester students from the Indonesian Language and Literature Education Study Program. The majority of research subjects opted for quantitative research to address their research questions. Four students chose language learning as their research topic, while eight students focused on literature learning. The majority of students possess the ability to create research designs, sort data, and provide descriptions. Nine students have already developed research plans, while three more are in the process. Results indicate that students struggle with creating research

designs due to their inability to analyze previous research journal findings. Additionally, they are overly focused on validating and refining research designs and instruments, leaving them unable to sort and describe research data. Out of 12 research subjects, only 9 met these indicators; the remaining subjects require extended research time.

Students have demonstrated the capacity to analyze research data to address problems, interpret findings, and draw conclusions. The research stage indicators have been met by 9 seventh-semester students and 3 fifth-semester students (75%). This is attributed to four students conducting two research classes (experimental and control) to examine effects, while eight students conducted only one class to observe improvements. Overall, all four students were able to meet these criteria. This success is due to intensive facilitation by teachers and the implementation of a collaborative learning system that utilizes student-centered learning, such as peer tutoring (Coburn, 2022; Pedersen & Liu, 2003). Being part of the same study program and using online communication, each research subject can assist and learn from one another. Furthermore, students feel confident and capable of presenting their research findings to others. They can share their research results in scientific forums or through scientific publications, such as journals or proceedings.

PBR Learning Trajectory That Students Go Through in Fostering Research Skills

The research outcomes are divided into two stages: presentation of research results (thesis) and publication of scientific articles in journals or proceedings. Seven students completed the research results seminar (thesis) stage, while five published scientific articles in national ISSN-indexed journals with Google Scholar indexing. Interviews revealed that publishing research results in national journals posed the greatest challenge. The main focus in addressing the second research question is how research skills develop through a planned learning trajectory. This trajectory consists of activities such as problem identification, observation, research design and instrument creation, data collection and interpretation, conclusion formulation, and research result dissemination (Figure 2). How do students acquire research skills through research-based learning? The modelled trajectory can serve as a basis for answering the second research question.

This study produced a language education learning trajectory divided into six stages. In the first stage, research questions are used for journal analysis, reviewing recent research findings, synthesizing, and considering language education research issues worldwide, enabling students to formulate research problems. The second stage, known as the research proposal, involves research planning, such as examining language education research trends, reading relevant literature, and evaluating it. The third stage is called research data. Furthermore, this stage covers all the processes of conducting research, i.e.,

from making observations to developing research instruments, The activities include validity and reliability tests. Therefore, this evidence of substance causes students to gain expertise in collecting primary data to determine appropriate research methods and design research. After conducting research and data processing, students are expected to be able to compile their research. Then, at this stage, for students to understand the activity, they are asked to determine the conclusions of the research. If all these stages are passed well, students will experience a very high challenge in writing scientific papers (Pamungkas et al., 2023; Rahmiati, 2014; Wan et al., 2018). At the end of the cycle, they will be asked to conference and publish their research results.

Conclusion

Based on the findings, two important aspects of the research-based learning model have a substantial impact on developing prospective teachers' skills in the context of language learning. The syntax of the RBL model has important implications for the development of students' research skills. It contains the framework successively. It can guide students in the research process. In the process, the syntax helps students understand and apply the scientific method systematically, starting with problem formulation and data collection to analysis and conclusion-making. Thus, students can improve their understanding of the research process, which will have an impact on students' emerging thinking skills. This RBL trajectory contributes to the indicators of research skills in the context of linguistic education research. The trajectory is designed as optimally as possible so that each road on the trajectory affects the development and development of different skill indicators such as problem identification, road design, data analysis, action, dissemination, dissemination, and publication. The findings of this study imply that the RBL model is an effective pedagogy for students' research skills, especially in language learning. The findings of this study also highlight the need for structured syntax trajectory and learning when implementing the RBL model. In turn, further evaluation is needed to see if this model can fulfill the research skills indicators. Therefore, for better implementation, future research suggests that long-term syntax models have an impact on research in the learning context.

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