

Ontology, Epistemology, and Axiology of *Project-Based Learning*

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Abstract: Considering ontology, epistemology, and axiology in planning and implementing project-based learning is important. This helps to ensure that projects are undertaken with a clear understanding of the objects studied, the methods used, and relevant value considerations. Using theoretical studies, ontology, epistemology, and axiology are applied to project-based learning in senior high schools for Indonesian language lessons.

Keywords: ontology, epistemology, axiology, learning, project.

Abbreviations: PjBL is a Project-Based Learning

Introduction

The use of the Project-Based Learning (PjBL) model provides new experiences and knowledge for students because they indirectly learn to be scientists, take scientific action in carrying out a project, starting from formulating problems, determining procedures, determining the tools and materials needed, conducting investigations, designing and creating products, presenting or communicating products as a result of the investigation process, and conducting group discussions, (Hidayati, 2022). Language as a means of communication has two ways of delivery, namely oral and written. Unlike thinking skills which have one logical element, language skills have two elements, namely logical and linguistic elements (Miranti, 2021). Indonesian language learning teaches four aspects of language skills. The four skills are listening, speaking, reading, and writing. In addition to the four aspects of language skills, it also studies the sciences of language (linguistics) such as phonology, morphology, syntax, discourse, semantics, sociolinguistics, pragmatics, etc. In addition, it also studies

Indonesian literature, as a form of product and understands the world of Indonesian language education. Literary works are also called personal expressions of a person. The expression can be in the form of feelings, experiences, desires, ideas, and the solemnity of a picture of life that evokes the charm of language depicted in ink strokes (Ningrum, 2022).

One form of Indonesian Language learning approach that makes products is called project-based learning. It is important to consider ontology, epistemology, and axiology in planning and implementing project-based learning. This helps to ensure that the project is undertaken with a clear understanding of the object being studied, the methods being used, and relevant ethical considerations. It can also help in avoiding potential problems and conflicts that may arise during the project process. Ontology, epistemology, and axiology are three philosophical concepts that can be applied in the context of project-based learning.

Materials and Methods

Study Area

Ontology

Cristian Wolff (1679-1714) is a famous figure who coined the term ontology. The term ontology comes from the Greek, where *ta onta* means "that which is", and *logos* means "science or teaching". In other words, ontology is the science that seeks essence and existence. Ontology is part of Metaphysics.

Ontology is concerned with the understanding of what exists or reality in this world. In the context of project-based learning, the ontology may refer to the understanding of the object or entity being studied. What is considered an "object" or "entity" in project-based learning? For example, in an Indonesian language learning project, the ontology may refer to an understanding of the types of data, features, variables and classes that will be used in the Indonesian language learning model. These are ontological questions that need to be answered before starting project-based learning.

Thus, ontology is a philosophical study and wants to answer what objects are studied by science? How is the ultimate form of the object? How does the object relate to the human capacity (thinking, feeling, and sensing) that produces knowledge? (Suriasumantri, 2000).

Epistemology

In terms of the meaning of the word, epistemology has Greek roots, namely *episteme* which means "knowledge or science", and *logos* which also means "science or teaching". So, epistemology means the science of knowledge which is often called 'theory of knowledge'. The central issue of epistemology is the question of what we can know and how to know it.

Language is a system arranged in the form of sound symbols that are used to express feelings and thoughts. People use language to cooperate, socialize, and communicate with others through speech, and gestures, both oral or written. The nature of language is discussed as the material object of the philosophy of language.

Epistemology deals with the source of knowledge and how we understand the world. In

project-based learning, epistemology will concern how we gain knowledge about the data and concepts related to the project. How is the data collected? How do we understand and interpret the data? Do we use statistical methods, game learning, or other approaches? The determination of epistemology will affect the approach to data analysis and model building in project-based learning.

In detail, the scope of epistemology is stated by Suriasumantri (2000): How is the process that makes it possible to gain knowledge in the form of science? How is the procedure? What things must be considered so that we get the right knowledge? What is truth, and what are its criteria? What methods, techniques and means help us to gain knowledge in the form of science?

Axiology

Etymologically, the word axiology comes from the Greek language which consists of two words, namely *axios* which means "worthy or suitable" and *logos* which means "science or teaching". In addition, value comes from the Latin word *Valere* meaning useful, capable, strong, valuable, which means the quality of something that makes it loved, desired or an object of interest. But it can also mean what is valued, highly valued, or appreciated as good.

Axiology deals with values, ethics, and norms in the context of the project. It involves questions about why we are doing the project, what values it should uphold, and the social or ethical impact of the project. In project-based learning, axiology may refer to ethical considerations in the use of data and models. For example, does this project involve personal data? How will this data be used? How do we maintain data privacy and security? Axiology can also relate to consideration of the business or social values underlying the project, as well as its impact on society or the environment.

Indeed, according to the background of its formation: why and for what knowledge exists, the answer is in the hands of humans. The design of scientific theories built technology is made based on theories of scientific truth, solely for the empowerment of the values of scientific truth,

namely the benefits for the continuity of life and the achievement of life goals (Suhartono, 2008).

approach in 2021-2023 with the help of the *Publish or Perish 8* application.

Methods

This research uses a qualitative literature study. Some of the research results included in this article are summarized from documents related to Indonesian language learning through the PjBL

Results and Discuccion

Some of the research results included in this article are.

Table 1. Summarized of research journal

No.	Researcher and year	Title and Journal	Research Methods and Results
1.	Mimi Sri Irfadila , Megasari Martin , Sarah Samosir , Indah Wulandari (2021)	Implementasi Pembelajaran Berbasis Proyek Pada Pembelajaran Bahasa Indonesia di SMA Muhammadiyah Padangpanjang (Indonesian Journal Of Educational Development Volume 2 Nomor 1, Mei 2021)	In this case, ontology refers to the object in PjBL which refers to the variable class X SMA Muhammadiyah Padangpanjang with hikayat material. With the form of epistemology that refers to Indonesian language learning with aspects of student creativity. At this stage it is necessary to explain project tasks and working drawings, group students according to their respective tasks, and work on projects. The preparation of learning resources includes determining teaching materials, relevant examples, and triggering questions to be asked in the learning process. Explanation of the project tasks carried out by students as well as the determination of the project implementation schedule. The project task that students will do is in the form of making a short story based on the values and structure contained in the Hikayat. The project is carried out in groups. While from the form of axiology, the implementation of the PjBL model affects the creativity and expression of students' opinions. Although, the PjBL model has not had a positive influence on the knowledge aspects and student learning outcomes. From this study, it was found that there are still other variables that affect the success of the implementation of project-based learning models that need to be explored more deeply.
2.	Lathoiful Minan; Sabar Narimo	Penerapan Model Pembelajaran Berbasis Proyek Pada Kurikulum Merdeka Untuk Meningkatkan Keaktifan Siswa Di Fase E (Kelas Sepuluh) SMA Negeri 1 Pamotan (Repository skripsi UMS, 2023).	Ontology also discusses what is to be known, (Suriasumantri, 1985). In this article, it is explained that the purpose of this research is to increase the activeness of project-based learning in the independent curriculum in phase E (tenth grade) of SMA Negeri 1 Pamotan. While the epistemology, the use of scientific methods of classroom action research to obtain the source of research knowledge. The emergence of axiology is characterized by the value of activeness, creativity, cooperation in groups. Students show discipline, willingness to learn, the work produced, and the spirit of independent learning.
3.	Suci Dwi Lestari, (2023).	Penggunaan Pembelajaran Berbasis Proyek untuk Meningkatkan Keterampilan Berbicara Siswa Kelas XI SMA N 1 Palasa (dalam Repository Universitas	Epistemology uses a quasi-experimental design method with variables of XI grade students of SMA Negeri 1 Palasa, XI IPA 3 as the experimental group and XI IPA 1 as the control group as the form of ontology. The sample was selected using purposive sampling technique. Data were collected through pre-test and post-test then analyzed by t-test to compare the average scores of pre-test and post-test of experimental and control groups. Axiology is shown by the absence of a significant difference in the mean score of the pre-test in the control group and the experimental group, the average score of students is 35.26 and 34.92. Data analysis showed no significant difference in mean scores on the post-test between the

		Tadulako) Februari 2023.	1	control group and the experimental group, the mean scores were 41.67 and 45.23. Although, there was an increase between the mean value of the pre-test and the mean value of the post-test of the experimental group, it was not a significant increase. Further analysis showed that the t-count (1.104) was lower than the t-table (1.67). It was concluded that PjBL could not improve students' speaking ability in class XI SMA Negeri 1 Palasa.
4.	Hotnauli Simbolon, Tutiariani Nasution, Marini.	Resmi, Netti		Model Pembelajaran Berbasis Proyek Dengan Penggunaan Aplikasi <i>Noveltoon</i> Terhadap Kemampuan Menulis Naskah Drama Jurnal Komunitas Bahasa, Vol 10, No. 2 (2022). Ontology in the form of variables writing drama script class XI SMA Taman Siswa Pematangsiantar, and the use of quantitative methods of simple experimental design experiments as a form of epistemology in obtaining sources of knowledge. So, the research results obtained with the value (axiology) H_a is accepted and H_o is rejected, which means that there is an effect of the PjBL model with the use of the <i>noveltoon</i> application on the ability to write drama scripts in class XI SMA Taman Siswa Pematangsiantar.
5.	RIZKI PERKASA, (2022)	DWI		Pengembangan Modul Teks Anekdote Dengan Pendekatan Pembelajaran Berbasis Proyek (Project Based Learning) Pada Siswa Kelas X SMA/SMK. (Repsitory UNJ 2022, Tesis). The ontology of this research aims to determine the development of a module with the PjBL model in classroom learning. The module developed is an anecdote text module with the ADDIE (Analysis, Design, Development, Implementation, and Evaluation) method as a form of epistemology. It started with analyzing the needs of teachers and students and produced a statement that teachers are interested in modules that are practical and have well-structured learning steps. Teachers will also be facilitated if there is a module that can help students independently in understanding Indonesian language learning, especially anecdotal text. From the results of the evaluation of the values used, it is concluded that the anecdote text module with the PjBL model is suitable for use in the teaching and learning process (axiology).
6.	Saksi (2021)	Tarigan		Meningkatkan Keterampilan Berbahasa Indonesia Siswa Melalui Penerapan Model Pembelajaran Berbasis Proyek dalam <i>Indonesian Journal of Educational Development</i> Volume 2 Nomor 1, Mei 2021 Using PTK, the students' Indonesian PjBL model was designed to improve students' language skills on the material of observation report (epistemology). This PTK was carried out in class XMIPA-2 (32 students) SMA Negeri 1 Kabanjahe from September 2019 to November 2019 and took place in two cycles (ontology). The results (axiology) showed: 1) in cycle I, it was shown that the average students' Indonesian language skills increased with a classical learning completeness of 46.88% and in cycle II, it showed an average of 89 with a classical completeness of 90.63% or an increase of 44%; 2) student learning activities increased in cycle I, including reading and writing 37%, working on LKS 32%, asking fellow friends 21%, asking the teacher 5%, and those irrelevant to teaching and learning activities 5%. Meanwhile, according to observations in Cycle II, including reading and writing 32%, working on worksheets 35%, asking fellow friends 21%, asking the teacher 9%, and those that are not relevant to teaching and learning activities 3%. So, the application of PjBL is stated to be able to improve Indonesian language skills and student learning activities in two cycles.
7.	Yuniarti, Haryadi, Nas Haryati.			<i>Project Based Learning Sebagai Model Pembelajaran Teks</i> Ontology is obtained with the aim of applying a learning model that emphasizes high-level thinking skills in learning Indonesian language anecdote text material by describing learning steps for high school students.

<p><i>Anekdota pada Siswa SMA dalam Jurnal Pendidikan Bahasa Indonesia</i> Vol 9, No 2 (2021)</p>	<p>Epistemology is carried out with descriptive methods with qualitative analysis used in this study. There is an explanation of the implications of the learning model on anecdotal text material using descriptive methods. The conclusion of the analysis results in the application of the PjBL model in Indonesian language learning can be seen through the value (axiology) of activities; (1) solving problems, (2) involving students in designing concrete products, (3) designing long-term activities, (4) teachers monitor students in solving problems related to projects, (5) students focus on solving problems related to projects, (6) students produce an anecdote text as a learning product by familiarizing students to reach the C6 cognitive level, namely creating to evaluating learning experiences.</p>
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The PjBL learning approach places students at the center of the educational process. The principles of PjBL, drawn from other contemporary educational principles including constructivism learning theory, emphasize on students and their autonomy in the learning process. During PjBL learning, teachers guide students toward the knowledge they seek or the knowledge required to complete the project. Therefore, PjBL requires a meaningful learning process by designing structured learning to produce products that can be used, inspire action, and fortify basic life skills (Hidayati, 2022).

Project-based learning or PjBL for short is a learning method that focuses on projects or product tasks designed to solve real-world problems and achieve concrete results. In integrating Indonesian language learning through PjBL, several steps can be taken, namely: Identification of educational objectives, selection of project topics, research and analysis, creativity and collaboration, presentation and evaluation, reflection, and connecting with scientific truths.

Identify educational objectives. This first step determines the learning objectives to be achieved in Indonesian language lessons. These can include developing speaking, writing, reading, and listening skills in Indonesian, as well as understanding and respecting the cultural and social values associated with the language.

Selection of project topic. Selection of a project topic that is relevant to Indonesian language learning and consistent with the learning objectives. For example, a project might focus on writing a drama text, writing an essay, researching Indonesian literature, preparing an artwork in

Indonesian, or developing a communication campaign in Indonesian.

Research and analysis. An integral part of PjBL is researching to gather the information needed to complete the project. In the context of language learning, this can include the study of grammar, vocabulary, language use in social contexts, and so on.

Creativity and Collaboration. PjBL certainly encourages students to collaborate, think creatively, and integrate various scientific aspects in their projects. Students can design products or works that demonstrate a deep understanding of Indonesian and incorporate creative elements in language and culture and problem-solving.

Presentation and Evaluation. Projects should include a presentation stage, where students present their results in Indonesian. This can involve essay writing, oral presentations, artwork, or other media. Teachers can evaluate students' ability to use Indonesian correctly and effectively, as well as their understanding of the project topic.

Reflection. Students need to be allowed to reflect on their learning process and project outcomes. This allows them to learn from their experience and improve their Indonesian language skills.

Connecting with scientific truth. Throughout the PjBL process, teachers can help students connect language learning to scientific truths and existing knowledge in language and literature disciplines. This can include discussions on language structure, literary research, language history, and other relevant aspects.

By integrating PjBL in Indonesian language learning, students not only develop language skills, but also apply linguistics in real contexts, promote

cultural understanding, and enhance their understanding of scientific thrusts in Indonesian language and literature.

Discussion

From the discussion, it is concluded that the implementation of the ontology, epistemology, and axiology of PjBL in Indonesian language learning is obtained that (1) PjBL has been introduced as the development of school teaching materials in various materials in high school, (2) PjBL has been researched and sought the effect of PjBL application on content understanding, language skills, learning methods, and attitudes, (3) PjBL is proven to have an influence and improvement in the Indonesian language learning process. Increased teacher competence and subject teacher initiative are needed to increase student motivation and enrich knowledge. PjBL research in Indonesian education has increased significantly in recent years.

Conclusions

Some articles found that the PjBL approach can also be implemented with other approaches such as bilingual teaching, collaborative learning, task-based learning, and text genre-based learning. This is in line with Anwar (2023), the concept of Project Based Learning provides a great opportunity for children to explore, develop thinking and work together. In designing Project Based Learning (PjBL) teachers need to plan by choosing a topic and identifying the availability of various resources needed. In addition, teachers also need to prepare some open-ended questions to stimulate children in conducting investigations. With the PjBL training program, it is hoped that teacher competence can increase so that teachers can become more creative, innovative and implement any new knowledge gained in the learning process at school. Of course, this will also bring many benefits to students by continuing to prioritize learning principles that are more fun and meaningful.

Conflict of Interest: Hereby, I declare having no financial, commercial, legal, or professional relationship with other organizations, or with the person with whom they work, which could affect this research.

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