Analysis of Database Development Needs for the PjBL Model Application System Integrated with NTT Local Wisdom in Chemistry Learning

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Abstract. The research aims to analyze the needs of teachers and students regarding their perceptions, experiences, and obstacles in implementing the PjBL model, integrating NTT local wisdom, and utilizing information technology. A purposive sampling technique was employed involving 5 chemistry teachers and 100 students from 5 schools in cities and regencies in NTT. Data were collected through teacher interviews and a 5-scale Likert questionnaire administered to teachers and students. The questionnaire data were analyzed using descriptive quantitative methods, while the Miles and Huberman model was employed to analyze qualitative data from interviews. The research findings indicate that teachers have a low percentage of positive responses regarding the experience of developing assessment instruments and implementing the PjBL model, as well as identifying NTT local wisdom to be related to chemistry material. Specifically, 20% of teachers strongly disagreed, and 51.33% were neutral. The interview results support the questionnaire findings. Moreover, analysis of student questionnaires revealed that they agreed with a percentage of >67.6% for all indicator statements supporting the development of a database of themes and project assessment aspects based on NTT local wisdom for the application of the PjBL model.

Keywords: Needs analysis, PjBL model application, NTT local wisdom, SMA chemistry.

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1 Introduction

The Indonesian government is continuously refining the curriculum to ensure its relevance across various levels of education. This adjustment is necessary to align with current developments and adapt to the evolving demands of knowledge and skills required by students. Crucially, the curriculum must prioritize the active involvement of students in the learning process (Amanulloh & Wasila, 2024). The Merdeka Curriculum or *Kurikulum Merdeka* (KM), introduced in 2021, is the latest curriculum implemented in Indonesia, particularly by schools selected for the driving school program. This program aims to facilitate a selection stage for schools to meet national administrative requirements for implementing KM in stages. Moreover, in 2024, will be standardized as a national curriculum. One of the key priorities for implementing KM is the integration of the PjBL model into teaching and learning activities (Nursalam et al., 2023).

The PjBL model requires the application of aspects of the knowledge taught to solve problems in everyday life. Thus, qualified scientific skills are needed on the part of students. Scientific skills have been required in the process standards in the curriculum implemented before KM was implemented, namely Curriculum 2013 (K13). In K13 it is referred to as a scientific approach, which is actually a basic requirement in implementing learning that applies the PjBL model (Yuniarti et al., 2018).

The teacher's role in PjBL model-based learning activities is multifaceted. They must provide clear instructions to students, guide and motivate them throughout the project stages, and conduct assessments from the outset to the conclusion of the investigation project. At the initial stage of the learning process, determining a project theme using the PjBL model should enable students to identify problems that can connect new ideas with relevant prior knowledge (Delostrico, 2019). Despite numerous studies and research efforts, persistent issues in the learning process remain. Students are often encouraged to develop thinking skills but are instead forced to memorize information and apply it in everyday life, leading to a lack of skills to apply the knowledge they have acquired (Sudibyo et al., 2017). Therefore, it is crucial to identify the use of the PjBL model in schools in NTT, encompassing the roles of teachers and students, obstacles faced, experiences, and perceptions regarding its application in chemistry subjects.

Research has been conducted in several high schools across cities and districts in NTT to observe the implementation of learning models and approaches that meet process standards in the 2013 curriculum (K13). The results of these studies vary. For instance, a private high school in Kupang City has implemented a learning approach and model with stages of analyzing, evaluating, questioning, confirming, and validating learning concepts, which aligns with process standards but does not incorporate the PjBL model (Polli et al., 2022). Initial observations before conducting research in one high school in a district of NTT revealed that K13 learning activities were still dominated by the lecture method, leading to students being passive and unmotivated in learning chemistry. This indicates that even though K13 has been implemented, learning remains conventional and does not comply with process standards (Kuniati et al., 2024). Another study found that the chemistry learning process at a high school in Kupang City had not yet integrated the practicum process, showing that the learning process did not meet process standards (Ramen et al., 2022). These observations underscore the need for further study to measure the level of PjBL model implementation in high school chemistry subjects in NTT cities and districts.

Chemistry, a field of study taught in high school, requires a scientific approach, which is integral to science learning (Subagia, 2014). Maximizing the chemistry learning process involves integrating local wisdom and using the PjBL model, which necessitates a scientific approach. Utilizing local resources adds value because students can train themselves and become sensitive to their environment. Teachers play a crucial role in assessing various aspects of knowledge and skills in learning (Ni'mah et al., 2023).

Local wisdom, passed down through generations, is a valuable guide for human behavior in ecological community life and should be integrated into the learning process. This allows students to interact directly and explore the knowledge (science) contained in that culture (Harisanti, 2019). Local wisdom can be integrated in various forms, such as food, medicine, production systems, clothing, social relations, and housing (Badriah & Sukati, 2021). East Nusa Tenggara (NTT) is an island province with diverse cultures and local wisdom that can be identified and applied in the learning process. This integration process begins by identifying the interconnectedness of material characteristics in chemistry subjects and local wisdom in a particular area.

Research has studied chemistry in the local wisdom of Sikka district, NTT, describing the local wisdom in ikat weaving, which involves the use of cotton, local materials, and natural adhesives (Sulyistyaningsih et al., 2024). This highlights the close connection between local wisdom and aspects of chemistry, making it possible to apply in the PjBL model. Integrating local wisdom in the PjBL model involves preparation, starting from identifying chemical material characteristics, local wisdom characteristics, studying their relationships, and determining learning themes. Teachers must prepare instruments for various aspects of assessment at each project stage, which requires significant time. Therefore, it is necessary to use information technology specifically developed to facilitate the implementation of the local wisdom-based PjBL model in learning activities.

Rapid developments in the field of education necessitate the integration of information technology into the learning process. Today, online and internet-based technologies have become essential sources of information that both teachers and students must master (Surbakti, 2014). This research presents a needs analysis aimed at developing a PjBL system application based on local wisdom from NTT for high school chemistry learning. While numerous studies have explored the application of the PjBL model through local wisdom and digital learning media, there has yet to be research focused on developing a PjBL model system specifically tailored to local NTT wisdom for chemistry subjects. This gap highlights the novelty of the current study.Needs analysis serves as the initial stage in the ADDIE Model of development research (R&D), which is widely used due to its systematic approach to instructional development. The ADDIE model consists of five stages: needs analysis, development, implementation, and evaluation (Sugihartini & Yudiana, 2018).

The purpose of this needs analysis is to gather information and identify the specific needs of the research subjects. By understanding the gap between the desired outcomes and the current conditions, the developed product can be tailored to meet the identified needs (Tambunan, 2021). The central question guiding this needs analysis is: What are the perceptions of high school teachers and students regarding their experiences and obstacles in using information system applications, the PjBL model, and the integration of local wisdom in chemistry learning? Therefore, the aim of this research is to examine these perceptions and identify the challenges faced by teachers and students in implementing these educational strategies.

2 Method

2.1 General Overview

This research employs a mixed methods approach, which combines various techniques (qualitative and/or quantitative) for data collection and analysis within a single research design. This method has evolved into a well-established empirical branch as a social research methodology (Knappertsbusch et al., 2021). Therefore, this study employs both qualitative and quantitative descriptive methods to produce conclusions in the needs analysis stage, which is the initial phase of development research using the ADDIE model. Data collection techniques include interviews and questionnaires.

2.2 Research Instrument

The instruments used to gather data on the perceptions of teachers and high school students regarding their experiences and obstacles in using information system applications, the PjBL model, and the integration of local wisdom in chemistry learning are a needs analysis questionnaire and a structured needs analysis interview protocol. The indicators used to develop the student questionnaires are related to perceptions, experiences, motivation, and the need for implementing the PjBL model, using information system applications, and integrating local wisdom in chemistry learning.

Table 1. Student Instrument Grid for Needs Analysis

No	Indicator	Statement Number
1	Experience in learning about aspects of the PjBL model	1, 2, 3, 4, 5, 6, 7
2	Experience in learning about NTT local wisdom	8, 9, 10
3	Experience in learning about Information technology	19, 22, 23, 24, 25
4	Perceptions about aspects of the PjBL model with the integrationof NTT local wisdom	11, 16, 26
5	Perceptions about Information technology	18, 20, 21
6	Motivation, interest and creativity in learning related to aspects ofthe PjBL model, NTT local wisdom and Information Technology	12, 13, 14, 15,17

The teacher questionnaire instrument and structured interview protocol were developed with a focus on their relevance to the curriculum, incorporating indicators adapted from previous research. These indicators include knowledge, teaching skill level, self-confidence in teaching, frequency of attending science courses, teaching load, learning preparation, and the application of technology (Ghazali et al., 2024).

Table 2. Structured Teacher Interview Protocol Needs Analysis Instrument Grid

No	Indicator	Question Number
1	Types of local wisdom from each region that can be applied inchemistry learning	1
2	Self confidence	3
3	Frequency of Attending Science and Technology Training	4, 5
4	Implementation of the PjBl Model	6, 2
5	Application of information technology in chemistry learning	7

Table 3. Teacher Questionnaire Instrument Grid for Needs Analysis

No	Indicator	Statement Number
1	Relevance of the curriculum to the research to be conducted(Local Wisdom, PjBL Model, information technology applications)	1, 5, 15
2	Important related knowledge (Local Wisdom, PjBL Model,information technology applications)	3, 4, 16, 13
3	Confidence in learning	14
4	Teaching Load	11,12
5	Learning Preparation	9
6	Application of Technology in learning	18,19, 20
7	Understanding, experience, skills in the integration of local wisdom, and implementation mechanisms, assessment in the PjBL model.	2, 6, 7, 10, 8, 17

Before data collection, construction and theoretical validation are carried out by experts in the field of development. The objective is to determine the suitability of instrument items in capturing data according to needs. This research employed two expert validators in the field of chemistry education. Both validators have extensive experience teaching pedagogical courses for over 30 years and are currently active in research and community service in education at regional and national levels. The validation results indicate that the two questionnaires are suitable for use, aligning with previously determined indicators.

Empirical validity was conducted to determine the reliability of this instrument in collecting data. The student questionnaire instrument uses the split half method validity measurement technique with the Spearman-Brown formula, while the teacher questionnaire employs the test-retest method. These two instruments were tested for composite reliability using the Alpha Cronbach formula (Retnawati, 2017). The test results for the teacher questionnaire yielded validity values of 1.0 and a reliability of 0.999, while the student questionnaire was tested on 20 students at one of the high schools in East Sumba district. The analysis results obtained a validity value of 0.999 and a reliability of 1.899. This demonstrates that these two questionnaire instruments are reliable for use in collecting data.

2.3 Data Analysis

The data analysis technique for the questionnaire uses the percentage formula, and the measurement scale used is the Likert scale. The scale percentage is then interpreted using the following criteria:
0% to 20%: Strongly Disagree (SD)
21% to 40%: Disagree (D)
41% to 60%: Neutral (N)
61% to 80%: Agree (A)
81% to 100%: Strongly agree (SD).
Meanwhile, interview data were analyzed using the Miles and Huberman analysis model, which involves the following stages: data collection, reduction, display, and conclusion (Badriah & Sukati, 2021). The questionnaires were distributed via Google Forms, while interviews were conducted either in person or through Zoom.

2.4 Participant Selection

The sampling technique used in this research is purposive sampling, which involves selecting participants based on specific criteria that align with the research objectives. This method is non-random and focuses on obtaining a representative sample from targeted views (Lenaini, 2021). In this study, the sample consisted of five high school chemistry teachers from five different schools across cities and districts in NTT. For the student participants, 20 students each were selected from classes XI and XII Science at these five schools. The choice to include students from these grades was made because they already have experience with the high school chemistry learning process. Thus, the total number of student research subjects in this study was 100. The selected locations include Kupang City, South Central East Regency (TTS), North Central East (TTU), Belu, and Rote Ndao. This sampling strategy was designed to capture the diversity of local wisdom in NTT, as it encompasses various cities and districts, allowing for a comprehensive identification of local cultural insights.

3 Results and Discussion

3.1 High school teacher' perceptions about experiences and obstacles in using information system applications, the PjBl model, and the integration of local wisdom in chemistry learning

To gather research data related to the analysis of teachers' perceived needs, two main instruments were employed. The results of the data analysis from the teacher needs analysis questionnaire instrument can be found in Table 4.

Table 4. Results of Questionnaire Data Analysis Needs Analysis Teacher Perceptions Regarding Experience, Obstacles in Using Information System Applications, PjBL Models, and Integration of Local Wisdom in Chemistry Learning

Indicator Number	Statement Number	% Statement	% Indicator	Interpretation Description
1	1	92	90.66	Strongly agree
	5	88		
	15	92		
2	3	96	92	Strongly agree
	4	96		
	13	88		
	16	88		
3	14	92	92	Strongly agree
4	11	36	28	Don't agree
	12	20		
5	9	20	20	Strongly Disagree
6	18	72	82.67	Strongly agree
	19	88		
	20	88		
7	2	56	51.33	Neutral
	6	56		
	7	56		
	8	60		
	10	40		
	17	40		

Based on the data analysis in Table 4, several key findings can be discussed: **First,** relevance of Information Technology and Local Wisdom: The application of information technology, the PjBL model, and local wisdom in NTT is highly relevant to current curriculum demands, with 90.66% of respondents strongly agreeing.

Second, Enhancing Student Motivation: Implementing the PjBL model based on local wisdom with the aid of information technology applications fosters students' interest and motivation. However, teachers need additional skills in explaining material, guiding small group discussions, and managing the class, supported by 92% of respondents strongly agreeing.

Third, Teacher Confidence and Skills: Teachers' confidence in the learning process requires qualified teaching skills, learning preparation, and maximum assessment processes. The availability of a PjBL model system application based on local wisdom addresses teachers' needs in growing self-confidence, supported by 92% of respondents strongly agreeing.

Fourth, Obstacles in Implementation: Teachers face obstacles related to time allocation in chemistry learning, which is not feasible, and not having enough time to

prepare teaching materials and assess student outcomes. This is supported by 28% of respondents disagreeing with positive statements.

Fifth, Assessment Challenges: Teachers have not developed assessment instruments for each stage of the PjBL model and have not used them to assess student learning outcomes, supported by 20% of respondents strongly disagreeing with positive statements.

Sixth, Adapting Technology: Teachers find it easy to adapt the use of information technology-based applications in learning. Using these applications, the PjBL model based on local wisdom can be applied in the chemistry learning process, supported by 82.67% of respondents strongly agreeing.

Understanding Local Wisdom: Teachers have identified the relationship between local wisdom and chemical material characteristics but have not maximized it and have not explored the specific relationship for application in the chemistry learning process. Additionally, they do not fully understand the stages and assessments needed in implementing the PjBL model, and the use of information technology to support the learning process is not optimal, supported by 51.33% of respondents being neutral.

Table 5. Data from Interview Results Analysis of Teachers' Perceptions of Needs Regarding Experience, Obstacles in Using Information System Applications, PjBL Models, and Integration of Local Wisdom in Chemistry Learning

Number Indicator	Number Statement	Question	Answer
1	1	What local wisdom do you think needs to be studied and linked to chemical aspects? (includes local wisdom according to the area of origin/school location)	Respondents from TTU: Making pure coconut oil, Making tua nakaf (Sopi), Making Woven Cloth, Respondent from Kupang City: local NTT food processing, process of making ikat cloth Original respondent Rote Ndao: buffalo milk processing, Rote vinegar and soy sauce manufacturing process from lontar sap, dyeing, ikat woven fabric, Respondents from Belu served betel nut andlime at Belu traditional events, used natural materials in coloring Belu ikat weaving, Respondents from TTS used natural materialsfrom TTS in making soap, perfume and dyes in TTS ikat weaving.
2	3	What things make you lack confidence	Lack of preparation in learning, lack of understanding of the material, very

		in the learning process?	limited time allocation and not appropriate to students' conditions, lack of mastery of the steps the right step in learning.
3	4	Have you ever followed? workshops/training related to improving the quality of the chemistry learning process	Have attended training related to improving learning in general but have never attended anything specifically for chemistry learning
	5	Have attended workshops/training related to the use of information systems in the learning process	Often attends training related to the use of information systems in the learning process in general but has never attended anything specifically for the use of certain applications inchemistry learning
4	2	Have you ever used the PjBL model in carrying out the chemistry learning process? State the obstacles faced.	Persistent but constrained Insufficient time allocation so that the PjBL model stage is not completely implemented, Students are accustomed to obtaining information from primary sources, namelyteachers, Difficult to invite students to the problem solving process, Students are reluctant to try to solve problems that they think are not too difficult, especially those that are difficult in learning, Not all materials have characteristics that aresuitable for application with the PjBl model Initial knowledge as a requirement for project implementation has not been mastered well by students, Teachers do not really understand the assessment process in the PjBL model so it is difficult to develop instruments

			and carry out these assessments.
	6	What obstacles are encountered inusing informationtechnology applications inchemistry learning?	Lack of knowledge, and not knowing the applications of information technology that are relevant to chemistry learning
5	7	What information technology iscommonly applied its use in thechemistry learningprocess	Internet to search for references relevant to chemical material, material files, material explanation videos, animated videos to explain chemical material, use the Chemdraw application program to make it easier to write chemical reaction equations, and structural formulas for chemical compounds

Based on the data gathered from the teacher needs analysis interviews, two main points can be drawn:

First, In-Depth Exploration of Local Wisdom: There is a need for a more in-depth identification of the characteristics of local wisdom related to the ikat weaving process. All five teachers expressed a shared perception that the ikat weaving process in Kupang City and the four surrounding districts has distinct characteristics that can be linked to specific chemical materials. Therefore, when developing the database and application for the PjBL model system based on local wisdom, it is essential to prioritize the ikat weaving process. This focus will help in developing the PjBL model application system, which can then be tested on the same sample.

Second, Teacher Self-Confidence and Training: The interviews revealed important insights regarding teacher self-confidence in the learning process, the frequency of attending training related to the quality of chemistry and information technology education, as well as the obstacles and experiences faced in implementing the PjBL model. These findings strongly support the data obtained through the questionnaire, highlighting the significance of ongoing professional development and training in enhancing teachers' confidence and effectiveness in using the PjBL model and information technology in their teaching.

3.2 High school Students' perceptions about experiences and obstacles in using information system applications, the PjBl model, and the integration of local wisdom in chemistry learning

Table 6. Results of Questionnaire Data Analysis Analysis of Students' Needs Regarding Perception,Experience, Motivation, Interest and Creativity in Using Information System Applications, PjBL Models, and Integration of Local Wisdom in Chemistry Learning

Indicator	Number	% Each Statement	Interpretation Description	% Each Indicator	Information Interpretation

Experience in learning about Aspects of the PjBL model,	1	72,2	Agree	75,4	Agree
	2	77,8	Agree		
	3	79	Agree		
	4	78,8	Agree		
	5	72,2	Agree		
	6	69	Agree		
	7	78,8	Agree		
Experience in learning about NTT local wisdom,	8	71,2	Agree	69,06	Agree
	9	67,6	Agree		
	10	68,4	Agree		
Experience in learning about Informationtechnology	19	74,2	Agree	75,88	Agree
	22	77,8	Agree		
	23	75,8	Agree		
	24	82,4	Strongly agree		
	25	69,2	Agree		
Perceptions about aspects of the PjBL model with the integration of NTT local wisdom	11	69	Agree	73,53	Agree
	16	75,4	Agree		
	26	76,2	Agree		
Perceptions about Information technology	18	83	Strongly agree	80,66	Strongly agree
	20	81,2	Strongly agree		
	21	77,8	Agree		
Motivation, interestand creativity in learning related to aspects of the PjBL model, NTT local wisdom, information technology	12	75,8	Agree	75,08	Agree
	13	72,6	Agree		
	14	78,4	Agree		
	15	74,6	Agree		
	17	74	Agree		

Based on the data analysis results presented in Table 6, several key points can be discussed:

First, Student Agreement on Learning Experiences: A significant majority of students (75.4%) agreed on several aspects of their chemistry learning experiences. They reported that they had encountered general themes that allowed them to identify and solve problems using scientific procedures. Additionally, students indicated that they had experience working in groups to study and find solutions to everyday problems related to chemical concepts. They also acknowledged that their teachers guided them through the stages of problem-solving, including planning, design, implementation, and reporting—key components of the PjBL model. Furthermore, students expressed that they were directed to produce specific products as solutions to the problems raised during lessons, and they recognized that the planning, implementation, and reporting processes were thoroughly assessed by their teachers. These five statements reflect the

stages of the PjBL model, which involve formulating fundamental questions, planning and executing projects, and presenting product representations derived from problem-solving efforts (Susilaningsih et al., 2018).

In addition, the findings from the data analysis on students' experiences in PjBL model-based teaching and learning activities contradict the results of teacher interviews and responses on the implementation and assessment of the PjBL model in the learning process. This discrepancy suggests that the students involved in this research, who come from classes XI and XII, have undergone teaching and learning activities during the implementation of both the 2013 curriculum and the independent curriculum. The 2013 curriculum mandates a scientific approach as a minimum process standard in teaching and learning activities, which includes collaboration in groups (Suciana & Ellizar, 2019). When students participate in learning activities that incorporate a scientific approach or other models and approaches, they may perceive that the steps of the PjBL model have been implemented. However, this perception may not accurately reflect the academic rigor and challenge that the PjBL model entails. Students need to use their critical thinking to dominate the standard content of a lesson, and the PjBL model involves them in designing and producing products that meet the principles of authenticity (Yusof et al., 2015).

Second, Understanding Local Wisdom: Regarding the indicator of experience with NTT local wisdom, students expressed agreement at a rate of 69.06%. They acknowledged that their teachers had introduced local wisdom relevant to chemical concepts, taught the connections between NTT local wisdom and chemical concepts in detail, and provided structured assignments related to local wisdom and chemical materials. However, this finding contrasts with the analysis of teacher interviews and questionnaires on the same indicators. The implementation of the independent curriculum in these schools includes a program to strengthen the Pancasila student profile (P5), which studies local NTT wisdom and influences students' perceptions regarding these statements (Kemendikbudristek RI, 2023).

Third, Experience with Information Technology: The indicator measuring students' experiences in using information technology for chemistry learning received a positive response rate of 75.88%. Students agreed that they utilized various learning resources, such as educational videos from social media, and engaged in interactions through platforms like WhatsApp and Zoom. These findings were corroborated by teacher interviews and observations, which indicated that students were able to interact online by completing Google Form links distributed during lessons. However, further investigation is needed regarding students' understanding of learning system applications, as their responses seem to contradict the findings from teacher research.

Fourth, the perception indicator regarding aspects of the PjBL model with the integration of NTT local wisdom obtained an average percentage of respondents at 73.53% (agree). This suggests that students agree with the statement that they understand local wisdom as cultural heritage because they studied it through chemistry subjects. This finding highlights the need for further measurement not only through self-assessment but also through other methods. Students also agree that local wisdom that can be applied in chemistry learning is an aspect of the process of making NTT ikat weaving, which is very useful. This aligns with research by Lalang et al. (2023), which states that the integration of local wisdom in the chemistry learning process can lead to positive results by improving student learning outcomes.

Fifth, indicators of students' perceptions about information technology in chemistry learning obtained a percentage of respondents at 80.66% (strongly agree). This indicates that students strongly agree that the use of information systems in chemistry learning is important, as it helps them familiarize themselves with the rapid development of technology and assists in working on assignments that require references from various learning sources that are not physically available. This finding is consistent with research by Gayatri et al. (2015), which shows that teenagers aged 10 to 19 years use information technology driven by assignments from school.

Sixth, indicators of motivation, interest, and creativity in learning related to aspects of the PjBL model, local wisdom of NTT, and information technology obtained a percentage of respondents at 70.08% (agree). This suggests that students agree that the integration of local wisdom can make them more creative, interested, and motivated to study chemistry. Additionally, students have curiosity about the relationship between various NTT local wisdoms and chemistry, including local ikat weaving wisdom. According to Setyowati et al. (2022), learning motivation comes from within the student but requires other elements outside the subject itself. Based on these findings, it can be concluded that the application of the PjBL model based on local wisdom with the help of information system applications is an alternative to foster students' external motivation.

The results of this needs analysis support the next development stage in this research, which will involve identifying as much as possible the local wisdom of NTT and its relationship to high school chemistry material. This information will be compiled into a database for developing the PjBL model system application based on local NTT wisdom. The system will accommodate project themes and assessment aspects at each stage of the PjBL model in high school chemistry learning. It is hoped that this research will produce a product that answers the needs in the current era of industrial revolution 4.0, where technological developments are increasingly rapid and influence the type of educational instructional media developed. One such media is based on internet technology (Sugihartini & Yudiana, 2018).

The local wisdom that will be identified first is the process of making ikat woven cloth, and high school chemistry, linking these two aspects to produce a particular project theme. Next, knowledge and procedural aspects in the chemical material will be identified, which is a prerequisite for project implementation. Assessment aspects at each stage of the PjBL model will be identified and compiled, tested in the laboratory, validated, and arranged in the form of a certain logarithmic plot, to be developed in the form of an application system. In using this application system, teachers and each group of students will have their own accounts that can be run online, requiring only adequate internet access. Based on the needs analysis, no obstacles were found related to the lack of internet access by the research subjects, so the researchers are optimistic that this application system could be implemented well.

4 Conclusions

The research findings revealed a low percentage of teachers agreeing with positive statements regarding the development of assessment instruments and implementing the PjBL model, as well as identifying NTT local wisdom to be related to chemistry material. Specifically, 20% of teachers strongly disagreed, and 51.33% were neutral. The results of the interviews supported the questionnaire findings, emphasizing the need to identify the local wisdom of the NTT ikat weaving process for integration into chemistry learning. Analysis of student questionnaires indicated that they agreed with a percentage of >67.6% for all indicator statements supporting the development of a database of themes and project assessment aspects based on NTT local wisdom for the application of the PjBL model.

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