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Evaluation of the Implementation of the Independent Curriculum Phase E in Chemistry Learning at Senior High Schools in North Luwu Regency

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A B S T R A C T

This study aims to evaluate the implementation of the Independent Curriculum in phase E chemistry learning in State Senior High Schools throughout North Luwu Regency based on three main indicators: (1) learning preparation, (2) learning implementation, and (3) learning evaluation. This study uses a quantitative descriptive approach with an instrument in the form of a questionnaire filled out by 19 grade X chemistry teachers from 19 high schools, and is complemented by interviews to strengthen the data. The data were analyzed using descriptive statistics through scoring and categorization of the tendency level. The results of the study showed that the implementation of the Independent Curriculum based on learning preparation reached 90.98%; learning implementation 89.40%; and learning evaluation 89.47%. Thus, the implementation of the Independent Curriculum in phase E chemistry learning in State Senior High Schools throughout North Luwu Regency is included in the very good category for the three indicators evaluated.

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INTRODUCTION

Education continues to develop along with the increasingly complex demands of the times. To answer these challenges, the curriculum as the main guideline in the learning process has also changed. An effective curriculum should be simple, flexible, easy to understand and implement, and able to shape the competence and character of students in accordance with the values of Pancasila (Novianto, 2024). Responding to these needs, the government through the Ministry of Education, Culture, Research, and Technology developed the Merdeka Curriculum as an improvement on the previous curriculum, emphasizing the flexibility of educational units in organizing meaningful and student-centered learning.

The Independent Curriculum aims to provide ample room for teachers to innovate in learning, as well as provide contextual learning experiences that are relevant to students' needs. Teachers are the main actors who not only deliver material but also shape the personality and character of students as a whole (Wahyuddin et al., 2024; Rahayu et al., 2022). In this context, students' personal resilience is believed to grow through quality learning, and subsequently have an impact on family, community, and national resilience (Rusnaini et al., 2021).

However, the reflection conducted by the Chemistry Subject Teachers' Conference (MGMP) of North Luwu Regency in June 2024 showed that the implementation of the Independent Curriculum in chemistry subjects in high schools had not been running optimally. There were obstacles in terms of learning preparation, implementation in class, and learning evaluation. This was also reinforced by research by Utami et al. (2023), which found that the implementation of the Independent Curriculum still faced obstacles at all stages, from planning to evaluation. In addition, Taruklimbong and Murniarti (2024) highlighted the problem of delivering less interesting chemistry material and misconceptions of concepts that caused a decrease in students' interest in learning.

In the context of curriculum implementation, the role of teachers is very strategic. Teachers are not only implementers, but also curriculum developers who must understand the philosophy and technical implementation of learning (Jaghav & Patankar in Daga, 2021). Lidiawati et al. (2023) also emphasize the importance of the role of 21st century teachers in preparing learning that is responsive to future needs.

Based on the MGMP reflection and previous research results, it is important to evaluate the implementation of the Independent Curriculum in chemistry learning in State Senior High Schools throughout North Luwu Regency. This evaluation aims to see to what extent the implementation stages—both planning, implementation, and evaluation of learning—have been carried out in accordance with the principles of the Independent Curriculum.

LITERATURE REVIEW

Independent Curriculum in the Context of 21st Century Education

The Independent Curriculum was developed in response to global dynamics and learning needs in the 21st century. This curriculum emphasizes flexibility, simplification of materials, and strengthening of student

competencies and characters. The goal is to create meaningful, relevant learning and empower students as active subjects in the learning process (Novianto, 2024). Wahyuddin et al. (2024) explained that the Independent Curriculum allows educational units to adjust learning strategies to the characteristics of the subjects and school readiness.

The Role of Teachers in Curriculum Implementation

Teachers have a central role in the success of curriculum implementation. They are not only tasked with teaching, but also as facilitators, innovators, and agents of educational change. Jaghav & Patankar (in Daga, 2021) stated that the active involvement of teachers in the process of curriculum development and implementation greatly determines the effectiveness of learning. Lidiawati et al. (2023) added that 21st century professional teachers must be able to prepare future-oriented learning, which is adaptive to changes and the needs of students.

Challenges of Implementing the Independent Curriculum in Chemistry Learning

Several studies have revealed challenges in implementing the Independent Curriculum, especially in chemistry subjects. According to Utami et al. (2023), obstacles occur at all stages, from planning, implementation, to evaluation. Taruklimbong and Murniarti (2024) also noted that misconceptions of concepts and less interesting methods of delivering material also influence students' low interest in learning chemistry. Therefore, strengthening careful planning, innovative implementation strategies, and formative-oriented evaluation are very important in implementing the Independent Curriculum.

Urgency of Curriculum Implementation Evaluation

Curriculum implementation evaluation is an important part of the learning implementation cycle. This evaluation aims to identify the extent to which the designed program is in accordance with its implementation in the field. According to the Education Standards, Curriculum, and Assessment Agency of the Ministry of Education, Culture, Research and Technology (2022), the stages of implementing the Independent Curriculum include planning, implementation, and evaluation which must be carried out reflectively and continuously in order to improve the quality of learning as a whole.

METHODOLOGY

This study uses a quantitative descriptive approach that aims to evaluate the implementation of the Independent Curriculum in chemistry learning. The subjects of the study were grade X chemistry teachers in all public senior high schools in North Luwu Regency. Data collection techniques include questionnaires as the main instrument, as well as interviews and documentation as supporting data. The instruments used were questionnaires and interview guidelines that had been validated by experts. The collected data were analyzed using quantitative descriptive statistics, with scoring steps, grouping scores based on tendencies, and categorizing in the form of percentages according to the classification of the level of implementation.

RESEARCH RESULT

North Luwu Regency is one of the regions in South Sulawesi Province. There are 19 State Senior High Schools (SMAN) in North Luwu Regency located in 15 sub-districts. Based on the research conducted, all SMAN in North Luwu Regency have implemented the Independent Curriculum for two years. Specifically for SMAN 7 North Luwu and SMAN 9 North Luwu have implemented the Independent Curriculum for almost three years because both schools run the school mover program. All SMAN chemistry teachers in North Luwu Regency have participated in the Independent Curriculum training at least once, starting at the school level to national level training both online and offline.

From the results of research on chemistry teachers of Class X SMAN in North Luwu Regency, there are several teachers who have a fairly long work period including chemistry teachers of SMAN 1, 2, 3, 4, 5, 6, 8, 10, and 18. This is in line with the implementation of learning in schools taking place better. The implementation of the Independent Curriculum in schools for teachers with a longer work period and frequent training on the Independent Curriculum will improve teacher competence in preparing learning, managing classes, and the ability of teachers to innovate in learning so that students can achieve learning goals thereby improving student learning outcomes. This is in accordance with Hasan's research (2015) which states that in addition to the professional competence of teachers in the academic field which can affect teacher performance, teacher tenure also plays a role in improving student learning achievement. This is because knowledge and experience can contribute to mastery of classroom management skills, because with adequate education and supported by a long work period, teachers can know and understand more about various aspects of implementing teacher duties that are directly related to improving student learning achievement. Based on research by Sitopu et al. (2023), it was concluded that there were four improvements experienced by teachers after participating in training, namely increased mastery of technology, integration of technology in learning, changes in teaching behavior, and collaboration between teachers and provinces through existing learning communities.

Based on the results of the questionnaire filled out by respondents of SMAN teachers in North Luwu Regency for three observation indicators, namely preparation, learning implementation process, and evaluation, the following are the percentage results for each indicator.

Learning Preparation

The percentage results of the questionnaire for the learning preparation indicators are shown in Table 1.

Table 1. Data Analysis Based on Chemistry Learning Preparation Indicators for Senior High Schools in North Luwu Regency

No	School name	Percentage Indicator Acquisition	Qualification
1	Sman 1	97.14	Very good
2	SMAN 2	80.00	Very good
3	SMAN 3	97.14	Very good
4	SMAN 4	97.14	Very good
5	SMAN 5	94.29	Very good
6	SMAN 6	80.00	Very good
7	SMAN 7	85.71	Very good
8	SMAN 8	97.14	Very good
9	SMAN 9	97.14	Very good
10	SMAN 10	82.86	Very good
11	SMAN 11	97.14	Very good
12	SMAN 12	94.29	Very good
13	SMAN 13	85.71	Very good
14	SMAN 14	88.57	Very good
15	SMAN 15	91.43	Very good
16	SMAN 16	97.14	Very good
17	SMAN 17	88.57	Very good
18	SMAN 18	94.29	Very good
19	SMAN 19	82.86	Very good
Average		90.98	Very good

Table 1 shows the average learning preparation indicator of all State Senior High Schools in North Luwu Regency reached 90.98% with very good qualifications. There are six schools with the highest percentage for the learning preparation indicator with a value of 97.14%, namely SMAN 1, SMAN 3, SMAN 4, SMAN 8, SMAN 9, and SMAN 16. While the lowest percentage was obtained by SMAN 6 with a value of 80.00%.

Implementation of Learning

The percentage results of the questionnaire for learning implementation indicators are shown in Table 2.

Table 2. Data Analysis Based on Chemistry Learning Implementation Indicators at Senior High Schools in North Luwu Regency

No	School name	Percentage Indicator Acquisition	Qualification
1	Sman 1	97.14	Very good
2	SMAN 2	84.29	Very good
3	SMAN 3	95.71	Very good
4	SMAN 4	94.29	Very good
5	SMAN 5	95.71	Very good
6	SMAN 6	78.57	Very good
7	SMAN 7	81.43	Very good
8	SMAN 8	97.14	Very good

9	SMAN 9	75.71	Very good
10	SMAN 10	87.14	Very good
11	SMAN 11	95.71	Very good
12	SMAN 12	87.14	Very good
13	SMAN 13	91.43	Very good
14	SMAN 14	85.71	Very good
15	SMAN 15	97.14	Very good
16	SMAN 16	92.86	Very good
17	SMAN 17	91.43	Very good
18	SMAN 18	95.71	Very good
19	SMAN 19	75.71	Very good
Average		89.40	Very good

Table 2. shows the achievement of learning implementation indicators, each SMAN in North Luwu Regency. The average percentage reached 89.40% with very good qualifications. There are two schools with the highest percentage for learning implementation, namely SMAN 1, and SMAN 15 with a value of 97.14%. While the lowest percentage was obtained by SMAN 9 and SMAN 19 with a value of 75.71%.

Learning Evaluation

The percentage results of the questionnaire for learning evaluation indicators are shown in Table 3.

Table 3. Data Analysis Based on Chemistry Learning Evaluation Indicators at Senior High Schools in North Luwu Regency

No	School name	Percentage Indicator Acquisition	Qualification
1	Sman 1	97.14	Very good
2	SMAN 2	80.00	Very good
3	SMAN 3	97.14	Very good
4	SMAN 4	97.14	Very good
5	SMAN 5	97.14	Very good
6	SMAN 6	80.00	Very good
7	SMAN 7	77.14	Very good
8	SMAN 8	97.14	Very good
9	SMAN 9	91.43	Very good
10	SMAN 10	80.00	Very good
11	SMAN 11	88.57	Very good
12	SMAN 12	94.29	Very good
13	SMAN 13	91.43	Very good
14	SMAN 14	74.29	Very good
15	SMAN 15	94.29	Very good
16	SMAN 16	97.14	Very good
17	SMAN 17	94.29	Very good
18	SMAN 18	94.29	Very good
19	SMAN 19	77.14	Very good
Average		89.47	Very good

Table 3 shows that for the learning evaluation indicator, the average percentage reached 89.47% with very good qualifications. The highest percentage for learning evaluation was obtained by SMAN 1 and SMAN 8 with a value of 97.14%. While the lowest percentage was obtained by SMAN 7 and SMAN 19 with a value of 77.14%.

DISCUSSION

This study is an evaluation study of three indicators of the implementation of the Independent Curriculum phase E in SMAN, namely preparation, learning implementation process, and evaluation. The evaluation carried out on the three indicators aims to determine the level of success of the program and its suitability to the objectives. Wijayanti (2019) stated that the evaluation of the learning process is the implementation of real activities in the field. Based on the results of the study, the implementation of the Independent Curriculum phase E in the chemistry subject of SMAN in North Luwu Regency is quite good. Although the implementation is not entirely the same for all schools but is adjusted to the readiness of each educational unit, this is in line with the opinion of Yuliawan et al. (2023) who stated that the implementation of the Independent Curriculum is not forced to be applied simultaneously by all schools considering that school readiness certainly varies. However, it is hoped that the Independent Curriculum can be gradually implemented evenly in each educational unit. This is reinforced by the results of Febrianti's research (2022) which states that an educator must be able to pay attention to what provisions affect the learning process to feel monotonous. Teachers' efforts to achieve a goal in learning require energy, hard work, creativity and teachers playing an active role and innovation.

Based on the results of the study on the preparation indicator, all chemistry teachers of senior high schools in North Luwu Regency are in very good qualifications in preparing learning activities with a percentage in the range of 76-100%. This is supported by the existence of the Chemistry subject teacher deliberation (MGMP) activity which is carried out at the beginning of the school year to discuss together the analysis of learning achievements, so that it can be reduced to learning objectives and learning objective flows. Through these MGMP activities, chemistry teachers can discuss and share experiences to design more enjoyable and student-centered learning. The achievement of indicators at the learning preparation stage with the lowest percentage, namely 82%, was obtained in the indicator of teacher ability in determining targets and the number of students. Teachers are still preparing learning that applies generally to all classes. This is in accordance with the results of interviews with teachers of SMAN 7 North Luwu that teachers are still making teaching modules that apply to all classes taught. While the highest percentage, namely 99% in the indicator of compiling teaching modules, shows that chemistry teachers of senior high schools in North Luwu Regency have compiled teaching modules and prepared teaching materials before learning.

In preparation for learning, chemistry teachers at SMAN in North Luwu Regency implement the Independent Curriculum which uses a student-centered learning model. Most teachers use project-based, problem-based, and discovery learning models. Students are given the freedom to explore their abilities, be

more independent, develop a critical attitude, and provide space for students to learn according to their needs. According to the results of Prasetyo's research (2021), student-centered learning is an effort to improve the quality of education and learning in schools. Student-centered learning is an effort that can be made to develop and train individuals to be more individual original and improve learning according to student interests.

The research data shows that overall, grade X chemistry teachers of SMAN in North Luwu Regency show very good qualifications in the learning process. There are two schools with an achievement of 75.71%, namely SMAN 9 and SMAN 19 with high qualifications but need revision on low indicators. Based on the results of interviews with teachers of SMAN 5, SMAN 3, and SMAN 1 North Luwu, it shows that not all students are active during the learning process, but most students have participated in group discussions and presentations. This is because students still lack confidence in expressing their opinions. Therefore, chemistry teachers from the three schools will continue to strive to foster self-confidence and enthusiasm for learning in their students. Meanwhile, according to teachers of SMAN 2, SMAN 3, and SMAN 8 Lutra, almost all students are confident in expressing their opinions during group discussions and presentations. According to Ruhimat (2012), the learning process is one of the important stages in learning. Therefore, the learning process needs to be taken through systematic and systemic procedures. The learning procedure is a sequential process in forming student abilities according to predetermined objectives. One aspect that influences the success of learning is the teacher's ability to manage learning, in the process the management must be directed to become a meaningful and conducive process in the formation of student abilities. Therefore, learning activities in addition to being developed systematically, effectively and efficiently also need a variety of activities as an alternative to fostering student motivation and activity in learning.

Research data shows that at the implementation stage of learning, the lowest percentage, namely 77%, is the indicator of teachers' ability to carry out learning according to the syntax of the previously planned learning model. This is because teachers have not been able to fully control student activities in the classroom. The highest percentage, namely 99%, is in two indicators, namely in the preliminary activities, teachers always start learning with greetings, and in the core activities, teachers have been able to carry out learning that fosters the Pancasila Student Profile, including faith, responsibility, criticality, mutual cooperation, creativity, and independence. The implementation of learning includes introduction, core activities, and closing. In this study, preliminary activities include components of greeting, providing apperception and motivation, conveying learning objectives, dividing student groups, conveying an outline of the material to be discussed, and preparing and creating pleasant learning conditions. Research data shows that almost all grade X SMAN chemistry teachers in North Luwu Regency implement these five components. This can provide an illustration that chemistry teachers in North Luwu Regency are already aware of the importance of preparing students well before starting learning activities. This is in line with the theory put forward by Ruhimat (2021)

that the function of preliminary activities is to create an effective start to learning that allows students to follow the learning process well. Furthermore, the results of the interview also showed that the provision of apperception by class X SMAN chemistry teachers in North Luwu Regency focused more on activities to briefly review the learning materials that had been studied with those to be studied so that the relationship could be understood by students. Based on the results of interviews with chemistry teachers, students seemed more comfortable learning and felt helped by group members who had a higher level of understanding in understanding the material and solving the problems given. Chemistry is one of the main subjects at the senior high school level which aims to equip students with the ability to think logically, analytically, systematically, critically, and creatively. Through group discussions, students will interact with each other, share information and solve the problems given. The results of Tonapa and Tahya's (2022) study, namely the use of group discussion methods in learning, allow students to interact and communicate with each other and can make them participate actively during learning because students' interest in learning chemistry increases. According to Nuraini et al. (2018), there is a positive relationship between student learning activities and learning outcomes in chemistry subjects. The higher the participation of students in the learning process, the better the chemistry learning outcomes of students.

Based on the research results, grade X chemistry teachers of SMAN in North Luwu Regency have conducted assessments. The percentage of evaluation implementation of SMAN 14 North Luwu is 74.29% with high qualifications but needs improvement. In general, the lowest percentage of implementation of Phase E chemistry learning evaluation at SMAN North Luwu Regency is 78% where teachers have not maximized their efforts in measuring the effectiveness of learning, student responses to learning, and long-term learning benefits. While the highest percentage, namely 99%, on the assessment result indicator can encourage students to learn better.

In addition to SMAN 14, all SMANs in North Luwu Regency have carried out evaluations well according to the results of the questionnaire with a percentage above 76% with very good qualifications. According to the results of an interview with a chemistry teacher at SMAN 9 North Luwu, through formative assessments, teachers can see the strengths and weaknesses of the learning process being carried out. In addition, according to a chemistry teacher at SMAN 8 North Luwu, the implementation of diagnostic assessments is very much needed to prepare teaching modules and student mapping in implementing learning. With this mapping, teachers can carry out learning according to student needs. In the evaluation process, teachers evaluate by looking at student learning outcomes carried out at the beginning of the learning process, during learning, and after the learning process takes place. The role of teachers in evaluating learning is very important to see the learning process. The results of Setiawan's research (2021) explain that learning evaluation is a process of determining student learning scores using certain guidelines in order to achieve predetermined learning objectives.

CONCLUSIONS AND RECOMMENDATIONS

Based on this research, it was concluded that:

1. The implementation of the Independent Curriculum in phase E chemistry learning at State Senior High Schools in North Luwu Regency based on learning planning reached 90.98% with very good qualifications.
2. The implementation of the Independent Curriculum in phase E chemistry learning at State Senior High Schools in North Luwu Regency based on learning implementation reached 89.40% with very good qualifications.
3. The implementation of the Independent Curriculum in phase E chemistry learning at State Senior High Schools in North Luwu Regency based on learning evaluation reached 89.47% with very good qualifications.

Based on the research results, it is recommended that chemistry teachers at Senior High Schools in North Luwu Regency continue to optimize responsive learning planning to students' needs by adjusting teaching modules specifically for each class, improving the quality of learning implementation through the application of active and collaborative models, and strengthening learning evaluation with a comprehensive diagnostic and formative approach. In addition, ongoing training for teachers needs to be encouraged to deepen understanding of the implementation of the Independent Curriculum, especially related to differentiated learning and authentic assessment. The evaluation results are also expected to be used by schools and policy makers as a basis for continuous improvement in improving the quality of learning. To enrich understanding, further research with a qualitative or mixed approach is also recommended to be able to explore more deeply the supporting and inhibiting factors in the implementation of this curriculum.

ADVANCED RESEARCH

This study still has limitations in the descriptive quantitative approach that does not fully describe the dynamics of the implementation of the Independent Curriculum in depth, especially in the context of challenges, adaptation strategies, and perceptions of teachers and students during the learning process. Therefore, further research is recommended using a qualitative approach or mixed methods to explore more deeply the experiences of teachers, the obstacles faced, and the effectiveness of the learning model applied in the Independent Curriculum, especially in chemistry subjects. In addition, comparative studies between levels of education or between regions can also be conducted to see the diversity of curriculum implementation practices and their impact on student learning outcomes.

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