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Teacher Learning Process in Implementing the Independent Learning Curriculum in the High School Environment

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ABSTRAK

Guru dalam Kurikulum Merdeka memiliki peran yang sangat vital, mulai perencanaan pembelajaran, menyusun materi, memilih model, metode implementasi, dan penilaian. Namun fakta dar 70 siswa ada 34 orang mempunyai nilai mean sebesar 28,26. Fakta lain, ada 68,65% tidak sesuai tugas dan 48% siswa tidak tuntas. Urgen diteliti karena ada perbedaan teori, harapan, dan realita di lapangan. Tujuan penelitian ini adalah untuk menganalisis manajemen penyusunan rencana pelaksanaan pembelajaran dan penerapan kurikulum mandiri di SMA. Metode penelitian yang digunakan adalah mixed research. Populasi adalah siswa sekolah menengah atas dengan sampel 156 orang yang terdiri dari 130 siswa dan 26 guru. Teknik pengumpulan data dengan survei dan wawancara. Instrumen disusun berdasarkan indikator dan dibagikan melalui link Google from. Teknik analisis data menggunakan SPSS Statistics 26.0 sedangkan data wawancara di analisis dengan pengumpulan data, reduksi, dan penarikan kesimpulan. Hasil dan temuan menunjukkan bahwa 22% guru menyiapkan rencana pelaksanaan pembelajaran, 23.67% guru mampu menyampaikan materi, 32,49% mampu menilai secara objektif, 26.76% siswa mengalami perubahan perilaku dari pembelajaran dan hanya 34,26% guru yang mampu melakukan penilaian secara objektif. melaksanakan evaluasi pembelajaran kurikulum pembelajaran mandiri. Hasil wawancara bersinggungan dengan hasil survei. Kesimpulan, penerapan kurikulum merdeka belajar perlu di evaluasi dan perlu ada pelatihan.

ABSTRACT

Teachers in the Independent Curriculum have a vital role, starting from planning learning, compiling materials, choosing models, implementation methods, and assessment. However, the fact is that out of 70 students, 34 people had a mean score of 28.26. Another point is that 68.65% did not match the assignment and 48% of students did not complete it. It is urgent to research because there are differences in theory, expectations, and reality in the field. The aim of this study is to analyze management prepares learning implementation plans and implementing the independent curriculum at high school. The research method used is mixed research. The population is high school students with a sample of 156 people consisting of 130 students and 26 teachers—data collection techniques using surveys and interviews. Instruments are arranged based on indicators and shared via Google from the link. The data analysis technique uses SPSS Statistics 26.0 while the interview data is analyzed by data collection, reduction, and concluding. The results and findings show that 22% of teachers prepared learning implementation plans, 23.67% of teachers were able to deliver the material, 32.49% were able to assess objectively, 26.76% of students experienced changes in behavior from learning and only 34.26% of teachers were able to assess objectively carry out learning evaluations of the independent learning curriculum. The interview results intersect with the survey results. In conclusion, the implementation of the independent learning curriculum needs to be evaluated and there needs to be training.

1. INTRODUCTION

Weak learning management in learning implementation has an impact on the curriculum and a lack of teacher preparation in designing learning methods, models and strategies will give rise to new problems

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during implementation Andrade-Arenas et al., 2022; Costan et al., 2021). Difficulties and obstacles for someone in carrying out, carrying out, and completing the tasks that have been given (Alalwan et al., 2020; Kaasinen et al., 2020; Wildenbos et al., 2019). High school is a time when teachers must try to prevent students from difficulties and obstacles, both psychological and physical (Silva et al., 2022; Wong et al., 2021). To overcome difficulties, teachers should prepare the material carefully and in a planned manner complete with an assessment process. Whereas in the world of education, teachers play an important role in designing material objectives derived from the curriculum (Kumar & Rewari, 2022; Shim & Lee, 2020). In current conditions, the independent learning curriculum has been implemented in schools. The independent curriculum approach expects teachers to have good skills in the field being taught, and this aims to ensure that the learning process runs effectively and efficiently. Before implementing the material to be taught, the teacher first prepares a learning implementation plan, materials, and learning model (Andrade-Arenas et al., 2022; Purwanto et al., 2020)

Success in managing the implementation of the independent learning curriculum by teachers can be measured from several indicators that have been determined (Ayanwale et al., 2022; Yusop et al., 2022). The first indicator is the teacher's learning plan. The teacher's commitment to designing so that the learning process runs effectively with another expectation is that the teacher has determined the materials, methods, duration, and assessment as well as the form of assessment and design. The second indicator is teaching ability. Indicators of the success of managing the curriculum studied in teaching can also be observed through the way the teacher conveys the material to students. All teachers who are qualified in their field can use different learning models, methods and strategies. The independent curriculum recommends three educational models that can be applied: the blended learning model, the flipped classroom, and the project-based learning model. The third indicator of success in implementing management is student evaluation (Cabello & Topping, 2020; Calavia et al., 2023; van Dijk et al., 2020). Student success is also the teacher's success, because student success in achieving good educational results cannot be separated from the role of the teacher. Participants with good learning outcomes can be assessed as understanding the topics presented by the teacher.

There are many abilities that teachers must have to create effective learning activities and help students achieve learning goals. The fourth indicator is changes in student behavior. Good student behavior and personality show the teacher's success in instilling good values. This can be seen in students who were initially inactive, becoming active, more disciplined, responsible, and respecting other people's opinions. The fifth indicator is the evaluation of the subjects taught. This indicator can be measured from the extent of the teacher's progress in the previous learning process. The five indicators of teacher success above outline the duties and obligations of teachers in implementing an independent learning approach which aims to ensure that student participation is even, learning is effective and that there is no student negligence in the subjects being taught (Luckin et al., 2022; Owan et al., 2023; Pérez-Ordás et al., 2021)

Previous study state that the material is planned systematically by the teacher in directing and guiding students towards maturity (Moreira et al., 2023). In the independent learning curriculum, teachers' duties and responsibilities are the same, that is, when they move toward higher education they can carry out their duties and responsibilities independently and effectively. Such as the explanation in the bag one of the indicators that a teacher is said to be successful in implementing learning is if the mean student learning outcomes are above the minimum standard of completeness that has been determined (Greif et al., 2020; Liu et al., 2022; van Dijk et al., 2020). But the facts show that student learning outcomes in all subjects are included in the low category, with results data only reaching a mean score of 62.45 and 48% of students have not achieved results according to the minimum standard that has been determined, namely 75 as state by previous studied (Stringer et al., 2023). The low learning achievement score cannot be separated from the learning planning that is carried out by teachers, and prepare materials and models that suit the needs of the students being taught. Because the design and implementation of subjects must adopt models contained in very diverse independent learning approaches. Educators who are unable to implement the new curriculum will harm students and slow down teaching progress and students' attitudes toward the learning process. From the data obtained, there were 62% of students did not agree with the professional competence of teachers when implementing the self-learning curriculum model (Gordon et al., 2024).

The urgency of research is because there are differences between theory, expectations, and reality in the field. This theory states that a teacher is effective in designing learning implementation plans and is active in compiling material, with the hope that the material provided will make it easier for students to understand the subjects given by the teacher when learning is carried out. However, in fact, in the field, students still experience many difficulties in the learning process. The facts above show that there are differences between theory, facts, and expectations, so there are gaps and it is necessary to know where the difficulties are and the solutions. So, this research aims to analyze the process of implementing the independent learning curriculum at the high school level, with the specific aim of finding out how

management prepares learning implementation plans and implementing the independent curriculum at high school. The novelty of this research lies in its focus on exploring the practical application of the Independent Learning Curriculum (Kurikulum Merdeka Belajar) within a high school environment, specifically from the perspective of the teacher learning process.

2. METHOD

This research uses mixed methods. This mixed method combines quantitative descriptive research with surveys and qualitative research by conducting interview sessions (Camilli Trujillo et al., 2022; Hong et al., 2019). Mixed methods research is a solution to produce descriptive data that is more precise and can be measured and interpreted in the form of numbers and sentences (Mikalef et al., 2019; Strijker et al., 2020). The object of this research is a high school with a sample of 156 people. Of the 156 people, 130 were high school students and 26 were teachers who taught the independent learning curriculum in high schools. This research is located in Bandung, Indonesia. The sampling technique does not pay attention to competency status and randomly selects students from each class who have used the independent learning curriculum in their learning process.

The data collection technique in this research is in two ways, namely by obtaining primary data, namely by survey type and secondary data by interview type. According to previous study data obtained using surveys and interviews will be much more accurate and accountable (Bavaresco et al., 2020; Oprescu et al., 2022). The survey data in this research was obtained by distributing instruments to all 156 respondents, namely teachers and students who were directly involved in the learning process of the independent learning curriculum. The instrument was distributed via a Google form link. The instruments outlined in the Google link have been developed and compiled based on success indicators and indicators that are the teacher's responsibility in implementing the independent learning curriculum in high school. The instrument was assessed based on a Likert scale with points 1 to 5. Data obtained from the survey results became the basis for preparing questions in interviews to ensure the truth of the data findings. Interview data was obtained by conducting interview sessions with 26 teachers. Survey data and interview data are harmonized and the intersecting data becomes the final result and becomes the basis for concluding. The indicators in this research that became the basis for preparing the instrument as show in Table 1.

Table 1. Research Indicators

Numbers	Indicator
1	Measuring the Preparation of Learning Implementation Plans
2	Measuring Teaching Ability
3	Measuring Teachers' Ability to Assess
4	Measuring Changes in the Behaviour of Students Being Taught
5	Carrying out the Evaluation Process

Table 1 shows all the indicators in this research that were used as measuring tools. This indicator is the basis for finding difficulties, and obstacles and answering the problem of why student learning outcomes are low in implementing the independent learning curriculum in preparing learning plans, preparing materials, and arriving at the stage of implementing the independent learning curriculum. The indicators in Table 1 are the entry point in determining the location of difficulties and obstacles and are the basis for finding the right solution to overcome problems.

The data analysis technique in this research was with the help of SPSS Statistics 26.0. SPSS Version 26.0 is used to measure means, and percentages and depict them in bar charts. The results of the analysis will be interpreted (Rivera-Sotelo et al., 2021; Queiroz et al., 2020). The survey data was analyzed in stages for each research indicator and a bar chart to illustrate the data findings. The results of the survey data analysis were interpreted and became the basis for conducting interview sessions. Interview data was analyzed in stages, data collection, and data presentation within a predetermined data collection period. At the initial stage of the research, the researcher carried out a general examination of the social situation/object being studied, and everything that was seen and heard in this research was recorded and recorded. In this way, researchers get a lot of varied data. Data is collected at different times of the day. After the data was collected, the research carried out data reduction. This data is summarized, selected, and sorted into main points related to indicators of implementing the independent learning curriculum. All unrelated data was discarded and related words were grouped and coded. The data that has been reduced is drawn to conclusions. The conclusions from the interview data were then aligned with the survey data and became the final stage in drawing research conclusions.

3. RESULT AND DISCUSSION

Result

The following are the results of research and findings from the field regarding the preparations made by teachers before the learning process is carried out by following the independent learning curriculum in high school. The results of the survey assessment show that several indicators that are teachers' obligations have been implemented, however, this research shows that there are still indicators that cause difficulties and become factors that hinder teachers in implementing the independent learning curriculum. Following are the results outlined in a bar chart, all the responses from the interviewees are purely based on the results of the respondents' assessments. The result of assessment of teacher preparation in learning implementation plans is show in Figure 1.

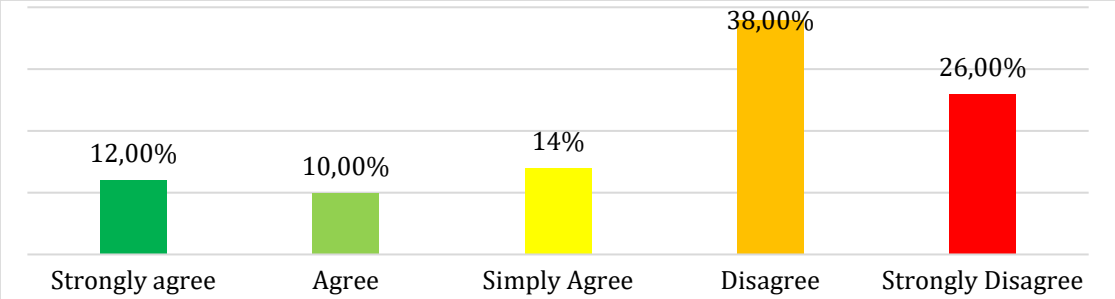

Figure 1. Assessment of Teacher Preparation in Learning Implementation Plans

Figure 1 show that respondents assess that some teachers have carried out their responsibilities in preparing lesson plans. However, the data shows that there are still 38% who do not agree that teachers have prepared learning implementation plans based on the independent learning curriculum. The data also shows that 26% of respondents strongly disagree that teachers have prepared learning implementation plans in high school based on the independent learning curriculum. Overall, 64% strongly disagreed and disagreed that teachers had carried out their responsibilities as expected. Results of assessment of teachers' teaching ability is show in Figure 2.

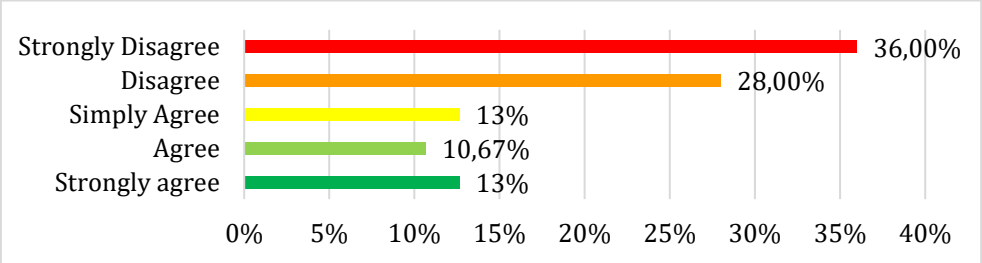

Figure 2. Results of Assessment of Teachers' Teaching Ability

From the data shown in Figure 2, it can be seen that 36% of respondents strongly disagree with the current ability of teachers to implement the independent learning curriculum, 28% of respondents disagree, 13% agree, 10.67% and 13% agree, and strongly agree. By looking at the data in Figure 2, it is necessary to hone teacher abilities and carry out training in implementing the independent learning curriculum. As many as 64% expect an increase in the quality of teaching in implementing the independent learning curriculum. Results of respondents' assessment of teachers' ways of giving assessments is show in Figure 3.

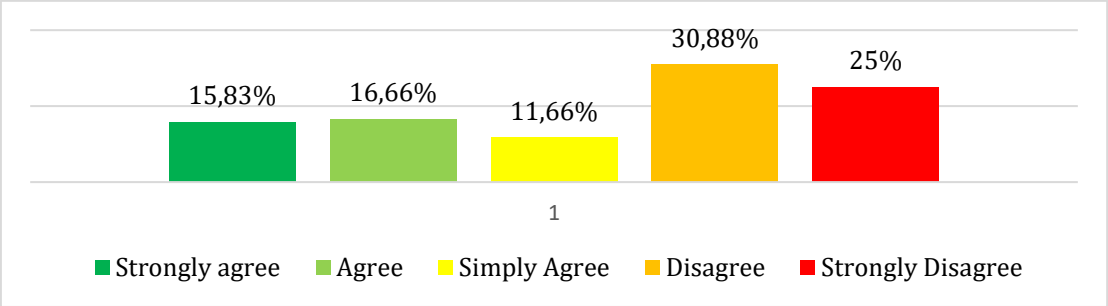

Figure 3. Results of Respondents' Assessment of Teachers' Ways of Giving Assessments

By looking at the survey results in Figure 3, there are 25% of respondents strongly disagree with the teacher's ability to assess the independent learning curriculum based on high school and 26.88% disagree. If in total there are 55.88% of respondents who disagree, it is necessary to conduct training on how to assess the learning process in implementing the independent learning curriculum.

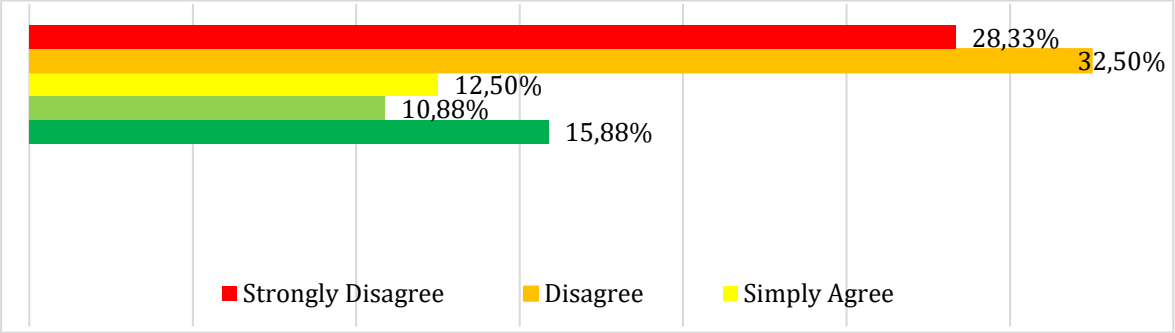

Figure 4. Respondents' Assessment of Indicators of Changes in the Behavior of Students Being Taught

Figure 4 shows the assessment of changes in the behavior of students taught by the teacher is still not far from expectations. There are 28.33% strongly disagree and 34.70% disagree. These findings indicate that there are still 60.83% that need to develop their abilities and skills in changing the behaviour of students from those who do not want to learn to want to learn. Of all the respondents, only a total of 26.76% experienced a change in behavior in the learning process using the independent learning curriculum in senior high schools.

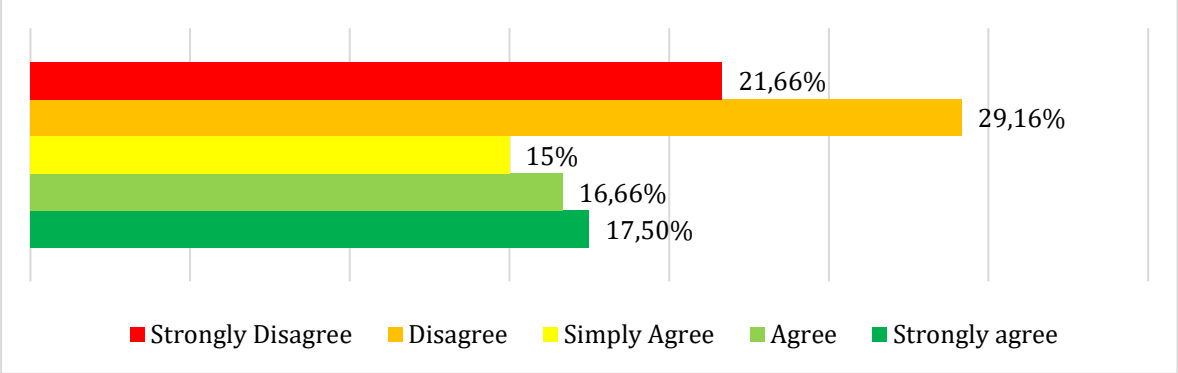

Figure 5. Results of Respondents' Assessment of Learning Process Evaluation Indicators

Figure 5 shows that respondents considered that 21.66% strongly disagreed and 29.16 did not agree. If the total number of respondents who disagree with the learning evaluation process carried out by the teacher is 70.82%. This finding confirms that teachers in evaluating the learning process must be provided with debriefing before the process of implementing the independent learning curriculum is carried out. Schools must provide training freely and facilitate teachers to participate in training to evaluate the implementation of the independent learning curriculum in high schools.

Table 2. Results of Coding Interviews with Multicultural Environment Resource Persons in Learning

Indicator	Frequently Appearing Words	Interpretation
Develop a learning implementation plan	12 people prepared lesson plans and 18 people did not prepare lesson plans	More teachers are hampered and have difficulties in preparing lesson plans which has an impact on the implementation of the independent learning curriculum.
Teaching Ability	Papa's obstacles in compiling material, the difficulty in choosing a model	Teachers have difficulty choosing the right model and method for implementing spaced material

Indicator	Frequently Appearing Words	Interpretation
Judgment Ability	Lack of training in scoring methods	Teachers need training in preparing assessments and how to assess the process of implementing the independent learning curriculum
Changes in the Behavior of Learners being taught	Weak interest in student learning	The process of implementing learning has not been able to attract students' interest in learning to change their behavior to become interested in learning
Conduct Evaluation Process	8 people did the evaluation and 22 people did not do the evaluation.	There are still more teachers who admit difficulties in evaluating the learning process based on the independent learning curriculum.

From Table 2, the results of coding interviews with resource persons show that there are still more teachers who have not discussed plans for implementing learning and preparing teaching materials. Of the total teachers interviewed, 18 teachers thought that they had not prepared teaching materials and were still using material from textbooks. This has an impact on teachers' weak ability to teach in the classroom. The respondents thought that when teaching with an independent learning curriculum they experienced difficulties and experienced many obstacles and difficulties. The lack of training carried out by schools regarding the preparation of materials and training on how to use models and methods is one of the reasons respondents experienced difficulties. The students being taught also have little interest in learning using the independent learning curriculum. Respondents also said that teachers rarely evaluate the learning process, because teachers' performance is not only teaching but also taking care of a lot of administration. This has an impact on the teacher's minimal desire to carry out evaluations.

Discussion

In the Independent Curriculum Learning Implementation Plan in the educational environment for multicultural students in high school, it was found that learning planning was still lacking in the independent learning curriculum. It was found that 38% did not agree that teachers had prepared learning implementation plans when implementing material from the independent learning curriculum. This data does not stand alone, 26% of respondents strongly disagree that teachers have prepared learning implementation plans at the high school level by completing the material. These two data amount to 64% which states that improvements in planning and preparation before implementing the independent learning curriculum were carried out by high school-level teachers. Another finding from the interview results was that more teacher respondents stated that they did not prepare a learning implementation plan but instead used the learning implementation plan used in the 2013 Curriculum which was the basis for implementing the independent learning curriculum. Even though previously it was considered that the learning implementation plan referring to Curriculum 13 was no longer suitable for use. Previous research states that incorrect planning has an impact on the learning process (Becker et al., 2020; Cankurtaran & Beverland, 2020; Sgarbossa et al., 2020). These findings have an impact on student achievement and expectations in understanding and obtaining better learning outcomes. These findings emphasize that teachers who teach in high school must be given training and knowledge about appropriate learning methods and models to be designed before implementing an independent learning curriculum. This finding has an impact on teachers' mastery of the material, from Figure 2 it can be seen that 64% expect an increase in the quality of teaching in implementing the independent learning curriculum. The root of the problem is a lack of training in planning and preparing materials, models and methods before implementing the independent learning curriculum. These findings are in line with research Cattaneo et al., (2020), Harder et al., (2020), and Reed, (2020) that teachers must be provided with training and debriefing before the learning process is carried out.

Barriers and difficulties for teachers in implementing the independent learning curriculum. From the survey, it can be seen that teachers' obstacles in implementing the independent learning curriculum stem from incomplete planning. Teachers use material in textbooks although teachers can arrange modules according to the abilities of the students being taught. Teachers also do not prepare assessment sheets so that teachers have difficulty assessing the learning process and the absence of a test assessment rubric provided has an impact on the unsystematic assessment of learning outcomes. Data shows that 64% expect teachers to prepare learning implementation plans at the beginning, 64% expect to improve the quality of teaching in implementing the independent learning curriculum, and 63.08% expect teacher training on how to assess the learning process in implementation. The independent learning curriculum still has minimal changes. 60.83% of students' learning behavior needs to develop abilities and skills in changing student

behavior from not wanting to learn to being willing to learn. Teachers' difficulties in compiling material are detrimental to students' understanding (Kamil et al., 2020; Guntur & Setyaningrum, 2021). Based on Table 2, the results of teacher interviews show that teachers hope for training in preparing learning implementation plans that are by the independent learning curriculum, teachers also hope for special training on how to assess and evaluate material independently. The learning curriculum and interview results also show that it is difficult to choose the right learning model for the students being taught. Difficulty in choosing a learning model hurts students' knowledge (Zhang et al., 2020).

Evaluation of the Implementation of the Independent Curriculum. The research results show that evaluations carried out by the community at high school are still rare. It can be seen from Figure 5 that there are 70.82% strongly disagree and disagree with the evaluation of the learning process based on the independent learning curriculum in high school. This data shows the weak ability and lack of teacher preparation in making corrections and evaluating the learning process. These findings hurt increasing students' understanding, knowledge, and grades. During the interview, the teacher stated in his confession that he often encountered obstacles and difficulties when evaluating the furniture teaching process. Sometimes the model is right, but the way it is assessed is wrong. An inappropriate assessment process influences the child's development and psychology (Wullschleger et al., 2020). In finding the right method, sometimes the stamp does not match the model used. Teachers assess that the examples of evaluation models provided by the government are different from the school conditions taught in the field. The model used in learning in junior high school is very different from the model used in high school. In high school, students are expected to be able to develop their skills, even though in the field, students still need to be given convergence assistance. The material that must be prepared by the teacher must also be by the initial abilities of the students being taught, this is what often causes the initial learning process to not be in line with the expectations and targets of the independent learning curriculum. In the evaluation, it is known that teachers need to prepare for the initial planning stages and need assistance in drawing up plans, both planning materials, models, and assessments up to the planning stage of the evaluation form. Because in this study more respondents disagreed with the form of evaluation compared to respondents who agreed. A good and correct assessment and evaluation process will gradually increase student learning discipline (Eltanahy et al., 2020).

The implications of the research have a broad impact on the educational context in Indonesia. The research results highlight several key areas that require serious attention to improve the quality of learning in schools. First, there is a need to improve the quality of learning through training and mentoring for teachers. The finding that the majority of teachers have not been able to deliver material effectively and carry out assessments objectively shows the need for concrete efforts to improve teachers' skills and competencies in designing and implementing quality learning. In addition, the finding that most students cannot complete assignments and do not meet expectations highlights the need for evaluation and development of curricula that are more relevant and appropriate to student needs. Thus, developing a curriculum that is more adaptive and responsive to student needs is important to improve learning outcomes. Furthermore, the importance of strategies that can increase student involvement in learning also has significant implications. Teachers need to look for innovative and interesting teaching methods so that students can be more active and involved in the teaching and learning process. Apart from that, the need to develop teachers' skills in using educational technology is also an important implication. By utilizing technology effectively, teachers can create more interesting and interactive learning experiences for students. Lastly, good collaboration between teachers and students is also key to improving the quality of learning. Teachers need to understand students' needs and interests and involve them actively in the learning process. By paying attention to these implications, it is hoped that this research can make a significant contribution to efforts to improve the quality of education in Indonesia, strengthen the implementation of the Independent Curriculum, and create a learning environment that is more inclusive, innovative, and oriented towards optimal results for holistic student development.

There are several limitations that need to be noted. First, there are limitations in generalizing the research results because the research was conducted in only one school in Bandung, Indonesia. This can affect the representativeness of the findings to student and teacher populations throughout Indonesia. Second, there are limitations in data collection which only uses survey and interview methods. The use of this method can limit an in-depth understanding of the factors that influence the implementation of the Merdeka Curriculum in various school contexts. Apart from that, limitations in the relatively small sample size, namely 156 respondents, can also affect the validity and reliability of the research results. Furthermore, limitations in research time may not cover all relevant aspects of the implementation of the Merdeka Curriculum. Research conducted over a certain period of time may not be able to capture changes or dynamics that occur over the long term. Lastly, a limitation in the data analysis may not include all variables that could potentially influence the results of the study. Ignoring certain factors in data analysis

can reduce the depth of understanding of the complexity of the problem being studied. By paying attention to these limitations, this research can become a basis for further, more comprehensive, and in-depth research in exploring the factors that influence the implementation of the Merdeka Curriculum in various school contexts in Indonesia.

4. CONCLUSION

The research concludes that there needs to be attention to implementing the independent learning curriculum or other curricula in multicultural school environments, both in terms of the use of learning models and learning strategies. The most important thing found in this research is the obstacles that arise because planning in the learning process is not carried out carefully by the teacher. Data shows a lack of planning in implementing the independent learning curriculum in high school. Starting from teaching materials in the form of modules that did not exist before, the methods and models used were not clear and by the students' abilities, the forms and methods of assessment did not yet exist, to the evaluation stage that respondents assessed did not yet exist. The findings in this research show that there are still teachers who experience difficulties in teaching according to the independent learning curriculum, teachers also admit difficulties in assessing the learning process of the independent learning curriculum. The interviewees were also in line and agreed with the findings of the research standard survey, that there was a need to improve teaching skills through training provided in the application of independent learning curriculum materials. Teachers also hope that there will be provision on how to prepare material equipped with learning models and methods, teachers also hope that there will be examples and training in preparing learning process assessment rubrics so that they become a strong basis for evaluating the learning process. The advantage of this research is that it has clearly illustrated the obstacles and difficulties of teachers in implementing an independent learning curriculum for students who have multicultural abilities in learning. The implication of this research is to provide input and correction to teachers in compiling, teaching, assessing, and evaluating the material being taught. The weakness of this research is that it is necessary to carry out experiments on models, methods, and ways of assessing the learning process by the independent learning curriculum and educational unit curriculum.

5. REFERENCES

Alalwan, N., Cheng, L., Al-Samarraie, H., Yousef, R., Alzahrani, A. I., & Sarsam, S. M. (2020). Challenges and prospects of virtual reality and augmented reality utilization among primary school teachers: A developing country perspective. *Studies in Educational Evaluation*, *66*, 100876. https://doi.org/10.1016/j.stueduc.2020.100876.

Andrade-Arenas, L., Nuñez, D. L., Sandoval, J. V., Perez, W. R., & Choquehuanca, E. G. (2022). Proposal of a Model for the Development of University Teacher Training Through Virtual Courses. *International Journal of Engineering Pedagogy*, *12*(3), 89–109. https://doi.org/10.3991/IJEP.V12I3.29497.

Ayanwale, M. A., Sanusi, I. T., Adelana, O. P., Aruleba, K. D., & Oyelere, S. S. (2022). Teachers' readiness and intention to teach artificial intelligence in schools. *Computers and Education: Artificial Intelligence*, *3*(June), 100099.1-11. https://doi.org/10.1016/j.caeai.2022.100099.

Bavaresco, M. V., D'Oca, S., Ghisi, E., & Lamberts, R. (2020). Methods used in social sciences that suit energy research: A literature review on qualitative methods to assess the human dimension of energy use in buildings. *Energy and Buildings*, *209*(2), 109702.1-49. https://doi.org/10.1016/j.enbuild.2019.109702.

Becker, S. P., Breaux, R., Cusick, C. N., Dvorsky, M. R., Marsh, N. P., Sciberras, E., & Langberg, J. M. (2020). Remote Learning During COVID-19: Examining School Practices, Service Continuation, and Difficulties for Adolescents With and Without Attention-Deficit/Hyperactivity Disorder. *Journal of Adolescent Health*, *67*(6), 769–777. https://doi.org/10.1016/j.jadohealth.2020.09.002.

Cabello, V. M., & Topping, K. J. (2020). Peer assessment of teacher performance. What works in teacher education? *International Journal of Cognitive Research in Science, Engineering and Education*, *8*(2), 121–132. https://doi.org/10.5937/IJCRSEE2002121C.

Calavia, M. B., Blanco, T., Casas, R., & Dieste, B. (2023). Making design thinking for education sustainable: Training preservice teachers to address practice challenges. *Thinking Skills and Creativity*, *47*(December 2021), 1-23. https://doi.org/10.1016/j.tsc.2022.101199.

Camilli Trujillo, C., Cuervo Calvo, L., García Gil, D., & Bonastre Valles, C. (2022). Mixed methods research in service-learning: an integrative systematic review. *Quality and Quantity*, *56*(4), 2361–2386. https://doi.org/10.1007/s11135-021-01218-3.

Cankurtaran, P., & Beverland, M. B. (2020). Using design thinking to respond to crises: B2B lessons from the

2020 COVID-19 pandemic. *Industrial Marketing Management*, *88*(May), 255–260. https://doi.org/10.1016/j.indmarman.2020.05.030.

Cattaneo, A. A. P., Boldrini, E., & Lubinu, F. (2020). "Take a look at this!". Video annotation as a means to foster evidence-based and reflective external and self-given feedback: A preliminary study in operati on room technician training. *Nurse Education in Practice*, *44*(March), 102770.1-7. https://doi.org/10.1016/j.nepr.2020.102770.

Costan, E., Gonzales, G., Gonzales, R., Enriquez, L., Costan, F., Suladay, D., Atibing, N. M., Aro, J. L., Evangelista, S. S., Maturan, F., Selerio, E., & Ocampo, L. (2021). Education 4.0 in developing economies: A systematic literature review of implementation barriers and future research agenda. *Sustainability (Switzerland)*, *13*(22), 1-22. https://doi.org/10.3390/su132212763.

Eltanahy, M., Forawi, S., & Mansour, N. (2020). Incorporating Entrepreneurial Practices into STEM Education: Development of Interdisciplinary E-STEM Model in High School in the United Arab Emirates. *Thinking Skills and Creativity*, *37*(July), 100697.1-9. https://doi.org/10.1016/j.tsc.2020.100697.

Gordon, J. A., Balta-Ozkan, N., Haq, A. U., & Nabavi, S. A. (2024). Heterogeneous preferences for living in a hydrogen home: an advanced multigroup analysis. *Sustainable Energy and Fuels*, *8*(12), 2601–2648. https://doi.org/10.1039/d4se00392f.

Greif, R., Bhanji, F., Bigham, B. L., Bray, J., Breckwoldt, J., Cheng, A., Duff, J. P., Gilfoyle, E., Hsieh, M. J., Iwami, T., Lauridsen, K. G., Lockey, A. S., Ma, M. H. M., Monsieurs, K. G., Okamoto, D., Pellegrino, J. L., Yeung, J., Finn, J. C., Baldi, E., … Zace, D. (2020). Education, Implementation, and Teams 2020: International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. In *Circulation* (Vol. 142, Issue 1). https://doi.org/10.1161/CIR.0000000000000896.

Guntur, M. I. S., & Setyaningrum, W. (2021). The Effectiveness of Augmented Reality in Learning Vector to Improve Students' Spatial and Problem-Solving Skills. *International Journal of Interactive Mobile Technologies*, *15*(5), 159–173. https://doi.org/10.3991/ijim.v15i05.19037.

Harder, N., Lemoine, J., & Harwood, R. (2020). Psychological outcomes of debriefing healthcare providers who experience expected and unexpected patient death in clinical or simulation experiences: A scoping review. *Journal of Clinical Nursing*, *29*(3–4), 330–346. https://doi.org/10.1111/jocn.15085.

Hong, Q. N., Pluye, P., Fàbregues, S., Bartlett, G., Boardman, F., Cargo, M., Dagenais, P., Gagnon, M. P., Griffiths, F., Nicolau, B., O'Cathain, A., Rousseau, M. C., & Vedel, I. (2019). Improving the content validity of the mixed methods appraisal tool: a modified e-Delphi study. *Journal of Clinical Epidemiology*, *111*, 49-59.e1. https://doi.org/10.1016/j.jclinepi.2019.03.008.

Kaasinen, E., Schmalfuß, F., Özturk, C., Aromaa, S., Boubekeur, M., Heilala, J., Heikkilä, P., Kuula, T., Liinasuo, M., Mach, S., Mehta, R., Petäjä, E., & Walter, T. (2020). Empowering and engaging industrial workers with Operator 4.0 solutions. *Computers and Industrial Engineering*, *139*(January 2019), 105678.1-13. https://doi.org/10.1016/j.cie.2019.01.052.

Kamil, P. A., Utaya, S., Sumarmi, & Utomo, D. H. (2020). Improving disaster knowledge within high school students through geographic literacy. *International Journal of Disaster Risk Reduction*, *43*(2), 101411. 1-17. https://doi.org/10.1016/j.ijdrr.2019.101411.

Kumar, V., & Rewari, M. (2022). A Responsible Approach to Higher Education Curriculum Design. *International Journal of Educational Reform*, *31*(4), 422–441. https://doi.org/10.1177/10567879221110509.

Liu, S., Liu, S., Liu, Z., Peng, X., & Yang, Z. (2022). Automated detection of emotional and cognitive engagement in MOOC discussions to predict learning achievement. *Computers and Education*, *181*(August 2021), 104461.1-16. https://doi.org/10.1016/j.compedu.2022.104461.

Luckin, R., Cukurova, M., Kent, C., & du Boulay, B. (2022). Empowering educators to be AI-ready. *Computers and Education: Artificial Intelligence*, *3*(2), 100076.1-11. https://doi.org/10.1016/j.caeai.2022.100076.

Mikalef, P., Boura, M., Lekakos, G., & Krogstie, J. (2019). Big data analytics and firm performance: Findings from a mixed-method approach. *Journal of Business Research*, *98*(July 2018), 261–276. https://doi.org/10.1016/j.jbusres.2019.01.044.

Moreira, M. A., Arcas, B. R., Sánchez, T. G., García, R. B., Melero, M. J. R., Cunha, N. B., Viana, M. A., & Almeida, M. E. (2023). Teachers' pedagogical competences in higher education: A systematic literature review. In *Journal of University Teaching and Learning Practice* (Vol. 20, Issue 1). https://doi.org/10.53761/1.20.01.07.

Oprescu, A. M., Miró-Amarante, G., García-Díaz, L., Rey, V. E., Chimenea-Toscano, A., Martínez-Martínez, R., & Romero-Ternero, M. C. (2022). Towards a data collection methodology for Responsible Artificial

Intelligence in health: A prospective and qualitative study in pregnancy. *Information Fusion*, *83–84*(March), 53–78. https://doi.org/10.1016/j.inffus.2022.03.011.

Owan, V. J., Chuktu, O., Dijeh, A. E., Zaafour, A., Ukah, J. U., Chukwurah, M. U., Ube, D. A., Asuquo, M. E., Uwase, E. U., Udida, U. J., & Ojong, C. O. (2023). Distance Education Students' Indulgence in Six Sharp Practices: General Linear Modelling of Predictive Parameters. *Turkish Online Journal of Distance Education*, *24*(3), 71–92. https://doi.org/10.17718/tojde.1138050.

Pérez-Ordás, R., Nuviala, A., Grao-Cruces, A., & Fernández-Martínez, A. (2021). Implementing service-learning programs in physical education; teacher education as teaching and learning models for all the agents involved: A systematic review. *International Journal of Environmental Research and Public Health*, *18*(2), 1–27. https://doi.org/10.3390/ijerph18020669.

Purwanto, B. E., Jatmiko, A., Pahrudin, A., Munifah, Wardhani, S., Purnama, S., & Joemsittiprasert, W. (2020). The implementation of cooperative learning to developed management of language learning system. *Journal for the Education of Gifted Young Scientists*, *8*(1), 379–392. https://doi.org/10.17478/jegys.675251.

Queiroz, C., Levy, M., Avramenko, R., Redman, E., Kearns, K., Swain, L., Silas, H., Uehlinger, F., & Gilleard, J. S. (2020). The use of ITS-2 rDNA nemabiome metabarcoding to enhance anthelmintic resistance diagnosis and surveillance of ovine gastrointestinal nematodes. *International Journal for Parasitology: Drugs and Drug Resistance*, *14*(September), 105–117. https://doi.org/10.1016/j.ijpddr.2020.09.003.

Reed, S. J. (2020). Measuring Learning and Engagement during Debriefing: A New Instrument. *Clinical Simulation in Nursing*, *46*(September 2020), 15–21. https://doi.org/10.1016/j.ecns.2020.03.002.

Rivera-Sotelo, N., Vargas-Del-Angel, R. G., Ternovoy, S. K., & Roldan-Valadez, E. (2021). Global research trends in COVID-19 with MRI and PET/CT: a scoping review with bibliometric and network analyses. *Clinical and Translational Imaging*, *9*(6), 625–639. https://doi.org/10.1007/s40336-021-00460-x.

Sgarbossa, F., Grosse, E. H., Neumann, W. P., Battini, D., & Glock, C. H. (2020). Human factors in production and logistics systems of the future. *Annual Reviews in Control*, *49*(April 2020), 295–305. https://doi.org/10.1016/j.arcontrol.2020.04.007.

Shim, T. E., & Lee, S. Y. (2020). College students' experience of emergency remote teaching due to COVID-19. *Children and Youth Services Review*, 119. https://doi.org/10.1016/j.childyouth.2020.105578.

Silva, R. M. F., Mendonça, C. R., Azevedo, V. D., Memon, A. R., Silva Noll, P. R. E., & Noll, M. (2022). Barriers to high school and university students' physical activity: A systematic review. *PLoS ONE*, *17*(4 April), 1–24. https://doi.org/10.1371/journal.pone.0265913.

Strijker, D., Bosworth, G., & Bouter, G. (2020). Research methods in rural studies: the use of mixed methods. *Journal of Rural Studies*, *78*(1), 262–270.

Stringer, T., Suarez, H., & Kim, A. M. (2023). Remoteness and other risk factors in circumpolar road accident severity. *Transportation Research Interdisciplinary Perspectives*, *21*(August), 100898.1-10. https://doi.org/10.1016/j.trip.2023.100898.

van Dijk, E. E., van Tartwijk, J., van der Schaaf, M. F., & Kluijtmans, M. (2020). What makes an expert university teacher? A systematic review and synthesis of frameworks for teacher expertise in higher education. *Educational Research Review*, *31*(October), 100365.1-16. https://doi.org/10.1016/j.edurev.2020.100365.

Wildenbos, G. A., Jaspers, M. W. M., Schijven, M. P., & Dusseljee-Peute, L. W. (2019). Mobile health for older adult patients: Using an aging barriers framework to classify usability problems. *International Journal of Medical Informatics*, *124*(May 2018), 68–77. https://doi.org/10.1016/j.ijmedinf.2019.01.006.

Wong, K. Y., Sulaiman, T., Ibrahim, A., Kunchi Mohd, A. G., Hassan @ Hussin, O., & Wan Jaafar, W. M. (2021). Secondary school teachers psychological status and competencies in e-teaching during Covid-19. *Heliyon*, *7*(11), e08238.1-8. https://doi.org/10.1016/j.heliyon.2021.e08238.

Wullschleger, A., Garrote, A., Schnepel, S., Jaquiéry, L., & Moser Opitz, E. (2020). Effects of teacher feedback behavior on social acceptance in inclusive elementary classrooms: Exploring social referencing processes in a natural setting. *Contemporary Educational Psychology*, *60*(January), 101841.1-12. https://doi.org/10.1016/j.cedpsych.2020.101841.

Yusop, S. R. M., Rasul, M. S., Yasin, R. M., Hashim, H. U., & Jalaludin, N. A. (2022). An Assessment Approaches and Learning Outcomes in Technical and Vocational Education: A Systematic Review Using PRISMA. *Sustainability (Switzerland)*, *14*(9), 1–18. https://doi.org/10.3390/su14095225.

Zhang, Y., Dai, H., Yun, Y., Liu, S., Lan, A., & Shang, X. (2020). Meta-knowledge dictionary learning on 1-bit response data for student knowledge diagnosis. *Knowledge-Based Systems*, *205*(October 2020), 106290.1-13. https://doi.org/10.1016/j.knosys.2020.106290.