Analysis of Biology Teacher Perceptions of the Independent Curriculum at DKI Jakarta Mobilization Schools

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Abstract. This study to describe the implementation of the independent curriculum in "sekolah penggerak" in DKI Jakarta. This research method uses descriptive. This research was conducted in DKI Jakarta "sekolah penggerak" from March to June 2022. The population in this study was 11 high schools (SMA) in DKI Jakarta which were used as "sekolah penggerak". The sampling technique was carried out by purposive sampling. The sample chosen in this study was in accordance with the willingness of respondents based on the population, namely SMAN 86 Jakarta, SMAN 50 Jakarta, SMAN 109 Jakarta, SMAN 71 Jakarta, SMAN 21 Jakarta. The instruments used were open interviews and questionnaires with indicators of independent curriculum implementation, 21st century skills, local wisdom/ethnoscience, application of learning strategies, project-based learning. The data analysis technique used the guttman scale and narrative approach and was assisted by the SPSS 21 application. The results showed that 96.66% of the teachers had implemented and understood the independent curriculum, 62% had integrated local wisdom themes, 21st century skills 95% of teachers had understood and were able to improve their skills In the 21st century, the understanding that the teacher's learning strategy in the independent curriculum has a result of 40%, the application of project-based learning is already 73.33%. So, it can be concluded that the teacher's understanding of curriculum changes from the 2013 curriculum to the independent curriculum already understands well, it's just that the integration of local wisdom into teacher learning is still not able

Keywords: curriculum changes, independent curriculum, ethnoscience

1 Introduction

The curriculum will continue to change and the changes are always influenced by the underlying factors[1][2]. The curriculum can change if there is a new paradigm regarding the learning process so that a curriculum that is appropriate and relevant to changes in society is formed. Basically, curriculum changes have good and bad impacts on the quality of education, good impacts on students can learn by following the development of increasingly advanced times. Teachers must have quality so that they are able to facilitate students in learning and students are able to understand and use the teacher as a facilitator[3][4]. The bad impact for the world of education in Indonesia is that the quality of education decreases and changes in the curriculum that are too fast result in new problems such as a decrease in students' academic scores, this is because students are not able to adjust to the changing conditions of learning in the curriculum system[5][6]. The positive and negative sides of this curriculum change naturally

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occur because there are new things that are happening, the unpreparedness of educators, parents and students needs to be a common concern for the smooth running of the educational process[7][8]. If that's done, then basically changing the curriculum is not a problem, it's just that habituation and a change in way of thinking are needed[9][10].

The independent curriculum, through the Pancasila student profile, is a new order that is important to understand and implement as a solution to various kinds of challenges and changes at this time[11][12]. The concept of implementing an independent curriculum is very important to understand together. The learning process in the independent curriculum is a form of student-oriented learning. Independence in learning gives freedom and autonomy to educational institutions and is free from bureaucratization and students are given the freedom to choose the fields they like[13][14]. The implementation of the independent curriculum in schools provides an opportunity for students to develop 21st century skills, namely creativity, innovation, and make individuals who are independent and have positive character [15][16].

Problem solving, creative, critical thinking, and innovative skills are skills in the 21st century. 21st century skills consist of communication skills, critical thinking and problem solving, as well as being creative and innovative. These skills need to be implemented by teachers and students in learning so that the quality of learning increases [17][18]. This independent curriculum is based on project-based learning guided by the Pancasila student profile[19]. Character is the main pillar to be nurtured, because the influence of this character has implications for the strength and sovereignty of the State to be more advanced and qualified and have a positive impact on the world. This new paradigm must be supported and implemented in schools and learning, so as to produce the expected outputs and outcomes as expected by national education goals [20][21].

Research on government policies, especially in the field of curriculum, is very important to study. Many researchers have discussed studies regarding curriculum implementation and changes, such as the new paradigm in the prototype curriculum [22], the application of the curriculum during a pandemic [15], an analysis of the implementation of the independent learning curriculum at the Nusa Bangsa University biology study program [23][24], independent learning curriculum innovation in the era of 5.0 society [25]. Although research on implementation and curriculum has been carried out by many researchers in Indonesia. However, there is still little that discusses the implementation of the independent curriculum in schools and how to apply the essence of the curriculum to biology learning[26][27]. For this reason, this study aims to describe teachers' perceptions of the independent curriculum in driving schools in DKI Jakarta[28].

2 Research Methods

The method used in this research is descriptive method, which examines problems in the form of facts from the population. According to Sugiyono [29] the descriptive method is a method used to analyze by describing and describing the data that has been collected as it is[30]. This study aims to describe teachers' perceptions of the independent curriculum in DKI Jakarta driving schools. This research was conducted from March to June 2022[31]. The location of the research was carried out at the driving schools of DKI Jakarta. The population in this study was 11 high schools (SMA) in DKI Jakarta which were used as driving schools.

Sampling was done by purposive sampling based on the willingness of respondents. Biology teachers and students at DKI Jakarta driving schools were selected as samples according to the

research objectives so that they could represent the research objectives. Purposive sampling is a sampling technique that has been considered and determined according to Sugiyono [32]. The sample chosen was in accordance with the willingness of respondents based on the population, namely SMAN 86 Jakarta, SMAN 50 Jakarta, SMAN 109 Jakarta, SMAN 71 Jakarta, SMAN 21 Jakarta. The sample characteristics of the respondents who were taken were those who taught in class X at the driving school and students who were taught in class X.[33]

In obtaining data regarding the integration of ethnoscience in learning, the researcher used the Interview/Interview technique which was conducted in an open interview so that it did not limit the explanations or opinions of the informants. Open interviews were conducted to take indicators of the implementation of the independent curriculum, local wisdom, 21st century skills, learning strategies, and PjBL. The questionnaire is part of data acquisition by using a questionnaire sheet which is filled in by class X teachers and class X students at DKI Jakarta driving schools. For indicators taken using a questionnaire on students, namely, local wisdom and project-based learning (PjBL)[34].

The data analysis technique used in this study uses the Guttman Scale. The Guttman scale is a cumulative measurement scale that only measures one dimension of a multi-dimensional variable. This scale produces a firm answer, namely "yes-no".

Table 1. Gutttman scale

No.	Score	Information
1.	2	YES
2.	1	NO

There are two approaches in the data analysis technique used, namely the first with a qualitative approach, the interview data were analyzed using a narrative approach. The second is a quantitative approach: data analysis used to process a questionnaire assisted by the SPSS 21 application. The validity test used in this study uses construct validity. Construct validity is validity that uses the opinion of experts. With experts in accordance with the scope of research

3 Results and Discussion

3.1 Independent curriculum implementation

Table 2. Perception about curriculum independent

No.	Statement	Respondent	Yes	No
1	P1	5	100.0	0
2	P2	5	80.0	20.0
3	P3	5	100.0	0
4	P4	5	100.0	0
5	P25	5	100.0	0
6	P26	5	100,0	0

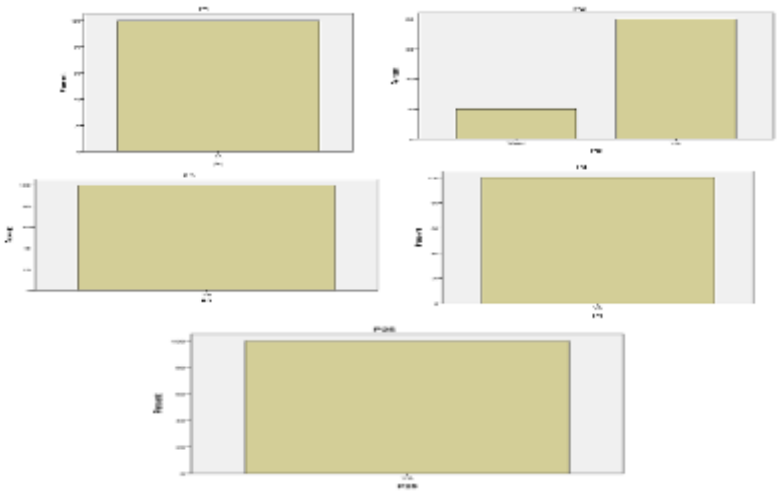

Fig. 1. Perception about curriculum independent

The results of this study indicate that mobilizing schools in Jakarta have implemented an independent curriculum but through this research it shows there is still a lack of knowledge about ethnoscience and an in-depth understanding of Betawi culture through questionnaires that have been distributed and filled out by teachers and students at mobilizing schools. Based on table 4.1, teachers in Jakarta driving schools have implemented an independent curriculum. The independent curriculum is a curriculum with a variety of intracurricular learning where the content becomes optimal so that students are expected to have enough time to deepen concepts and strengthen competencies [35] In the table discussing indicators of implementing the independent curriculum obtained in Statement 1 (P1) all teachers stated that the school has implemented an independent curriculum with 100% results in statement 1. This is reinforced by research conducted [36] that in changing the curriculum, the teacher's role is to implement the existing curriculum and act as an alignment of the curriculum with the characteristics of students and their needs[37].

Based on the table above, it explains that 80% of teachers in driving schools understand the concept of the independent curriculum. It is supported by research conducted by [38] that teachers will try to develop professionalism by participating in training organized to properly apply the independent curriculum and develop project-based learning models. The independent curriculum is the latest curriculum which has the concept that students and teachers are able to contribute and learn freely on a project-based basis based on real environmental conditions. So that independent literacy is needed because education is prepared to be able to anticipate various kinds of problems that exist in society [25]. Therefore, understanding the concept of an independent curriculum needs to be done for learning and implementing a good independent curriculum.

In table statement 3 (P3) regarding the project-based model used this is in accordance with the independent curriculum where learning is carried out project-based. In the independent curriculum, the learning model used in mandatory learning is project-based, so that based on the

table data above it shows that 5 biology teachers in 5 driving schools have implemented a project-based learning model with 100% data results for using this model in learning and also as a whole. Referring to student perceptions in table 4.10 there were 161 students out of 173 students from 5 schools namely 93.1% stated that learning had been carried out on a project basis. Strengthened through research conducted [39] that project-based learning increases students' attitudes of scientific responsibility and increases attitudes and enthusiasm for learning science.

Every time implementing the curriculum in learning, it is necessary to do an evaluation. Evaluation is carried out by providing assessments, assessments on the independent curriculum are carried out authentically starting from planning, implementation, processing and feedback. So that all competencies both cognitive, attitudinal and psychomotor can be measured properly. Assessment is important in the educational process [40]. Referring to the table above regarding statement 4 (P4) that the teacher evaluates the independent curriculum. The assessments given by the teacher to carry out evaluations are summative and formative assessments. The teacher's formative assessment makes a guide in the learning process, looks for evidence related to mastery in learning, gradually uses feedback, and details the results of student assessments so that the teacher knows student learning progress[41][42].

Assessment on the independent curriculum is carried out authentically, starting from planning, implementation, processing and feedback. So that all competencies both in terms of cognitive, attitudinal and psychomotor can be measured properly[43]. Referring to statement table 26 that 100% of teachers have conducted an assessment of the independent curriculum. Teachers understand the assessments in the independent curriculum, namely formative assessments and summative assessments[44]. In the results of the interview the teacher also understands the importance of formative assessment to be carried out. There is an assessment that is not mentioned, namely a diagnostic assessment, namely a diagnostic test that is used to diagnose the condition of students so that it can be used to determine the right strategy. Before there was a change in the assessment curriculum, which was often given by teachers, there was a summative assessment [45][46].

Table 3. Integration of local wisdom themes in the independent curriculum

No.	Question	Respondents	Yes	No
1	P5	5	80.0	20.0
2	P6	5	100.0	0
3	P7	5	60.0	40.0
4	P9	5	20.0	80.0
5	P10	5	80.0	20.0
6	P11	5	60.0	40.0
7	P12	5	40.0	60.0
8	P13	5	80.0	20.0
9	P14	5	60.0	40.0
10	P15	5	40.0	60.0

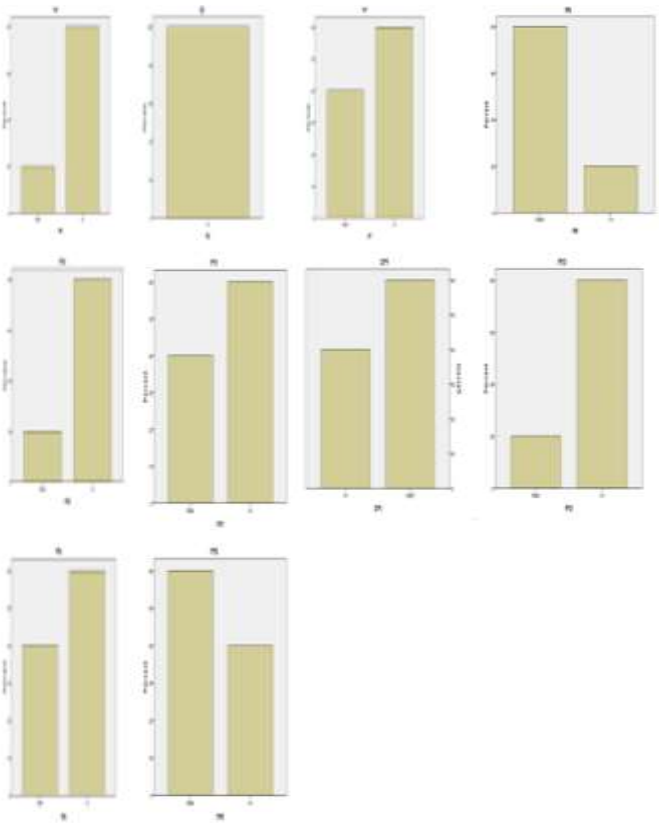

Fig. 2. Integration of local wisdom themes in the independent curriculum

In the independent curriculum there is one important theme, namely local wisdom where this local wisdom needs to be integrated into a lesson. Based on table 4.2 regarding indicators of local wisdom producing 62% this shows that teachers are still unable to integrate into biology learning. So that local wisdom is separated from learning biology, in this case the teacher has understood that local wisdom is an important theme in efforts to preserve culture, know cultural heritage and learner's independence in interacting with the community environment. In table statement 5 (P5) above it is stated that the teachers who teach at the Jakarta driving school already understand and know enough about Betawi culture, only 20% do not know what Betawi culture is itself. Betawi culture itself is a culture that exists in the people of DKI Jakarta, of course the theme of local wisdom in the independent curriculum refers to the culture around the school environment. As a driving school located in the Jakarta area, the local wisdom that needs to be applied is Betawi culture. Looking at the data results table above, it can be seen that 80% of teachers have understood Betawi cultural knowledge because many teachers have a Betawi background. Strengthened through research [47] that Betawi culture has the potential as an alternative to learning biology. Referring to the student perception data table, 88.4% of students stated that the learning was oriented to local wisdom[48].

Local wisdom is considered very effective in providing life values and a system of truth in the form of awareness that is easily absorbed by students. Because it is supported by the community environment. Based on data from 5 teachers, only 1 teacher applied or integrated local wisdom into science learning. In applying local wisdom in learning, there are three strategies [17], namely:

1. General learning, the teacher integrates cultural values into the group system or becomes the basis for learning syntax activities
2. Embedded learning, teachers integrate cultural values into learning materials or content on certain topics.
3. Mixed learning, teachers integrate culture by combining content and learning approaches.

In addition to the above strategies, there are four learning strategies for integrating ethnoscience [49], namely:

1. Trailored teaching strategy
2. Culturally responsive teaching (CRT)
3. Culturally responsive transformative teaching (CRTT)
4. ESD-based pedagogical approaches

Ethnoscience is a new term for biology teachers in driving schools referring to the results of the questionnaire data above that some teachers do not understand ethnoscience. Teachers have understood that local wisdom is an important theme in efforts to preserve culture, know cultural heritage and learner independence in interacting with the community. Seen in table P10 shows that 80% of teachers have an understanding that local wisdom is an important theme in learning, which in biology learning with local wisdom helps teachers and students understand the material through real examples in the surrounding environment so that it is relevant to students . According to [50] the existence of local wisdom in learning can be a filter for various global aspects that enter various aspects of people's lives. Local wisdom can encourage teachers and students to create creative and innovative learning.

Based on the results of the data table 2 explains that local wisdom is important in a lesson. However, teachers are still not able to integrate into biology learning. So that local wisdom is separated from learning biology, in this case the teacher has understood that local wisdom is an important theme in efforts to preserve culture, know cultural heritage and learner's independence in interacting with the community. In line with research [51] local wisdom needs highlighted in the education system and practice in schools.

Indonesia has a wide culture and social diversity, one of the cultures found in Indonesia is the Betawi culture, which is an original culture originating from the DKI Jakarta area. The current government has done a lot to preserve Betawi culture, one of which is currently in the field of education including the theme of local wisdom, of course in Jakarta schools the local wisdom that is applied is Betawi culture. Based on the table above, it shows that only 40% associate Betawi culture in learning, this happens because only one teacher has a background in Betawi society and only one teacher understands and knows the values of existing Betawi culture so that in associating Betawi culture in learning still a problem in some schools[52][53].

Ethnoscience is a new term for biology teachers in learning. Referring to the table above, some teachers do not understand the term. However, there are teachers who know the meaning of the term ethnoscience and express the meaning of the term ethnoscience as "... science associated with culture". With the results of the data 40% of teachers understand the concept of ethnoscience. This result is also reinforced by research conducted by [54] that biology teachers do not yet have adequate knowledge about ethnoscience[55].

3.2 21st century skills

Table 4. Perception biology teacher about 21st century skills

NO.	Statement	Respondent	Yes	No
1	P18	5	100.0	0
2	P19	5	100.0	0
3	P20	5	100.0	0
4	P21	5	80.0	20.0

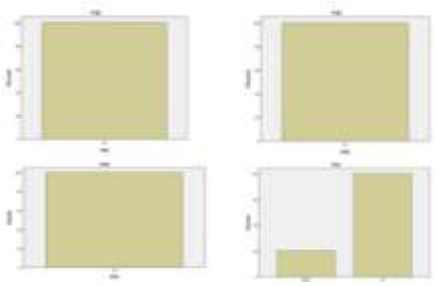

Fig. 3. Perception biology teacher about 21st century skills

21st century skills in the independent curriculum are included in the dimensions of the Pancasila profile, 21st century skills such as creative, critical, collaborative and innovative thinking need to be instilled and enhanced through learning. In learning 21st century skills need to be developed with the aim that these skills can become a provision for students in society so that they become quality human beings. Based on table 4.3, it shows that 100% of teachers understand the 21st century skills which in the independent curriculum enter the dimensions of the Pancasila profile.

Based on table 3 in line with the results of statement 18 where the teacher has understood 21st century skills, statement 19 above shows 100% results for teachers being able to improve 21st century skills in students. This is because teachers understand 21st century skills. 21st century in learning in line with the curriculum concept.

Assessment on the independent curriculum is carried out authentically starting from planning, implementation, processing and feedback. In improving and developing 21st century skills it is necessary to carry out an evaluation which is carried out to improve students' 21st century skills and develop the quality of students for society in the future. Referring to table 4.3 statement 20 that 100% of teachers carry out evaluations in developing students' 21st century skills.

Referring to table 4.3 that there are difficulties in developing 21st century skills with 80% data that teachers still have difficulties in developing students' 21st century skills. 21st century learning skills are important skills that must be mastered by students in this century and in the future. Even though there are difficulties in developing it the teacher tries to develop it through learning. Because according to research results[56][57]education in this century is very important for students to master 21st century skills as a support in learning and used in life by utilizing technology and information media[58].

3.3 Understanding of teacher learning strategies in the independent curriculum

Table 5. Perception biology teacher about strategies in the independent curriculum

No.	Statement	Respondent	Yes	No
1	P16	5	20.0	80.0
2	P8	5	40.0	60.0
3	P17	5	60.0	40.0

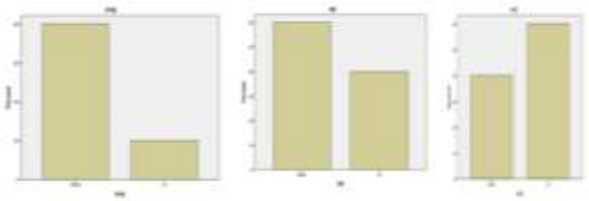

Fig. 4. Perception biology teacher about strategies in the independent curriculum

Based on table 4 in statement 16 above, it shows that teachers still do not fully understand ethnoscience because only one teacher from 5 schools knows the ethnoscience category in learning strategies. In the independent curriculum the learning model used in learning is required to be project-based. Project-based learning is a learning model in which students learn by investigating complex problems and constructing a solution. Based on the results of data analysis table 4.4 shows that 40% of teachers always use projects in learning, this is in line with the implementation of the independent curriculum in schools which require project-based learning while 60% of teachers do not always provide project-based learning. This happens because not all materials can always be assigned by project award because they can use other models. Because projects in biology material are very important to do in assignments because they have a big impact on the mindset of students where students investigate a problem and challenge which then constructs a solution to the problem and the right solution[59][60].

Referring to statement 15 and 16 data regarding ethnoscience in accordance with statement 17 which in table P17 above states that the application of ethnoscience in learning is only carried out by a few teachers, this is because the teacher's understanding of ethnoscience is still inadequate and still needs to be improved. In accordance with the results of the interviews that there is one teacher who applies it to learning[61][62]. However, it is only limited to assignments to students and has not been integrated into their learning. "..., for now, biology has not yet implemented local wisdom into learning materials, but at this school local wisdom is applied in the form of projects because the characteristic of this curriculum is project-based. The project at this school was carried out in collaboration with all subject teachers," was the teacher's statement in the interview

3.4 Application of the project-based learning model (PjBL)

Table 6. Perception biology teacher about application of PjBL

	Statement	Respondent	Yes	No
1	P23	5	80.0	20.0
2	P22	5	40.0	60.0
3	P24	5	100.0	0

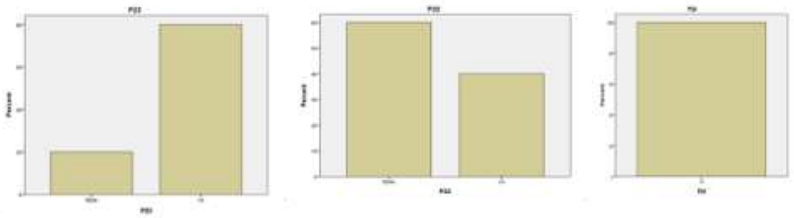

Fig. 5. Perception biology teacher about application of PjBL

Material in learning needs to be provided in an interesting way and makes it easy for students to understand it, through an independent curriculum with project-based learning students can do literacy independently of existing problems and find solutions to solve problems. In the research conducted [63] shows that project-based learning helps students to form mindsets and analyzes in thinking to solve problems in various situations. Referring to statement table 22 that not all biology materials can be used as project assignments in accordance with the teaching materials provided and the objectives to be achieved.

Based on statement table 5 that 80% of students when given assignments or project-based learning, students are able to complete them well. Projects in biology material are very important to do in assignments because they have a big impact on the mindset of students where students investigate a problem and challenge which then constructs a solution to the problem and the right solution. In line with research [64] the cognitive abilities and creative thinking of students in the implementation of PjBL achieve good criteria with the highest achievement on indicators of explaining concepts and viewing information from different perspectives. Multidisciplinary science is a research strategy that involves at least two academic disciplines to simultaneously solve a particular problem [65][66]. Referring to table 4.5 statement 24 that teachers have 100% implemented PjBL which is based on multidisciplinary knowledge. The PjBL model was chosen because it is classified as a learning model that can guide students to improvise, provide solutions to overcome problems, look for alternatives so they can be resolved [67][68].

4 Conclusions

Curriculum changes from time to time is finding the ideal curriculum. Every change that goes through the curriculum is inseparable from the factors of the government, society, and developments in science and technology. In essence, curriculum changes are to improve the

quality of education in a better direction. With this curriculum change, the learning process also changes so that the curriculum changes are in line with national education goals. Curriculum changes make teachers must be prepared to face them by increasing the level of professionalism by acting as implementers of the new curriculum in schools and adjusting students.

Through the results of the research that has been done, it can be concluded that the teacher's perception of the independent curriculum is positive and gets very good appreciation from the teachers. This can be seen through the results of questionnaires and interviews, namely, teachers have understood curriculum changes, changes to the 2013 curriculum towards an independent curriculum, teachers have understood the importance of local wisdom, but have not been able to implement local wisdom into biology learning. The project-based learning model is in accordance with the main focus in the independent curriculum. Teachers carry out assessments in various ways, there are formative and summative assessments and assessments can be carried out through given project assignments, but the teacher has not implemented a diagnostic test. In line with the concept of an independent curriculum which gives freedom to teachers and students to innovate and think creatively.

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