Evaluation of The Science Project Learning Program Through the Countenance Stake Model at SMKN 2 Kendari

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ABSTRACT:

This study was motivated by the implementation of the Merdeka Curriculum in the Natural and Social Sciences Project (Projek IPAS) subject at vocational high schools, which emphasizes project-based, contextual, and industry-relevant learning. Program evaluation is necessary to assess the effectiveness of Projek IPAS implementation in achieving learning objectives and strengthening the Profile of Pancasila Students. The purpose of this study was to evaluate the implementation of Projek IPAS learning for tenth-grade students at SMKN 2 Kendari using the Countenance Stake evaluation model, which consists of antecedent, transaction, and outcomes components. This research employed an evaluative approach with a descriptive qualitative method. Data were collected through observations, interviews, documentation, and questionnaires, and analyzed through data reduction, data presentation, and conclusion drawing. The findings revealed that the antecedent stage, including curriculum design, teaching modules, teacher competence, student characteristics, and learning facilities, was categorized as good. However, several challenges were identified, including limited laboratory facilities, the need for improved development of Learning Objective Flow (ATP), and insufficient involvement of business and industrial partners. At the transaction stage, Projek IPAS learning was implemented effectively through Project-Based Learning strategies, the utilization of various instructional media, and active student participation. At the outcomes stage, students demonstrated excellent learning achievement with an average score of 85, exceeding the Minimum Learning Achievement Criteria (KKTP) of 78. The study concludes that the implementation of Projek IPAS learning at SMKN 2 Kendari has been effective and aligned with the principles of the Merdeka Curriculum. Nevertheless, improvements are needed in learning facilities, teacher capacity development in instructional planning, and collaboration with business and industry sectors to enhance the relevance and quality of Projek IPAS learning in vocational education.

 Keywords: Program Evaluation, Projek IPAS, Merdeka Curriculum, Countenance Stake, Vocational High School.

Introduction. The implementation of the Independent Curriculum is one of the Indonesian government's strategic policies to realize more flexible, student-centered learning, and develop competencies aligned with 21st-century needs. At the Vocational High School (SMK) level, the implementation of the Independent Curriculum is aimed at producing graduates with a balance between mastery of knowledge, skills, and character by strengthening the Pancasila Student Profile. One subject that plays a crucial role in supporting this goal is the Natural and Social Sciences (IPAS) Project, which integrates science and social concepts through project-based learning, enabling students to develop critical, creative, and collaborative thinking skills and solve problems relevant to the world of work.

Although the Independent Curriculum has been gradually implemented in various educational institutions, its implementation in vocational schools still faces various challenges. Teachers are required to independently develop teaching modules, implement project-based learning, utilize innovative learning media, and conduct assessments in accordance with the characteristics of the Independent Curriculum. On the other hand, limited teacher competency, learning facilities and infrastructure, laboratory availability, and the involvement of the Business and Industry (DUDI) in the delivery of learning remain obstacles affecting the effectiveness of the Science and Education Project in schools.

SMKN 2 Kendari is one of the schools that has fully implemented the Independent Curriculum. However, initial observations revealed several challenges in the implementation of the Science and Education Project, including the suboptimal development of the Learning Objectives Flow (ATP), limited flexibility in project implementation time, the lack of standardized assessment instruments, and the suboptimal involvement of DUDI in aligning project themes with workplace needs. These conditions indicate that the success of curriculum implementation is not solely determined by the availability of curriculum documents but also by the quality of the learning process and student outcomes.

To obtain a comprehensive picture of the implementation of the Science and Education Project, a program evaluation is required that can comprehensively assess the planning, process, and learning outcomes. The Countenance Stake evaluation model was chosen because it can evaluate the program through three main components: antecedents, transactions, and outcomes. This model can identify the alignment between established standards and implementation in the field, thereby providing accurate information on the strengths, weaknesses, and aspects that need improvement in the implementation of the Science and Education Project within the Independent Curriculum.

Based on this description, this study aims to: 1) Evaluate the results of the Science and Education Project learning program evaluation at the antecedents stage at SMKN 2 Kendari. 2) Evaluate the results of the Science and Education Project learning program evaluation at the transactions stage at SMKN 2 Kendari. 3) Evaluate the results of the Science and Education Project learning evaluation at the outcomes stage at SMKN 2 Kendari. The results of this study can provide empirical information regarding the effectiveness of the Science and Education Project implementation and serve as a basis for schools, teachers, and policymakers in formulating strategies to improve the quality of the implementation of the Independent Curriculum, particularly in Science and Education Project learning in Vocational High Schools.

Theoretical Study

A. Independent Curriculum and Science Project Learning

The Independent Curriculum is an educational policy designed to provide flexibility to educational units in developing learning processes tailored to student characteristics, learning environment conditions, and community needs. This curriculum places students at the center of learning (student-centered learning) by providing teachers with more space to develop innovative learning strategies. In addition to focusing on competency mastery, the Independent Curriculum also emphasizes character building through the Pancasila Student Profile, ensuring that graduates possess not only academic abilities but also the attitudes, values, and skills needed in society and the workplace.

At the Vocational High School (SMK) level, the implementation of the Independent Curriculum is aimed at producing graduates who are able to adapt to developments in science, technology, and the needs of the Business and Industrial World (DUDI). Therefore, the learning process is no longer solely focused on mastering material but rather emphasizes contextual, collaborative, and problem-solving-based learning experiences. Teachers are given the flexibility to develop learning materials, select methods, and develop assessments appropriate to student characteristics and the competencies being studied.

One subject that plays a crucial role in the implementation of the Independent Curriculum in vocational schools is the Natural and Social Sciences (IPAS) Project. This subject integrates natural and social sciences, developed through project-based learning. Through this approach, students are encouraged to identify real-world problems, conduct investigations, work collaboratively, and produce solutions or products relevant to both everyday life and the field of expertise being studied.

With these characteristics, the IPAS Project is expected to develop critical thinking, creativity, communication, collaboration, and systematic problem-solving skills. The success of the IPAS Project learning implementation depends not only on the curriculum used but also on teacher readiness, the availability of facilities and infrastructure, school management support, and the involvement of various stakeholders. Therefore, the implementation of the IPAS Project needs to be continuously evaluated to ensure the objectives of the Independent Curriculum are optimally achieved.

Educational Program Evaluation Using the Countenance Stake Model

Program evaluation is a systematic process for collecting, analyzing, and interpreting information regarding the implementation of a program as a basis for determining its success and providing recommendations for decision-making. In education, evaluation not only measures student learning outcomes but also assesses the quality of planning, implementation, and impact of learning programs, identifying aspects that need to be maintained or improved.

One evaluation model widely used in educational research is the Countenance Stake Evaluation Model, developed by Robert E. Stake. This model emphasizes the importance of comparing actual conditions in the field with established standards or criteria. Thus, evaluation not only provides information on the program's success but also identifies gaps between planning and implementation, allowing appropriate corrective measures to be formulated.

The Countenance Stake Model consists of three main components: antecedents, transactions, and outcomes. The antecedents component evaluates the initial conditions that support program implementation, such as the curriculum, teaching modules, teacher competencies, student characteristics, and facilities and infrastructure. The transactions component focuses on the learning process, including learning strategies, teacher-student interactions, media use, and assessments. The outcomes component evaluates the results achieved, both in terms of the achievement of learning objectives and the program's impact on improving student competency.

The advantage of the Countenance Stake model lies in its ability to evaluate a program comprehensively, from the planning stage to the results. This model also provides more comprehensive information because it considers the relationship between initial conditions, the implementation process, and the final results of the program. Therefore, the Countenance Stake model is considered suitable for evaluating the implementation of the Science and Science Project within the Independent Curriculum, as it provides a comprehensive picture of the program's effectiveness and serves as a basis for developing recommendations for improvement.

Implementation of the Science and Science Project in the Independent Curriculum in Vocational High Schools

The Science and Science Project is one form of the Independent Curriculum, which aims to integrate knowledge, skills, and attitudes through project-based learning activities. In its implementation, students are given the opportunity to learn through real-world experiences by connecting scientific and social concepts to various problems in their environment. This approach is expected to enhance higher-order thinking skills, creativity, communication, collaboration, and independent problem-solving abilities.

The success of the Science and Science Project implementation is influenced by various factors, both internal and external to the school. Internal factors include teacher competence, student readiness, the quality of teaching modules, learning strategies, and the availability of facilities and infrastructure. Meanwhile, external factors include the support of the principal, government policies, parental involvement, and collaboration with the Business and Industry World (DUDI). The synergy between these factors determines the success of project-based learning in vocational high schools.

In practice, the implementation of the Science and Science Project still faces various challenges. Some frequently encountered obstacles include limited laboratory facilities, suboptimal development of Learning Objective Flows (ATP), limited learning media, suboptimal use of digital technology, and limited involvement of the Industrial and Industrial Industries (DUDI) in aligning project themes with workplace needs. These conditions can impact the quality of learning and student competency achievement if not addressed promptly.

Therefore, evaluating the implementation of the IPAS Project is a crucial step in determining the program's success and identifying any remaining obstacles. Evaluation results can serve as the basis for developing strategies to improve learning quality, strengthen teacher competencies, provide adequate facilities and infrastructure, and develop partnerships with the Industrial and Industrial Industries (DUDI). Therefore, the implementation of the IPAS Project is expected to support the achievement of the Independent Curriculum goals and produce competent, adaptable vocational school graduates who are ready to face the challenges of the workplace.

Methods

This research is an evaluation research. Evaluation research focuses on a selected phenomenon for in-depth understanding, ignoring other phenomena. This evaluation study applies the Countenance Stake evaluation model developed by Robert E. Stake. This model was chosen because it can comprehensively evaluate a program through three main components: antecedents, transactions, and outcomes. This approach was used to obtain a comprehensive picture of the implementation of the Natural and Social Sciences (IPAS) Project learning within the Independent Curriculum for 10th-grade students at SMKN 2 Kendari, from the planning stage through implementation to learning outcomes.

The research was conducted at SMKN 2 Kendari, Southeast Sulawesi. Research informants were selected using purposive sampling, based on the consideration that they had knowledge and direct involvement in the implementation of the IPAS Project. Informants consisted of the principal, vice principal for curriculum, IPAS Project subject teachers, and 10th-grade students. Research data were obtained through

questionnaires, observations, interviews, and documentation studies.

Data analysis was conducted in two stages: 1) Quantitative data analysis, consisting of student and teacher questionnaires. 2) Qualitative data analysis, consisting of interviews, observations, and documentation. With these procedures, the research results are expected to provide a valid and comprehensive picture of the effectiveness of the implementation of the Science Project in supporting the Independent Curriculum at SMKN 2 Kendari.

Results

Evaluation of the Science and Science Project Learning Program at the Antecedents Stage

The evaluation results at the antecedents stage indicate that the implementation of the Science and Science Project at SMKN 2 Kendari has generally been in the good category. The components evaluated included the curriculum, teaching modules, teacher competencies, student characteristics, and learning facilities and infrastructure.

The curriculum component of the Science and Science Project at SMKN 2 Kendari demonstrated a successful macro-managerial transition, with the full implementation of the Independent Curriculum at all levels in the 2025/2026 academic year. Administratively and documentally, the school's governance was deemed mature (average cumulative score of 2.95/Good Category), as indicated by the clarity of the Science and Science Project structure in the KOSP document (score of 3.50) and the strong integration of the Pancasila Student Profile (P3) dimensions (score of 3.67). This success confirms that the legal basis and policy direction for integrated science and social studies teaching in grade 10 have been explicitly accommodated and aligned with the school's vision and mission. Despite good administrative practices at the school, this evaluation identified significant operational gaps in the classroom. The main challenges stem from limited independent training, which leads teachers to copy and paste from the internet, resulting in low flexibility in allocating teaching time (score 2.83), confusion in converting CP into operational ATP (score 2.83), and a lack of standardized assessment guidelines (score 2.67). This situation is exacerbated by the minimal involvement of industry and industry stakeholders in aligning the themes (score 2.67). Therefore, interventions such as independent workshops for developing teaching materials and optimizing industry collaboration are recommended to transform the Science and Science Project into a prototype solution that is applicable and relevant to the workplace.

The Teaching Module aspect of the Science and Science Project for Grade 10 at SMKN 2 Kendari demonstrates administrative success in adapting from the previous Lesson Plan model to the Independent Curriculum format (average accumulated score of 3.23/Good category). The educators demonstrated excellence in contextualizing the project theme based on local environmental and social issues in the Kendari region (score 3.83) and completing the mandatory module components in detail (score 3.67). Furthermore, the formulation of measurable Learning Objectives (TP) and the syntactic visualization of Project Based Learning (PjBL) were very well designed (score 3.33), illustrating that the teachers with linear scientific backgrounds were able to systematically plan scientific work steps. Behind these achievements, this evaluation revealed several procedural and substantial weaknesses that require immediate follow-up. The main critical point lies in the weak design of the initial diagnostic assessment (score 2.67) and periodic formative assessment (score 2.83) due to teachers' limited understanding in mapping students' initial cognitive and non-cognitive readiness independently. This obstacle is exacerbated by reliance on supporting teaching materials that are still conventional (score 2.83), so that an intensive mentoring program and the development of applicable technical guidelines are recommended. These improvement efforts should focus on strengthening teacher competency in designing comprehensive diagnostic assessment instruments, providing adaptive digital teaching materials, and writing procedures for selecting differentiated learning media.

The educator aspect shows that SMKN 2 Kendari has a very solid and proportional teacher capacity readiness (average accumulated score of 3.22/Good Category). The main strength in this aspect lies in the commitment to allocating very high project guidance time (score 3.83) and the teacher's expertise in designing IT-based learning media and concrete objects (score 3.50). This performance excellence is supported internally by the linear academic background of the six teachers who are relevant to the social science cluster, a balanced teaching load ratio to cover the entire Class X study group, and the employee status of all teachers who have been certified as State Civil Apparatus (ASN) so that the focus of teachers' work can be fully devoted to optimal student mentoring. On the other hand, this portrait of educator readiness still leaves challenges in the form of minimal frequency of teacher participation in formal government-organized Independent Curriculum training (the lowest score is 2.67). The limited availability of national and regional training programs forces teachers to engage in self-directed learning and rely on internal school Subject Teacher Consultation (MGMP) forums to address methodological challenges in the field. Therefore, school management is strongly recommended to facilitate teacher participation in official curriculum workshops and optimize MGMP collaboration to improve teacher competency, particularly in developing performance rubrics (score 3.17) and integrating social sciences more deeply and effectively for vocational students.

In this regard, 10th-grade students at SMKN 2 Kendari demonstrated strong digital and physical readiness to support 21st-century learning (average cumulative score of 3.02/Good category). Students' primary strengths lie in their ownership of independent learning resources, such as personal devices and internet access (highest score 3.38), as well as their physical health, which strongly supports field and laboratory practice (score 3.25). Psychosocially, students also exhibited a uniform level of interest in the project themes designed by their teachers (a score of 3.05). This combination of individual digital readiness and excellent physical health provides a highly advantageous foundation for teachers in implementing dynamic project-based learning both inside and outside the classroom. Despite this physical and digital potential, the evaluation uncovered challenges in the form of students' poor initial understanding of the syntax of the project-based learning system (the lowest score was 2.77) and their limited basic cognitive knowledge related to the science and science material (a score of 2.82). This situation was further complicated by sociological and spatial barriers, such as the existence of merged classes between engineering departments, which triggered indiscipline, and the layout of some classrooms, which were far from primary supervision, making them vulnerable to students' absenteeism. To minimize this reduction in effective learning time, the use of adaptive strategies such as peer tutoring and heterogeneous grouping proved effective in reducing students' psychological burden, strengthening group cohesion, and helping to translate project concepts more simply among peers.

In the component of facilities and infrastructure supporting the learning of the Science Project at SMKN 2 Kendari, it shows that the basic infrastructure supporting occupational safety and experimental logistics has been adequately fulfilled (accumulated average score of 2.89/Good Category). The main strength in this aspect lies in the waste disposal system for residual practices which is considered safe for the surrounding environment (the highest score is 3.03), the guarantee of the availability of good quality consumables for experiments (score 3.02), and the completeness of Occupational Safety and Health (K3) equipment in the laboratory (score 2.98). This data quantitatively proves that school management has a high commitment to meeting minimum operational standards for occupational safety and fulfilling basic project materials for students. The biggest structural challenges are indicated by the low adequacy of the number of trial/running test locations for products (the lowest score is 2.60) and the limited quantity of laboratory/IT equipment (score 2.78), which forces the use of the Science Laboratory in

rotation. This situation is exacerbated by the school's suboptimal Wi-Fi network (score 2.85), which creates blank spots in the classroom, and overly selective projector monitoring. Therefore, strategic interventions are recommended by school management to optimize the use of existing facilities. Improvement efforts can focus on creating a more flexible laboratory schedule, expanding Wi-Fi access points to minimize blank spots, and providing additional test sites to avoid long queues between groups.

B. Evaluation of the Learning Program at the Transactions Stage

The evaluation results at the transactions stage indicate that the Project learning process at SMKN 2 Kendari is generally in the good category. The components evaluated include learning methods, learning media, teacher-student interaction, student participation, and learning implementation.

Evaluation of the antecedent stage, specifically the Science Project Learning Method for Grade X at SMKN 2 Kendari, indicates that the implementation of the project-based learning model has been effective and adaptive (an average accumulated score of 2.97/Good Category). The main strengths of this component lie in the objective and transparent assessment of the final product by the teacher (the highest score was 3.13), the collaborative freedom for students to design projects independently (a score of 3.12), and the method's success in fostering a strong teamwork spirit (a score of 3.03). Furthermore, this evaluation identified critical points in the indicator for implementing reflection at the end of the project, which recorded the lowest score (2.72) and the accuracy of time allocation management per project phase (2.83). These obstacles were not caused by weak teacher pedagogical competence, but rather were the systemic impact of limited physical infrastructure in the field. The tight circulation of changing science laboratory spaces and multimedia equipment among the 13 study groups often caused the duration of the actual project work in the field to deviate from the schedule. As a result, teachers tended to run out of time at the end of the learning cycle and were forced to skip the reflection stage. Therefore, tactical interventions and more flexible rescheduling from school management were recommended. Operational solutions can be realized through the implementation of a periodic block system for the use of the Science Laboratory, optimizing the use of digital science simulation media in theory classrooms to overcome tool limitations, and expanding school internet access points.

The Learning Media component of the 10th Grade Science Project at SMKN 2 Kendari shows that the use of multimedia has successfully triggered learning motivation and facilitated students' understanding of concepts effectively (accumulated average score of 3.03/Good Category). The main strength in this aspect lies in the use of interactive digital media and the ability of media visualization to stimulate students' curiosity and creativity, which both achieved the highest score (3.10). In the context of vocational education, the superiority of this media is clearly proven in making it easier for students to design prototypes or final project products (score 3.08). The display of digital simulations is able to break down students' abstract thinking barriers so they can directly see mechanical and ecological visualizations of science projects that are adaptive and aligned with their interests (score 3.02), in line with the mandate of the Standard Process of Permendikbudristek Number 16 of 2022. However, behind the success of this visualization, this evaluation found a gap in operational deficits in the indicator of active student involvement in operating digital media or display tools which occupied the lowest score (2.88), along with ease of media accessibility (3.00). Field instructional patterns indicate that multimedia use remains teacher-centered, with students tending to be passive spectators and rarely given the opportunity to explore digital tools independently. Therefore, school intervention is recommended to address the limitations of these tools by expanding asynchronous, interactive digital media platforms accessible directly through students' personal devices, enabling students' active participation and technical independence to be fully realized.

The Teacher-Student Interaction aspect of the 10th-grade Science Project at SMKN 2 Kendari demonstrates that the socio-instructional dimension has been very harmonious and democratic (average cumulative score of 3.04/Good category). The main strengths of this component are indicated by two indicators that achieved the joint highest score of 3.18: the teacher's openness as a friendly/non-discriminatory facilitator and the creation of a safe, dynamic, and enjoyable learning atmosphere. Educators have successfully shed the impression of traditional rigidity by positioning themselves as trusted discussion partners who actively provide constructive feedback (score 3.10) and communicative feedback (score 3.13). Despite this conducive two-way communication climate, the evaluation identified crucial gaps in the indicator of teachers' intensity in stimulating stimulating questions that spark curiosity and creativity, which recorded the lowest score of 2.78. Furthermore, responsive assistance to technical challenges (score 2.95) and equal attention distribution to each group (score 2.97) are also areas that need improvement. Therefore, it is recommended that school management intervene in these structural constraints by adjusting teaching ratios more ideally or providing laboratory assistants/peer mentors, so that teachers have sufficient time and psychological energy to develop quality stimulating questions to optimally stimulate students' critical thinking. In the Student Participation component in the 10th Grade Science Project learning at SMKN 2 Kendari, it shows that the autonomy of group involvement learning (student agency) has been built effectively (accumulated average score of 3.02/Good Category). The main strength in this aspect lies in the dimension of horizontal relationships between students, which is shown by the high attitude of respecting differences in teammate opinions (the highest score is 3.23), as well as the commitment to punctual attendance and compliance with the responsibility of completing the portion of group assignments which both achieved a score of 3.18. This strong solidarity and social maturity are deeply rooted in the sociological character of students who are accustomed to a climate of working partnerships. However, behind the superiority of the horizontal relationship, the evaluation identified a contrasting anomaly in the dimension of vertical relationships (students to teachers), where the indicator of students' courage to ask critical or reflective questions to teachers occupies the lowest position (score 2.58/Good Category). Even though teachers are considered friendly, students still experience mental obstacles in the form of doubt, shame, and worry in the face of teacher authority, so they prefer to resolve conceptual confusion in private by discussing in peer groups or searching for data on the internet (score 2.92). This imbalance indicates that the essence of the Critical Reasoning dimension has not been optimally developed. Therefore, educators are advised to intervene by developing instructional methods that provide scaffolding and a question bank based on Higher Order Thinking Skills (HOTS) to encourage, stimulate, and cultivate students' critical thinking and reflective courage in the classroom.

The implementation of the 10th-grade Science Project Learning at SMKN 2 Kendari shows that the project's operational procedures within the student groups have been well-established (average accumulated score of 3.02/Good category). The main strength of this component lies in the effective implementation of systematic documentation of the project process from start to finish by students as digital natives (the highest score is 3.15), as well as the group's internal ability to mitigate conflict to maintain cohesiveness in line with the culture of mutual cooperation (score 3.05). However, the evaluation detected significant anomalies in the form of low compliance with Personal Protective Equipment (PPE) use in the laboratory, which recorded the lowest score (2.65), inaccurate execution of project stages according to schedule (2.87), and challenges in intergroup coordination in the classroom (2.73) due to limited PPE logistics and limited facility circulation. Substantially, the instructional process was not fully coherent, still dominated by conventional lecture methods and reliance on primary textbooks due to a lack of classroom multimedia devices. The scientific

approach was not deeply integrated, thus neglecting critical reasoning (associating) and data analysis of project results. Therefore, it is recommended that school management implement strategic policies to revitalize facilities, evenly distribute digital teaching aids, and provide a continuous professional development program for teachers of the Science Project.

C. Evaluation of the Science Project Learning Program at the Outcomes Stage

The evaluation results at the transactions stage indicate that the Project learning process at SMKN 2 Kendari was generally in the good category. The components evaluated included conceptual achievement, attitude changes, and practical skills. In the aspect of Conceptual Achievement (Cognitive) of the Science Project for Class X at SMKN 2 Kendari, it shows a portrait of quite good learning success collectively (average student perception score 3.09/Good Category). The results of subjective measurements place students' confidence in fulfilling the Learning Objective Achievement Criteria (KKTP) in the report card at the highest score (3.22), followed by understanding environmental sustainability issues (3.18). This alignment is confirmed by the average summative score of the school which reached 71.23, thus formally exceeding the minimum KKTP limit set (70). However, analysis based on the Countenance Stake model reveals a cognitive anomaly in the form of a very sharp disparity in achievement between classes of expertise programs, where 5 of the 13 parallel classes failed to reach the KKTP limit. Classes with abstract-spatial thinking characteristics such as X DPIB (85) and X KIJJ (84) achieved superior results. On the other hand, classes with pure kinesthetic-field characteristics such as X Mesin B (50), X TAB B (50), and X TITL B (53) experienced a decline due to saturation with the dominance of theoretical-conventional teaching methods presented during the implementation process (transactions). Although the team of teachers has attempted to minimize the inequality through strategies for providing directed outlines (scaffolding assessment) and optimizing individual oral tests, this inequality in cognitive results confirms that in the future school management and teachers must design learning differentiation that is able to accommodate the psychological characteristics and learning styles of each engineering expertise competency in the field.

In the aspect of Attitude Change (Affective), the Grade X Science Project at SMKN 2 Kendari showed positive and satisfactory results in general, with an average score of 3.11 on the student's independent perception questionnaire (Good Category). From the subjective assessment, the indicator of student concern and commitment to environmental preservation achieved the highest score of 3.28, followed by strengthening the attitude of mutual cooperation and tolerance of 3.23. This affective success is supported by the teacher's commitment to implementing continuous assessment using daily behavior observation sheets consistently throughout the semester. Qualitative data from these observations are integrated directly into the Pancasila Student Profile assessment to align with the school's eligibility target of 70 (Good/Developing According to Expectations) in order to produce vocational graduates who excel in terms of character and moral integrity (soft skills). This phenomenon of low affective engagement and declining daily performance was detected in pure engineering classes, such as Class X Mechanical B, Class X TAB B, and Class X TITL B. This occurred not due to deliberate categorization or separation of abilities by teachers, but rather due to a psychological clash between the learning style characteristics of engineering students, which tend toward dynamic physical-kinesthetic activities in the field, and the reality of classroom science project learning, which is still dominated by abstract social science theories. This condition triggers psychological resistance in the form of decreased focus and a loss of motivation for student participation in these engineering classes, necessitating adjustments to more contextual and applicable learning strategies going forward.

In the Practical Skills (Psychomotor) aspect, the Science Project for Class X at SMKN 2 Kendari demonstrated positive collective achievement,

with an average student self-perception score of 3.00 (Good Category). The main strengths in this domain were demonstrated by students' skills in presenting project results, defending group arguments, and answering examiner questions tactically (the highest score was 3.07). However, triangulation based on the Countenance Stake model detected operational gaps at the more technical process skill level. The indicators for systematic project investigation report preparation (2.97) and the ability to operate work tools or test instruments during product exhibitions (2.97) were the lowest coordinate points. The evaluation also showed a sharp polarization of skills: students in the DPIB, GEO, and KIJJ clusters were very mature in visual precision-based work, data analysis, and indoor engineering drawing; while students in the pure engineering cluster (Mechanical Engineering, TAB, TITL, and Welding) had high kinesthetic-mechanical field skills but quickly experienced burnout due to the dominance of theoretical-administrative assignments. Therefore, the team of teachers of the Science Project was recommended to immediately design an adaptive Teaching Module based on differentiated learning (differentiated product) to package science projects that were more practical, applicable, and linear with the characteristics of each department's workshop.

5. Conclusion

Evaluation of the antecedents stage shows that SMKN 2 Kendari is formally and legally well-prepared to embrace the Independent Curriculum. The School Operational Curriculum (KOS) document is well-structured, complete with a Learning Objective Achievement Criteria (KKTP) standard of 70 for the Science Project subject. In terms of teaching resources, the teachers possess relevant academic qualifications and are highly motivated to design transparent and adaptive assessment instruments, including the provision of assessment scaffolding and a structured oral test scheme. However, this readiness of theoretical input has not been evenly matched by the readiness of physical infrastructure on the ground. The school still faces limitations in classroom multimedia devices, a limited variety of digital teaching aids, and logistical limitations in Personal Protective Equipment (PPE) in the laboratory, which have directly limited students' room for experimentation since the program's inception. Transactions Stage (Learning Implementation Process) During the transactions stage, learning within student groups proceeded very conducively, particularly in terms of digital-based project documentation and the ability to mitigate conflict to maintain group cohesion. Teachers also consistently conditioned students' physical and psychological readiness through reviewing material at the beginning of lessons. However, the instructional process in the field encountered operational obstacles due to logistical and resource limitations identified in the antecedents stage. This resulted in low discipline in the use of PPE in the laboratory, inaccurate project execution according to schedule, and weak intergroup coordination in the classroom. Furthermore, the learning process was still dominated by conventional, one-way lecture methods and a heavy reliance on the 2022 edition of the Main Textbook without innovative modifications. As a result, the essence of the scientific approach, such as critical reasoning, data analysis, and reflection at the end of the lesson, was neglected due to limited teaching time and the lack of practical technical guidance regarding the Independent Curriculum for teachers. Outcomes Stage (Student Learning Achievements) In the outcomes stage, this program successfully recorded an average school cognitive score of 71.23 (above the KKTP standard of 70) and an average change in positive student attitudes of 3.11 (Good Category). This final score was successfully saved by a vocationally oriented report card weighting system in accordance with Permendikbudristek Number 21 of 2022, which combines 60% daily performance formative assessment and 40% summative assessment. However, in-depth analysis revealed a very sharp disparity in achievement between expertise programs. Groups of students with analytical-visual learning styles in the classroom (such as DPIB, GEO, and KIJJ) were able to achieve superior results. In contrast, pure engineering students who are

kinesthetic-field oriented (such as Mesin B, TAB B, and TITL B) experienced decreased motivation, academic fatigue (burnout), and failed to achieve KKTP due to being bored with the dominance of theoretical-administrative methods during the implementation process (transactions). This is a strong recommendation for the IPAS Project teacher team to develop adaptive teaching modules based on differentiated learning (differentiated products) that are more practical, applicable, and have a workshop feel to align with the characteristics of each engineering expertise program.

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