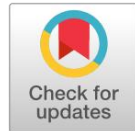


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A Narrative Review of Entrepreneurship Education Assessment in Vocational High Schools in Pekanbaru

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ABSTRACT

Background. Entrepreneurship learning demands students' ability to design, manage, and evaluate real business activities, requiring assessment systems capable of measuring entrepreneurial competence comprehensively and authentically.

Purpose. This study analyzes the form, type, and instruments used in entrepreneurship assessment at Pekanbaru Vocational Schools, evaluates how holistically assessments reflect entrepreneurial competence, and examines the validity and reliability of instruments used.

Method. A mixed-methods sequential explanatory design was employed across four vocational schools (SMK Negeri A–D, Pekanbaru). Data were collected via teacher questionnaires, documentation studies of learning tools, assessment results, and semi-structured interviews. Content validity was tested using Aiken's V through expert judgment; criterion validity using Pearson Product Moment correlation both conducted only at two state schools, as private schools lacked independently compiled instrument documents. Reliability testing via Split-Half (Spearman-Brown) could not be implemented at any school due to unavailability of raw item-level score data, itself a substantive finding on assessment governance.

Results. A significant decoupling emerged between high teacher questionnaire scores (84%–96%) and limited documentary evidence availability (0%). Content validity was satisfactory (Aiken's V = 0.71–0.98). Criterion validity was confirmed only at SMKN A ($r = 0.843$; $p = 0.000$), while SMKN B was invalid ($r = 0.010$; $p = 0.956$) due to content misalignment.

Conclusion. Entrepreneurship assessment practices at Pekanbaru vocational schools remain suboptimal. State schools face technical-pedagogical barriers; private schools face additional structural-managerial constraints preventing independent instrument documentation. Strengthening assessment data governance and instrument alignment is urgently needed.

KEYWORDS

Assessment Practice, Entrepreneurship Education, Vocational High School

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INTRODUCTION

Vocational High School (SMK) is a secondary education level designed to produce job-ready graduates through practice-based learning, competency training,



and internship programs in the industrial world. However, the reality on the ground shows that the unemployment rate is still high. This leads to problems at the assessment level. Sumarno et al. (2023) found that the assessment of entrepreneurship subjects in several new schools was in the “quite good” category, with average scores ranging from 2.89 to 3.29 (Sumarno et al., 2023). This means that the assessment system is not fully optimal in assessing students’ entrepreneurial potential. Assessment is an important component in education because it functions to assess the success of the learning process. According to Cristiana et al. (2023), the quality of assessment determines the overall effectiveness of learning. In the context of the 21st century, an authentic assessment approach is a major demand (Cristiana et al., 2023). Authentic assessment emphasizes the measurement of learning processes and outcomes with instruments that are in accordance with students’ real competencies (Arta, 2024).

Entrepreneurship has a very important role in economic and social development. According to Andayani (2020), entrepreneurship contributes to reducing unemployment, increasing income, and creating business diversity (Andayani, 2020). Its relevance to vocational education is very clear, because one of the main goals of vocational schools is to prepare students not only to work in the industry, but also to open businesses independently. However, facts in the field show that the majority of vocational school graduates are still oriented towards becoming workers (Sumarno, 2021).

This happens because the practice of entrepreneurship assessment in vocational schools is still dominated by cognitive and administrative aspects. Assessment tends to be limited to mastery of theory, while affective and psychomotor dimensions such as entrepreneurial attitude, practical skills, creativity, and innovation are poorly accommodated (Suarda et al., 2015). As a result, students are considered academically smart but not necessarily ready to face the dynamics of the business world. (Suarda et al., 2015) emphasized that entrepreneurship assessment in vocational schools is still not oriented to industrial needs. The lack of collaboration with entrepreneurs or business mentors further worsens the situation. In fact, the involvement of external parties can provide real experience for students to understand the world of work and business more deeply (Martini et al., 2023).

The profile of vocational school graduates is measured through the cognitive, affective, and psychomotor domains to be able to face the challenges of the large number of vocational school graduates who find it difficult to get a job, so the government has developed an entrepreneurship education curriculum in vocational schools as a strategy to increase the competitiveness of graduates while encouraging the growth of the entrepreneurial ratio in Indonesia (Sagita et al., 2025). This profile is expected to be able to map students’ skills in entrepreneurship as the basis for solving the problem of high unemployment (Novedliani, 2024). In this context, assessments are not only a tool to measure academic achievement, but also an important instrument to ensure students’ readiness to be entrepreneurial (Rahma et al., 2025). Entrepreneurship assessments should be combined with quantitative assessments to be able to measure practical skills and professional attitudes, not just the results of written tests (Kustitik & Hadi, 2016b). Therefore, learning strategies in vocational schools need to be combined with authentic assessments that really assess students’ ability to design, manage, and evaluate a business.

This study aims to: (1) analyze the form, type, and assessment instruments used in entrepreneurship education at Pekanbaru Vocational Schools; (2) assess the extent to which assessments in vocational schools reflect entrepreneurial competence holistically; and (3) evaluate the validity and reliability of the instruments used, including the evaluation of the form, type, and instrument of assessment. The results of the research are expected to make a theoretical and practical contribution to teachers to be able to improve assessment strategies. With the implementation of

authentic and comprehensive assessments, vocational school graduates are expected to be not only ready to work but also able to create jobs.

RESEARCH METHODOLOGY

This study uses a mixed methods approach that combines quantitative and qualitative methods with sequential explanatory designs (Abu & Toyon, 2021). The choice of this approach is motivated by the complexity of the analysis of entrepreneurship education assessments which not only requires an objective measurement of the quality of the instrument, but also a deep understanding of the practice of its implementation in the field. The quantitative approach is used to measure the validity and reliability of assessment instruments statistically, identify patterns and trends in the use of different types of assessments, generate generalizable data on similar populations, and test the consistency of measurement results through inferential statistical analysis. Meanwhile, a qualitative approach is used to understand the meaning and context behind assessment practice, explain the implementation process in depth, reveal teachers' perceptions, challenges, and experiences in carrying out assessments, and provide an understanding of the phenomenon of entrepreneurial assessment. Through this combination, research can produce comprehensive findings, where qualitative data plays a role in explaining and enriching the findings obtained from quantitative data (Sugiyono, 2020).

This research was carried out in the city of Pekanbaru as many as 4 (four) vocational schools consisting of 2 State Vocational Schools and 2 Private Vocational Schools. The selection of the four schools was based on their relevance to the research focus, namely the implementation of assessments in entrepreneurship education in the vocational school environment. The sample in this study was determined using purposive sampling techniques, which were focused on teachers teaching entrepreneurship subjects in the four schools. The main criteria set for respondents were teachers who had at least two years of entrepreneurial teaching experience. This aims to ensure that the data obtained regarding assessment instruments is credible and in-depth, considering that teachers with this experience are assumed to have comprehensively understood the dynamics of learning outcome evaluation. As part of the data reinforcement, this study also involved grade XI students as supporting respondents to obtain a triangulation picture of sources related to the implementation of assessments in the classroom. For the purpose of the criterion validity test, student score data were collected from two state vocational schools, with a total of 38 grade XI students from SMKN A Pekanbaru and 36 grade XI students from SMKN B Pekanbaru. These students were selected using purposive sampling based on the completeness of practice and examination score documentation available from the entrepreneurship teachers at each school.

The quantitative data in this study is sourced from primary data collected directly in the field. The main source of quantitative data is a closed ended questionnaire distributed to respondents to collect information on the use of different types of entrepreneurship assessments. Meanwhile, qualitative data is collected to provide depth and context to the quantitative findings. Some data collection instruments are specifically designed to answer research questions both quantitatively and qualitatively. For quantitative data, the main instrument used is a questionnaire. This questionnaire contains a Likert Scale of 1-5 which is designed to measure teachers' perceptions of the quality of entrepreneurial assessments, providing numerical data that is ready to be analyzed statistically. In addition, the questionnaire is also equipped with a checklist to identify the types of assessments used about the use of assessment techniques, so as to reveal objective patterns and trends.

The qualitative instruments used to explore in-depth and contextual information are as follows; 1) In depth interview guidelines are prepared with open-ended questions to explore the real practice

of entrepreneurship assessment in the field. 2) Observation sheets are used to collect data directly, which contains a checklist of the assessment process, space for detailed field notes on teacher-student interactions during the assessment, and 3) documentation of how the rubrics and assessment instruments are applied in real-world situations.

Quantitative data analysis is carried out through several comprehensive statistical stages such as calculating average values, percentage calculations, validity tests and reliability tests. Meanwhile, qualitative data was tested using data triangulation.

RESULT AND DISCUSSION

Types and Forms of Entrepreneurship Education Assessment

Based on the data collection carried out through the distribution of questionnaires to teachers, documentation of learning tools (teaching modules/RPP), and analysis of assessment files, a comprehensive mapping of the implementation of assessment in entrepreneurship subjects at SMK Pekanbaru was obtained, the data of which is presented in Table 4.1 below:

Table 1. Types and Forms of Entrepreneurship Education Assessment

Types of Assessments	Form of Assessment	Things That Are Assessed	Percentage of Questionnaires (%)	Percentage of Documents (Devices)	Percentage of Assessment Results
Diagnostic	Written Test (Essay & Objective)	Kognitif (C1C3)	96%	0%	0%
	Observations	Noncognitive (motivation, readiness)	84%	0%	0%
	Interview/Questionnaire	Interests & Attitudes	92%	0%	1%
Formative	Objective Tests	Kognitif (C2C4)	92%	2%	0%
	Essays	Kognitif (C3C5)	92%	2%	0%
	Oral Tests	Communication & Understanding	96%	0%	0%
	Class Discussion	Collaboration & Critical Thinking	96%	1%	0%
	Product Presentation	Creativity & Communication	88%	2%	0%
Summative	Written Test	Concept Mastery	84%	4%	4%
	Portfolio	Holistic Competencies & Entrepreneurial Attitude	88%	2%	0%

Work Demonstrations	Performance Test (Tes Perbuatan)	92%	2%	0%
Projects	Whole Entrepreneurial Competence	92%	0%	0%

Table 1 provides a comprehensive empirical overview of the distribution of types and forms of assessment based on the results of teacher questionnaires, the availability of device documents, and real evidence of archived assessment results. Judging from the data of statements through teacher questionnaires, each form of assessment consistently shows a percentage that is in the very high category, with scores ranging from 84% to 96%. The highest scores in the questionnaire results were found in diagnostic assessments in the form of written tests (essays & objectives), as well as formative assessments in the form of oral tests and class discussions, all of which recorded a score of 96%. Meanwhile, the lowest percentage value of the questionnaire was found in the summative assessment in the form of a written test of concept mastery, which was 84%.

The percentage distribution shows that conceptually, all forms of assessment, both those that measure cognitive and non-cognitive aspects, have been understood by teachers in entrepreneurship learning. However, if these findings are associated with data on the frequency of device documents and the availability of evidence from physical assessment results, it is found that there is a very unequal variation and *a real disharmony (decoupling)*. This variation of data suggests a potential gap between teachers' perceptions of assessment practice and the archival evidence available in schools. It should be noted, however, that the questionnaire data measures teachers' perceptions while the document data measures archival availability two constructs that are not identical. The observed gap may partly reflect documentation and archiving challenges rather than an absolute absence of assessment practice. Nonetheless, taken together, these findings indicate that the implementation of entrepreneurship assessment in the field has not followed an ideal pattern and appears to still be undergoing structural simplification centered on conventional paper based approaches. To dissect the complexity of these findings, an in-depth analysis was carried out through the division of subchapters that focused on two main dimensions, namely the form of assessment and the type (stage) of assessment in entrepreneurship education.

The form of entrepreneurship education assessment at SMK Pekanbaru theoretically shows the use of two main approaches, namely test-based assessment and non-test (authentic) assessment. The focus of the discussion in this section focuses on how the form of assessment is used in measuring students' competence, both from cognitive, affective, and psychomotor aspects, as well as analyzing the contradiction between teachers' perceptions and the reality of documents in the field. The form of test-based assessment in the field is dominated by a written test consisting of multiple choice (objective) and essay. The objective test was used to measure the mastery of concepts in a structured manner at the cognitive level C2–C4 (with a percentage of questionnaire of 92% and the availability of 2 device documents), while the essay test was used to explore students' analytical and evaluation skills at the cognitive level C3–C5 (92% of questionnaires, 2 device documents). The main characteristics of this form of test-based assessment are efficiency in measurement, ease of standardization, and quantitative assessment objectivity.

Non-test forms of assessment include observation, interviews, class discussions, and product presentations. Ideally, observation and interviews are used to assess noncognitive aspects such as readiness, motivation, and entrepreneurial interest and attitude. Class discussions (96% of questionnaires) and product presentations (88% of questionnaires) function to develop and filter

students' communication, collaboration, and creativity skills in the context of business simulations. Meanwhile, authentic forms of assessment are seen through the use of portfolio instruments (88% questionnaires), work demonstrations (92% questionnaires), and projects (92% questionnaires) designed to assess students' practice competencies and entrepreneurial characteristics as a whole.

The type of entrepreneurship education assessment at SMK Pekanbaru includes three main stages that form a continuous assessment flow, namely diagnostic assessment, formative assessment, and summative assessment. These three types of assessments ideally guide the student learning cycle, starting from initial capacity identification, monitoring and providing feedback during the process, to measuring final achievements.

Diagnostic assessments are used in the pre-learning stage to map students' readiness, motivation, and initial competencies as the basis for designing instructional differentiation strategies. The data in Table 4.1 shows a very high percentage of questionnaire responses for this type, where the initial cognitive aspect is 96%, the non-cognitive aspect (motivation/readiness) is 84%, and the attitude interest is 92%. This value indicates normatively that teachers understand the importance of recognizing student characteristics.

However, the implementation of this type of assessment has not been running optimally. This can be seen from the frequency of assessment device documents that show a number of 0%, as well as the assessment result documents which are mostly also at 0% (unless there is 1 document from the interview/questionnaire). This difference shows that the process of early identification of students at Pekanbaru Vocational School has not been systematically and scientifically documented. As a result, entrepreneurship learning is still carried out without the support of accurate diagnostic data. This condition causes learning to tend to use the same approach for all students, so that they do not pay attention to the differences in learning styles and entrepreneurial interests that each student has. In fact, each student has different learning readiness, interests, and learning profiles, so it requires a learning strategy that is tailored to their individual characteristics (Tomlinson, 2017). In the context of entrepreneurship education, learning that does not consider the diversity of students' characteristics has the potential to hinder the development of creativity, initiative, and decision-making skills that are the main competencies of an entrepreneur (Neck et al., 2021). The results of the study show that the application of differentiated learning is able to increase student learning engagement, motivation, and learning outcomes because it provides opportunities for students to learn according to their needs and interests (Bondie et al., 2019; Suprayogi et al., 2017). In addition, recent research has also found that an approach centered on students' interests and characteristics contributes positively to the development of students' entrepreneurial competencies and innovative attitudes (Lackéus, 2020).

Formative assessments are carried out continuously during the learning process with the main purpose as *an assessment for learning*, which is to monitor student learning progress and provide feedback for students and teachers. Data shows that this type of assessment obtains high questionnaire results, which range from 88% to 96%. Interactive forms of assessment, such as oral tests (96%) and class discussions (96%), are also recognized to be often used by teachers to create a more active learning atmosphere. However, the main disadvantage of formative assessment lies in the lack of standardization of assessment instruments. This can be seen from the very limited supporting documents, such as observation sheets and assessment rubrics, which only 1 document is available for class discussion and 2 documents for product presentation. In addition, the assessment results documents that are actually used in practice are also still at 0%. This condition shows that the formative assessments carried out are still intuitive and have not been systematically documented and are only a complement to learning activities in the classroom and do not have any evidence of accountability for administration. This has an impact on the weak function of assessment itself as a

tool to monitor student learning development, because without structured documentation, teachers do not have objective data that can be used as a basis for valid and sustainable pedagogical decision-making (Black & Wiliam, 1998).

This condition causes learning to tend to use a uniform approach for all students, so that it is less able to accommodate the differences in characteristics, interests, and entrepreneurial potential that students have. In fact, the diversity of students' learning needs is an important factor that needs to be considered in designing a meaningful learning experience (Santangelo & Tomlinson, 2012). In entrepreneurship education, learning that provides space for students to explore interests, creativity, and real problem-solving will be more effective in shaping entrepreneurial competencies than conventional and teacher-centered approaches (Fayolle & Gailly, 2015). Gibb's (2002) research shows that effective entrepreneurship education must be able to develop creative thinking skills, decision-making, and courage to face uncertainty. In addition, Jones and Iredale (2010) found that learning experiences tailored to students' needs and contexts contribute to increased motivation and entrepreneurial readiness. Therefore, entrepreneurial learning needs to be designed flexibly and oriented to the needs of students so that learning goals can be achieved optimally.

Summative assessments are carried out at the end of learning to measure the level of achievement of students' competencies as a whole (*assessment of learning*). As an important part of determining learning outcomes and academic accountability, this type of assessment obtained a high questionnaire score, ranging from 84% to 92%. In contrast to diagnostic and formative assessments which have limited physical evidence, summative assessments actually have more complete documentation in schools. This documentation is mainly seen in the use of written tests supported by 4 device documents and 4 assessment result files. In general, the high scores on all types of assessments in the questionnaire data show that teachers have carried out the learning evaluation stages continuously from the beginning to the end of the learning process. However, when compared with the results of the analysis of the form of assessment used, there is a discrepancy in its implementation. Such conditions ultimately have an impact on the validity of the learning evaluation data produced, because instructional decisions made by teachers based on inaccurate perceptions have the potential to produce learning interventions that are not on target and unresponsive to the actual learning needs of students (Brookhart, 2011).

The summative assessment that should be used to measure entrepreneurial competence as a whole is still focused on mastering concepts through written tests so that they are less able to foster creative thinking skills, the ability to identify business opportunities, and students' confidence in making decisions related to entrepreneurial activities. In fact, entrepreneurship education not only aims to transfer knowledge, but also forms an entrepreneurial mindset characterized by creativity, innovation, adaptability, and courage to face challenges (Kuratko et al., 2021). Research by Hoang et al. (2023) shows that an active, student-centered learning experience contributes significantly to improving entrepreneurial competence and entrepreneurial readiness. Similar findings were put forward by Bell and Bell (2020) who stated that a learning environment that provides opportunities for exploration, collaboration, and real problem-solving is able to increase student engagement while developing innovative skills needed in the business world. Meanwhile, more authentic forms of assessment such as real projects have not been carried out optimally, because no device documents or physical assessment results (0%) have been found. This condition shows that the implementation of summative assessments is still not fully able to measure students' practical skills and entrepreneurial abilities in real terms.

The absence of physical evidence from the assessment results on entrepreneurship project instruments, portfolios, and demonstrations provides a strong picture of the fundamental problems in

vocational education. This condition is related to the still high Open Unemployment Rate (TPT) of vocational school graduates in Riau, especially in the city of Pekanbaru, which reached 9.01% according to BPS data in 2024. When schools have not implemented authentic assessments, such as preparing business proposals, pitching, simulating financial statements, and real work practices based on on-the-job training, the abilities of students assessed by the school do not fully reflect the competencies needed in the world of work and the business world. As a result, the assessment results obtained by students tend to be theoretical and have less relevance to real employment needs (Pittaway & Edwards, 2012; Bacigalupo et al., 2016).

This problem also shows that teachers still face obstacles in implementing authentic assessments, even though they have a positive perception of the use of the assessment on the questionnaire. One of the main causes is the limited competence in compiling performance-based assessment instruments. Compared to conventional written tests, authentic assessments require more complex capabilities, such as compiling assessment rubrics, determining performance indicators, and ensuring that instruments have good validity and reliability. This limitation is the cause of the inhibition of the implementation of comprehensive authentic assessments in educational units, which ultimately weakens efforts to improve the quality of learning oriented to the development of students' higher order thinking skills as mandated in the Independent Curriculum policy (Kemendikbudristek, 2022).

In addition, the high burden of teaching administration makes some teachers prefer to use objective written tests and essays because they are easier to prepare, correct, and are considered more practical. The written test is also considered safer in terms of assessment objectivity. If problems related to teachers' technical abilities in compiling and managing authentic assessments are not immediately overcome through systematic and continuous training, then efforts to develop entrepreneurship education assessments at Pekanbaru Vocational Schools will be difficult to develop optimally. As a result, the assessment system will continue to be dominated by conventional approaches that are less able to measure students' real skills and have the potential to weaken the relevance of vocational school graduates to the needs of the world of work in the future (Morris, M. H., Webb, J. W., Fu, J., & Singhal, S, 2013).

This condition strengthens the findings from Sumarno et al. (2023) who stated that the quality of entrepreneurship assessments in schools is still in the "quite good" category and is not optimal. The dominance of assessment on low-level cognitive aspects causes entrepreneurship education to focus more on the delivery of theoretical knowledge, compared to character building, entrepreneurial attitudes, and life *skills*. As a result, students understand more concepts in theory, but are not fully able to apply practical skills and entrepreneurial values in real life. This condition can cause vocational school graduates to experience difficulties when entering the workforce, because their practical abilities have not been optimally tested through valid and accountable assessment instruments in schools (Hägg, G., & Gabrielsson, J, 2020).

Validity of Entrepreneurship Assessment Instruments

The quality testing of the assessment instrument is carried out through two approaches, namely the validity test of the content (*content validity*) using Aiken's V coefficient through expert judgment (*expert judgment*), as well as the criterion validity test (*criterion validity*) using correlation *Pearson Product Moment*. The comparative validity test of content can only be carried out on instruments owned by SMKN A Pekanbaru and SMKN B Pekanbaru, considering that the two private schools do not compile assessment instrument documents independently due to time constraints and heavy teaching administrative burden. This is in line with the findings (Kustitik & Hadi, 2016) that the

development of authentic assessment tools in vocational schools is often constrained by institutional factors and the technical capacity of teachers.

Table 2. Comparative recapitulation of the results of the content validity test (Aiken's V)

Yes	Types of Assessment Instruments	Assessment Tool			
		Average Grade V (SMKN A)	Eligibility Category (SMKN A)	Average Grade V (SMKN B)	Eligibility Category (SMKN B)
1	Asesmen Diagnostik Cognitive	0,72	Medium	0,71	Medium
2	Non-Cognitive Diagnostic Assessment	0,78	Medium	0,78	Medium
3	Asesmen Formative	0,81	High	0,83	High
4	Formative Non-Test Assessment (Observation & Performance Test)	0,9	High	0,85	High
5	Summative Assessment	0,83	High	0,86	High
6	Students' Self-Reflection Sheet on the Products Made	0,93	High	0,86	High
7	Student Portfolio Sheet	0,93	High	0,93	High
8	Student Entrepreneurial Attitude Assessment Sheet / Attitude Scale	0,95	High	0,95	High
9	Project Assessment Instrument Sheet	0,98	High	Unused	-
10	Project Presentation Appraisal Sheet	0,98	High	Unused	-
11	Observation Assessment Instrument Sheet	0,94	High	Unused	-
12	Performance (Unjuk Kerja) Instrument Sheet	0,96	High	Unused	-

The results of the content validity test using the Aiken's V formula showed that all components of the assessment instrument were in the range of 0.71–0.98 values. The cognitive diagnostic assessment instrument obtained a score of 0.72 while the non-cognitive diagnostics recorded an identical score of 0.78 in both schools, both of which were in the medium category. These values confirm that the question items on the diagnostic instrument are adequate in mapping the initial readiness and psychological profile of students before learning begins (Lackéus, M, 2015). Periodic and end of learning assessment instruments showed stronger quality, namely formative assessments (tests) in the range of 0.81–0.83 and formative non-test assessments (observation & performance test) at 0.85–0.90, summative assessments at 0.83–0.86, and performance-based authentic instruments such as self-reflection sheets (0.86–0.93), student portfolios (0.93), and entrepreneurial attitude scales (0.95) which were fully in the high category. The highest score was found in the project assessment instrument and project presentation assessment of SMKN A Pekanbaru, which was 0.98 each, which

reflected a very strong substantive relevance to the competency indicators of the Independent Curriculum.

The criterion validity test was carried out by correlating student practice scores (variable X) and student exam scores (variable Y) using the *Pearson Product Moment* technique, with the type of *concurrent validity*. The results of the criterion validity test are presented in Table 3 below.

Table 3. Results of the Criterion Validity Test

Yes	School	Correlated Variables	r count	Sig. (2-tailed)	N	Verdict
1	SMKN A Pekanbaru	Practice Score (X) Test Score (Y)	0,843	0,000	38	Valid
2	SMKN B Pekanbaru	Practice Score (X) Test Score (Y)	0,01	0,956	36	Invalid

The test results at SMKN A Pekanbaru showed a Pearson correlation coefficient of $r = 0.843$ with a significance of 0.000 ($n = 38$ students), so it was declared valid. This very strong correlation proves that students' daily practice scores are consistently aligned with final exam achievements, so that the instruments used by teachers are able to accurately represent students' abilities (Nabi, G., Walmsley, A., Liñán, F., Akhtar, I., & Neame, C, 2018). On the other hand, SMKN B Pekanbaru obtained a correlation coefficient of $r = 0.010$ with a significance of 0.956 ($n = 36$ students), so it was declared invalid. Through qualitative data triangulation, this invalidity is explained by methodological technical factors, namely the absence of complete documentation of question items per indicator and the lack of synchronization between the practice question material and the summative exam material that comes from different learning periods. This condition emphasizes that the quality of assessment documentation and the consistency of teachers in providing scores are the main pillars of the validity of assessment instrument criteria in the field (Vahlia & Sholiha, 2023).

Reliability of Entrepreneurship Assessment Instruments

Based on the design of the research methodology, the reliability analysis of the instrument was initially planned using a quantitative approach through the *Split Half* (Two) to measure the level of internal consistency of the items of the assessment tools in the sample school. However, the implementation of data collection in the field revealed fundamental administrative and technical constraints, where print and digital archives containing raw student answer scores per question item were not found, both in curriculum matters and in teachers of related Creative Products and Entrepreneurship (PKK) subjects. This constraint on the availability of empirical data causes statistical reliability tests using the reliability coefficient formula to not be implemented comparatively across sample schools. This objective condition reflects that the governance of documentation of evaluation results in the field has not been properly standardized, so that the proof of the internal consistency of the measuring instruments numerically experiences methodological obstacles.

Although there are limitations in quantitative reliability testing due to the undocumented raw scores of students, a comprehensive portrait of the reliability of assessment implementation can be understood integratively through qualitative findings. Teachers utilize various assessment approaches such as pretests, observations, project assessments, presentation of business ideas (*pitching*), to real business practices. Thus, assessments in entrepreneurial learning not only function as a tool for

evaluating learning outcomes, but also as a supporting means to develop students' entrepreneurial competencies comprehensively and sustainably.

The inability to present the reliability coefficient empirically in this study is not merely a technical failure, but is a meaningful qualitative finding regarding the real conditions of assessment administration governance in the field. The phenomenon of undocumented raw student scores per question at the education unit level reflects systemic weaknesses in the assessment data archiving and management system at Pekanbaru City Vocational Schools. From the perspective of continuous assessment theory, the availability of raw score data is not only a technical prerequisite for reliability testing, but also a reflection of the maturity of the evaluation culture possessed by educational institutions. (Ramli et al., 2025) emphasized that the step of data collection through documentation of exam questions and student answer sheets is a fundamental prerequisite for the implementation of a valid empirical reliability analysis in educational evaluation research.

The inability to implement this reliability test also has direct implications for the quality assurance of assessment instruments in the field. The theory of continuous assessment emphasizes that the creation of valid and reliable instruments requires basic educational statistical skills and a deep understanding of instrument testing techniques that are often not fully mastered by teachers in the field of productive study at the vocational level. This pedagogic competency barrier is strengthened by the findings (Fernanda et al., 2025) in a study of teachers' readiness analysis to implement authentic assessments in the Independent Learning Curriculum, which found that the implementation of assessments in vocational schools is often constrained by the lack of teachers' mastery of the techniques of preparing authentic instruments, the absence of operational guidelines for making standard rubrics, and the scarcity of intensive mentoring programs from the education office related to testing procedures reliability of evaluation instruments at the level of educational units.

This condition is further confirmed by the findings of mixed method triangulation in this study, where although the data of the teacher's perception questionnaire shows a good conceptual understanding of the importance of the validity and reliability of the instrument, the facts in the field show that the technical implementation capacity has not been optimal. This gap between normative knowledge and implementation practice is an issue consistent with studies (Budiantoro et al., 2021) which emphasizes that before being used in research or continuous assessment, student competency measurement instruments should have gone through a standardized validity and reliability test process as a condition for the feasibility of measuring tools. The absence of such procedures in the practice of entrepreneurship assessment at Pekanbaru Vocational Schools indicates that the minimum standards of quality assurance of instruments have not been fully internalized in the professional culture of teachers in the field.

CONCLUSION

Based on the findings of the research, entrepreneurship education assessment at SMK Kota Pekanbaru conceptually encompasses three main categories diagnostic, formative, and summative assessment implemented through diverse instruments including written tests, observation, performance tests, projects, and portfolios. Teachers' perceived implementation rates were very high (84%–96%); however, a substantial gap exists with actual documentary evidence (0%–4%), indicating that conceptual understanding has not yet been transformed into systematic, accountable assessment practice. The cognitive domain dominates documented instruments (C2–C5), while the affective domain is only standardized at state schools through the Entrepreneurial Attitude Scale (Aiken's $V = 0.95$), and the psychomotor domain has no physical assessment result documents (0%)

except at SMKN A Pekanbaru which has unjuk kerja ($V = 0.96$) and project assessment ($V = 0.98$) instruments. Regarding instrument quality, content validity of all instruments at SMKN A and SMKN B Pekanbaru was satisfactory (Aiken's $V = 0.71$ – 0.98). Criterion validity showed contrasting results: SMKN A Pekanbaru was valid ($r = 0.843$; $p = 0.000$), while SMKN B Pekanbaru was invalid ($r = 0.010$; $p = 0.956$) due to content misalignment between formative and summative items and unstandardized scoring. Reliability testing using the Split Half (Spearman Brown) method could not be implemented at any school because raw item-level score data were not archived, which itself constitutes a substantive finding regarding weaknesses in assessment data governance. Private schools face additional structural managerial barriers particularly heavy administrative burdens that prevent the independent development and documentation of assessment instruments, while all schools share technical pedagogical constraints including limited instructional time, large class sizes, and difficulty in objectively assessing entrepreneurial attitudes without standardized instruments.

Based on these findings, several practical recommendations are proposed. First, for state schools: standardize the alignment of formative and summative item content, develop a digitalized archiving system for raw student score data per item (e.g., via Google Forms/Sheets) to enable future reliability testing, and systematically schedule DUDI involvement in project assessment as part of the academic calendar. Second, for private schools: the Pekanbaru City Education Office should provide validated, ready-to-use assessment instrument templates to reduce the burden of independent instrument development; coaching-based assistance for entrepreneurship teachers on authentic rubric construction, instrument validation procedures, and assessment data archiving should be provided; and administrative simplification of non-instructional tasks should be prioritized to give teachers sufficient capacity to design and document assessment instruments. Third, at the policy level, the Independent Curriculum framework should be accompanied by operational technical guidelines specifically addressing authentic assessment procedures in entrepreneurship subjects, with built-in supervision mechanisms. Fourth, future research should investigate the relationship between assessment quality and graduate entrepreneurial readiness, and develop valid, reliable, and implementable authentic assessment models based on real student business activities applicable across both state and private vocational schools.

DECLARATION OF AI AND AI ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

During the preparation of this work the author(s) used Gemini AI in order to Improve sentence structure. After using this tool/service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.

AUTHORS' CONTRIBUTION

Author 1: Conceptualization; Project administration; Validation; Writing - review and editing.

Author 2: Conceptualization; Data curation; Investigation.

Author 3: Data curation; Investigation.

DECLARATION OF COMPETING INTEREST

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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