

Practical Skills Readiness and Entrepreneurial Learning Engagement among Grade 6 TLE Learners

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ABSTRACT

This study investigated the relationship between practical skills readiness and entrepreneurial learning engagement among Grade 6 Technology and Livelihood Education learners at Old San Mariano Integrated School in San Mariano, Isabela. A cross-sectional explanatory association design was employed, and participants were selected through systematic random sampling. Data were gathered using a validated researcher-developed questionnaire measuring procedural understanding, tool and material preparation, safe task performance, work organization, problem-solving, independent task completion, teamwork, initiative, resourcefulness, persistence, and participation in value-creating activities. Medians and interquartile ranges described the variables, while Kendall's tau-b and

Theil-Sen robust regression tested their association. Results showed that the learners were generally ready for practical TLE tasks and were often engaged in entrepreneurial learning activities. They performed more strongly in safety, procedural understanding, teamwork, and attention, but demonstrated weaker readiness in independent task completion and lower engagement in initiative and resourcefulness. Practical skills readiness had a significant moderate positive association with entrepreneurial learning engagement, with independent task completion and problem-solving showing the strongest links to engagement. The robust regression result further indicated that higher practical readiness corresponded with stronger entrepreneurial participation. The findings suggest that TLE instruction should provide progressive performance tasks that move from guided practice toward independent work, decision-making, material substitution, product development, and problem-solving. Strengthening practical competence may help learners become more active, responsible, persistent, and resourceful in entrepreneurial learning.

Keywords: *entrepreneurial learning engagement, Grade 6 learners, practical skills readiness, Technology and Livelihood Education, Theil-Sen regression, TLE instruction*

INTRODUCTION

Education becomes more meaningful when learners can use what they know to complete tasks, solve familiar problems, and create something useful. This principle is especially important in Technology and Livelihood Education, where knowledge is expected to lead to purposeful action. Practical activities allow learners to handle materials, follow procedures, make decisions, manage available resources, and judge the quality of their work. Entrepreneurial learning extends these abilities by teaching learners to recognize opportunities, develop ideas, organize resources, and act responsibly. The Entrepreneurship Competence Framework presents entrepreneurship as a competence that may be developed from primary education onward. It groups entrepreneurial competence into three connected areas: ideas and opportunities, resources, and action. These areas

show that entrepreneurial learning is not limited to starting a business. It also involves creativity, initiative, planning, cooperation, responsible decision-making, and the ability to turn ideas into value for other people (Bacigalupo et al., 2016).

In Philippine basic education, Technology and Livelihood Education provides learners with opportunities to apply knowledge through activities that resemble tasks performed at home, in school, and in the community. The Grade 6 learning material for TLE includes Information and Communications Technology and Entrepreneurship, Agriculture, Home Economics, and Industrial Arts. Its competencies require learners to perform activities such as creating survey forms, identifying appropriate crops or fruit-bearing trees, assessing processed food products, selecting tools and materials, constructing simple electrical devices, and observing safety practices. These learning experiences call for more than the memorization of concepts. Learners must understand instructions, prepare the needed materials, carry out a sequence of procedures, and produce an acceptable output. Such demands make practical skills readiness an important concern in determining whether Grade 6 learners are prepared to participate successfully in TLE activities (Layacan, 2020).

Practical skills readiness may be understood as the learner's preparedness to perform age-appropriate tasks with care, accuracy, safety, and a reasonable degree of independence. It includes the ability to select and use tools properly, follow procedures, manage time and materials, correct simple errors, and evaluate a finished product. Readiness also involves the willingness to begin a task and persist when difficulties arise. A learner may know the steps of an activity but still hesitate to apply them without constant assistance. Another learner may show interest but lack the basic skills needed to complete the task safely. For this reason, readiness reflects the combined presence of knowledge, performance ability, confidence, responsibility, and work habits. These qualities influence how learners respond when they are asked to prepare food, develop a simple product, work with plants, use digital tools, or complete a basic livelihood project.

The value of practical work is strengthened when learners are given tasks that connect classroom lessons with actual needs and situations. UNESCO-UNEVOC explains that entrepreneurial learning is better supported through practical methods in which students create products, deliver services, solve problems, and participate in activities that resemble real work processes. In these activities, learners are not passive recipients of information. They take part in planning, production, decision-making, and evaluation, while teachers guide and support the learning process. The use of authentic tasks can help learners see why a procedure matters and how individual skills contribute to a useful result. This form of learning also allows technical abilities to develop alongside communication, teamwork, resource management, and personal responsibility (UNESCO-UNEVOC International Centre for Technical and Vocational Education and Training, 2020).

Practical readiness alone, however, does not guarantee that learners will take an active interest in entrepreneurial activities. Learners must also be willing to participate, contribute ideas, complete assigned responsibilities, and reflect on the outcome of their work. Entrepreneurial learning engagement refers to the attention, effort, interest, and participation that learners show during activities involving planning, production, budgeting, promotion, problem-solving, and value creation. It may be seen when learners ask questions, offer suggestions, cooperate with classmates, improve a product, calculate costs, explain their decisions, or complete a task despite difficulty. Engagement therefore includes observable participation as well as the thought and personal interest invested in an activity.

The design of learning activities can influence the level of engagement shown by students. Liu et al. (2022) found that a challenging learning environment was positively associated with study engagement and entrepreneurial self-efficacy. Supportive relationships between teachers and students were also connected with stronger engagement. Although their participants were university students, the findings offer a useful educational point for younger learners. Tasks need to be challenging enough to encourage effort but should remain suited to the learners' abilities. Expectations must be understandable, guidance must be available, and learners should feel that their contributions are valued. In a Grade 6 TLE class, engagement may weaken when tasks are too difficult, tools are unfamiliar, procedures are unclear, or learners receive little opportunity to make decisions. It may

improve when activities are structured, manageable, practical, and supported by constructive teacher guidance (Liu et al., 2022).

Experiential learning offers another explanation for the connection between practical activities and learner engagement. Kong (2021) explained that experiential learning places learners in an active role by allowing them to gain knowledge through experience, participation, reflection, and application. This approach can support classroom motivation and engagement because learners are able to connect a lesson with something they have personally performed or observed. In TLE, a learner who prepares a product, identifies its cost, presents it to classmates, and reflects on possible improvements receives a fuller learning experience than one who only reads about the process. Practical experience gives learners a reason to pay attention because the quality of their decisions affects the outcome of the activity. It also makes improvement visible, allowing learners to recognize what they can already do and which abilities still require practice.

Entrepreneurial education may also shape how learners view their own abilities. Wardana et al. (2020) found that entrepreneurship education influenced entrepreneurial self-efficacy, attitudes, and mindset among students. Their findings suggest that learning experiences can affect whether students believe they are capable of completing entrepreneurial tasks and whether they view such activities positively. Self-efficacy is relevant to practical skills because learners who trust their ability are more likely to attempt a task, continue working after a mistake, and accept responsibility for their output. Yet confidence must be supported by actual competence. Encouragement without sufficient practice may not prepare learners to handle materials, follow safety procedures, or make sound decisions. Practical readiness and positive engagement should therefore be developed together through repeated, supervised, and meaningful activities.

Studies on entrepreneurship education have reported generally positive outcomes, but the effects differ according to the teaching method, learning environment, participants, and outcomes being measured. Nabi et al. (2017), through a systematic review of 159 studies, observed that entrepreneurship education research often focused on short-term and self-reported outcomes. They also found that many studies provided limited descriptions of the actual teaching methods used. Much of the available empirical work has examined university students or learners in technical and vocational institutions. This leaves a need for evidence that explains how entrepreneurial learning operates among elementary learners who are still developing foundational practical abilities, confidence, and work habits. Research at the Grade 6 level can help determine whether learners who consider themselves prepared for practical tasks also show stronger attention, effort, participation, and interest during entrepreneurial learning activities.

Grade 6 is an appropriate level for examining these concerns because learners are expected to perform tasks with increasing responsibility while still requiring guidance suited to their age and experience. Their TLE activities may introduce them to production, resource management, digital work, household skills, agricultural practices, and simple entrepreneurial decisions. Differences in previous experience, access to materials, confidence, task familiarity, and support may affect how prepared they feel and how actively they participate. A learner who can follow procedures, manage tools, and complete a product may approach entrepreneurial activities with greater confidence and interest. In contrast, limited readiness may lead to hesitation, dependence on others, reduced participation, or avoidance of demanding tasks. These possibilities need to be examined through evidence drawn directly from the learners.

For this reason, the study seeks to determine the level of learners' practical skills readiness, assess their entrepreneurial learning engagement, and examine whether a significant relationship exists between the two variables. The study will focus on Grade 6 learners of Old San Mariano Integrated School in Old San Mariano, San Mariano, Isabela. Its findings may provide teachers with a clearer basis for designing practical activities that match learners' abilities while encouraging active participation, creativity, responsibility, and interest in entrepreneurial work. The results may also guide the preparation of learning support, performance tasks, and classroom strategies that allow Grade 6 learners to develop practical competence through experiences that are useful, understandable, and connected with everyday life.

Literature Review

Practical Learning Readiness

Practical learning readiness refers to the condition that enables learners to participate safely, confidently, and effectively in activities requiring the application of knowledge and skills. It is not limited to knowing the steps of a task because learners must also be physically prepared, psychologically willing, and equipped with the supporting knowledge needed for performance. Kholifah et al. (2024) examined practical learning readiness through three dimensions: supporting knowledge, physical condition, and psychological condition. Their findings showed that psychological preparedness made the strongest contribution to overall readiness, suggesting that confidence, motivation, emotional stability, and willingness to participate influence how learners approach practical work. Supporting knowledge was equally important because learners need to understand tools, materials, procedures, and safety requirements before performing an activity. Applied to Grade 6 TLE, practical skills readiness may be observed through a learner's ability to prepare materials, follow instructions, use simple tools responsibly, manage time, and complete assigned work with decreasing dependence on the teacher. Learners who possess the necessary knowledge but lack confidence may hesitate to participate, while those who are eager but insufficiently prepared may commit errors or require constant assistance. Measuring practical skills readiness should therefore consider what learners know, what they can perform, and how prepared they feel when completing TLE tasks.

Project-Based Development of Practical Skills

Project-based activities provide learners with opportunities to apply knowledge while producing a concrete output. Rather than treating practical skills as isolated procedures, this approach allows learners to plan a task, select resources, solve problems, perform a sequence of actions, and evaluate the quality of a finished product. Guo et al. (2020) reviewed research on project-based learning and identified the production of artifacts as one of its central characteristics. The reviewed studies assessed not only knowledge but also behavioral outcomes such as skills, participation, and engagement. This finding is useful for TLE because learner performance is often demonstrated through products, projects, demonstrations, and other observable tasks. A Grade 6 learner may understand entrepreneurship concepts more clearly when allowed to develop a simple product, determine the materials needed, estimate expenses, work with classmates, and present the completed output. Such activities can reveal whether the learner applies instructions accurately, responds to difficulties, and accepts responsibility for assigned work. Practical projects must nevertheless be suited to the learner's age, prior experience, and available resources. Tasks that are too difficult may produce dependence and frustration, while tasks that provide no meaningful challenge may fail to encourage careful thinking and sustained effort. Well-planned projects can unite practical performance and entrepreneurial learning by giving learners a clear purpose for using their skills.

Entrepreneurial Competencies among School Learners

Entrepreneurial learning among school learners involves a combination of personal qualities, teamwork abilities, and basic economic skills rather than preparation for immediate business ownership. Brahm and Grewe (2023) developed and validated an instrument for measuring entrepreneurial competencies among students participating in school-based companies. Their framework organized entrepreneurial competence into economic, team, and personal levels. Economic competencies included planning, organizing, using resources, solving problems, thinking creatively, and recognizing risks. Team competencies covered communication, cooperation, networking, and opportunity recognition, while personal competencies included independence, responsibility, perseverance, reflection, self-awareness, and confidence. These areas are relevant to Grade 6 TLE because entrepreneurial activities commonly require learners to work with limited materials, contribute ideas, perform assigned roles, improve a product, and explain how an output may provide value to others. The framework also shows that entrepreneurial development should not be judged only through interest in selling products or earning income. Learners may demonstrate entrepreneurial growth through responsible work habits, initiative,

resourcefulness, collaboration, and the willingness to improve an idea. For the present study, these competencies help explain the behaviors that may appear when Grade 6 learners become meaningfully engaged in entrepreneurial learning activities.

Engagement in Practical and Vocational Learning

Learner engagement in practical subjects can be seen through active participation, sustained attention, effort, cooperation, and willingness to complete demanding activities. Zhao and Ko (2020) examined teaching practices and student engagement in vocational classrooms through classroom observations and field notes. Their study showed that vocational instruction involved varied teaching behaviors that responded to the demands of practical learning. Engagement was shaped not only by the learner's personal interest but also by how teachers organized tasks, explained procedures, guided practice, and adjusted instruction according to learner needs. This principle is applicable to Grade 6 TLE, where pupils may differ in their familiarity with tools, access to materials, confidence, and ability to work independently. Clear demonstrations, manageable instructions, timely assistance, and meaningful performance tasks can help learners participate more fully. Entrepreneurial learning engagement may be evident when pupils remain attentive during demonstrations, contribute ideas during planning, cooperate in group tasks, make decisions about resources, and persist until an output is completed. Engagement should therefore be examined as more than enjoyment or attendance. It includes the behavioral effort, emotional interest, and thoughtful involvement that learners bring to practical and entrepreneurial activities. Understanding these forms of participation can help determine whether practical skills readiness is associated with stronger engagement among Grade 6 TLE learners.

METHODS

Research Design

The study employed a cross-sectional explanatory association design to examine how practical skills readiness was related to entrepreneurial learning engagement among Grade 6 TLE learners. This design was selected because the study measured the two variables as they naturally occurred during the same academic period without introducing an intervention or changing the learners' regular classroom activities. Unlike a purely descriptive correlational design, the explanatory association approach allowed the researchers to determine not only whether the variables moved together but also whether variations in practical skills readiness statistically explained variations in entrepreneurial learning engagement. Practical skills readiness served as the explanatory variable, while entrepreneurial learning engagement served as the outcome variable. The design did not establish direct causation because the learners were observed at only one period and were not randomly assigned to experimental conditions.

Research Locale

The study was conducted at Old San Mariano Integrated School in Barangay Old San Mariano, San Mariano, Isabela. The school was selected because it offered Grade 6 Technology and Livelihood Education and provided an appropriate setting for examining learners' preparedness for skill-oriented activities and their participation in entrepreneurial learning tasks. TLE lessons in the school exposed learners to activities that required the use of materials, observance of procedures, completion of performance tasks, and application of basic entrepreneurial ideas. The setting allowed the study to examine the variables within the actual learning environment where practical and entrepreneurial competencies were taught and demonstrated.

Participants and Sampling Technique

The participants were Grade 6 learners who were officially enrolled at Old San Mariano Integrated School and were taking Technology and Livelihood Education during the period of data collection. Learners were included when they had attended TLE classes, obtained written consent from a parent or legal guardian, and

provided their own assent to participate. Learners who joined the pilot administration of the questionnaire were not included in the main study.

Systematic random sampling with a random starting point was used to select the participants from the official Grade 6 enrolment list. Each eligible learner was assigned a sequence number based on the class list. A sampling interval was calculated by dividing the eligible population by the required sample size. The first participant was selected through a random draw, after which every learner corresponding to the sampling interval was included. When a selected learner did not meet the consent requirements or was unavailable during the scheduled administration, the next eligible learner on the list was considered. This procedure gave eligible learners a known and reasonably equal opportunity to be selected while preventing the researcher from choosing participants based on academic standing, classroom behavior, or personal familiarity.

Research Instrument

Data were collected through a researcher-developed questionnaire composed of two scales. The first scale measured practical skills readiness through statements concerning procedural understanding, tool and material preparation, safe task performance, work organization, problem-solving, and independent completion of practical activities. The second scale assessed entrepreneurial learning engagement through items addressing attention, participation, initiative, idea contribution, teamwork, persistence, resourcefulness, and involvement in product-oriented or value-creating activities. The statements were written in language appropriate for Grade 6 learners and avoided technical expressions that could interfere with comprehension.

A four-point response format was used to lessen uncertainty among young respondents. The practical skills readiness scale used the response categories Not Yet Ready, Slightly Ready, Ready, and Highly Ready. The entrepreneurial learning engagement scale used Never, Sometimes, Often, and Always. The questionnaire did not request names, grades, family income, sex, or other personal profile information because these details were not included in the research objectives.

The initial version of the instrument underwent content and face validation. A panel composed of specialists in TLE instruction, elementary education, educational research, and assessment examined each statement for relevance, clarity, age appropriateness, alignment with the variables, and suitability for the local school setting. Their evaluations were summarized using the item-level content validity index and the scale-level content validity index based on average agreement. The item-level content validity indices ranged from .83 to 1.00, while the final instrument obtained a scale-level content validity index based on average agreement of .94. This result indicated excellent agreement among the validators regarding the relevance and appropriateness of the questionnaire items. Statements that received recommendations for revision were simplified, combined, or reworded before pilot administration.

The revised questionnaire was pilot-tested among Grade 6 learners from a comparable public school who were not included in the main investigation. The pilot administration assessed whether the directions, statements, response options, and estimated completion time were understandable to learners of the same educational level. Responses were examined for missing data, limited variation, confusing wording, and excessive similarity between items. Minor revisions were made to several statements to improve sentence clarity and reduce repetition.

Internal consistency was evaluated using Cronbach's alpha. The practical skills readiness scale produced an alpha coefficient of .89, indicating good internal consistency. The entrepreneurial learning engagement scale obtained an alpha coefficient of .91, indicating excellent internal consistency. The complete questionnaire yielded an overall Cronbach's alpha of .93, which demonstrated that the instrument had excellent reliability for measuring the two study variables. The corrected item-total correlations ranged from .42 to .76, and no item produced a meaningful increase in reliability when deleted. All retained statements therefore contributed adequately to their respective scales. The combined evidence from expert validation, pilot administration, and internal consistency analysis supported the use of the questionnaire in the main data collection.

Data Gathering

Approval to conduct the study was secured from the appropriate school authorities before any participant was approached. After permission was granted, the researcher coordinated with the Grade 6 class adviser and TLE teacher to identify an administration schedule that did not interfere with examinations, major performance tasks, or required school activities. The official enrolment list was used only for sampling and was not attached to the completed questionnaires.

Parent or guardian consent forms were distributed before the scheduled administration. The purpose of the study, expected participation, possible inconvenience, confidentiality measures, and voluntary nature of involvement were explained in clear language. Learners whose parents or guardians provided consent were separately asked to sign an assent form. The learners were informed that participation or nonparticipation would not influence their grades, classroom standing, access to school services, or relationship with their teachers.

The questionnaire was administered in a classroom setting under standardized conditions. A person who was not directly responsible for assigning the learners' TLE grades assisted in the administration to reduce pressure arising from the teacher-student relationship. The directions and response categories were explained before the learners began. Clarifications were limited to the meaning of instructions and unfamiliar words. No examples were given that could influence the learners' responses.

Completed questionnaires were checked only for unanswered items while the learners were still present. Participants were allowed to complete accidentally omitted statements, but they were not required to answer any item they preferred to leave blank. Each questionnaire was assigned a code rather than a learner's name. The responses were encoded in a password-protected data file and compared with the original questionnaires to identify encoding errors. The paper copies were stored in a secure location accessible only to the researcher.

Data Analysis

The data were examined before the main statistical analysis. Responses with substantial missing information or evident non-engagement, such as uniform answers across all items without variation, were reviewed according to predetermined screening rules. Negatively worded items, when present, were reverse-scored before the composite scores were calculated. Each learner's practical skills readiness score and entrepreneurial learning engagement score was obtained by averaging the valid responses within the corresponding scale.

Because the questionnaire used ordered response categories and the resulting scores could contain tied values and departures from normality, medians and interquartile ranges were used as the principal descriptive measures. The percentage distribution for each response category was also reported to show how the learners answered individual statements. Means and standard deviations were retained only as supplementary summaries when required by the target journal.

Kendall's tau-b was used to determine the strength and direction of the association between practical skills readiness and entrepreneurial learning engagement. This statistic was selected because it handled ordinal measurements and adjusted for tied scores, which commonly occurred when learners used a four-point response scale. A positive coefficient indicated that higher practical skills readiness tended to occur with stronger entrepreneurial learning engagement, while a negative coefficient indicated an inverse ordering of the scores.

The relationship was further examined through Theil-Sen robust regression. This method estimated the typical change in entrepreneurial learning engagement associated with a one-unit increase in practical skills readiness by calculating a median slope rather than relying entirely on ordinary least squares assumptions. It was less sensitive to extreme observations, unequal score distributions, and non-normal residuals. Bias-corrected and accelerated bootstrap confidence intervals were generated for the Kendall coefficient and the Theil-Sen slope. The bootstrap procedure used repeated resampling of the observed cases to provide a more stable estimate of uncertainty.

Statistical significance was evaluated at the .05 level. However, interpretation did not rely on the probability value alone. The direction, magnitude, confidence interval, and practical educational meaning of each

estimate were considered. A confidence interval that did not cross zero was interpreted as evidence of a statistically supported association. The results were described as associative rather than causal because the design did not involve temporal follow-up or experimental manipulation.

Ethical Consideration

The study observed the ethical requirements applicable to research involving school-age children. Participation remained voluntary, and both parental or guardian consent and learner assent were obtained before data collection. The participants were informed that they could refuse to answer a statement or withdraw from the study without penalty. No learner was pressured to participate, and no academic reward, grade adjustment, or special classroom privilege was offered in exchange for participation.

Confidentiality was protected by excluding names and direct personal identifiers from the questionnaire. Identification codes were used only to organize the data and were not linked to academic records. Individual responses were not shown to classroom teachers, classmates, parents, or school personnel. Findings were presented in summarized form so that no learner could be recognized from the report.

The study was considered to involve minimal risk because it required only the completion of a questionnaire concerning ordinary learning experiences. Nevertheless, learners were reminded that they could pause or stop answering when they felt uncomfortable. The researcher avoided statements that could embarrass learners or make them feel academically inadequate. The wording focused on readiness and engagement rather than failure, weakness, or deficiency.

Digital files were protected with a password, while printed questionnaires and consent documents were stored separately in a secured location. The data were used only for the stated research purpose and were retained according to the approved institutional retention period. After that period, electronic records were permanently deleted and paper documents were destroyed through secure shredding. The researcher also declared any role-related conflict and took steps to prevent authority over learners from affecting consent, participation, or responses.

RESULTS AND DISCUSSION

Table 1. *Level of Practical Skills Readiness among Grade 6 TLE Learners*

Dimension	Median	Interquartile Range	Interpretation	Rank
Safe task performance	3.34	0.42	Highly Ready	1
Procedural understanding	3.28	0.44	Highly Ready	2
Tool and material preparation	3.16	0.50	Ready	3
Work organization	3.02	0.54	Ready	4
Problem-solving during practical tasks	2.83	0.61	Ready	5
Independent task completion	2.44	0.67	Slightly Ready	6
Overall Practical Skills Readiness	3.01	0.46	Ready	

Scale: 1.00 to 1.75 = Not Yet Ready; 1.76 to 2.50 = Slightly Ready; 2.51 to 3.25 = Ready; 3.26 to 4.00 = Highly Ready.

Table 1 shows that the Grade 6 TLE learners were generally ready to perform practical activities, as reflected by the overall median of 3.01 and an interquartile range of 0.46. This result indicated that most learners possessed the basic knowledge and abilities needed to participate in practical tasks, although their readiness was not consistently high across all areas. The relatively narrow interquartile range suggested that the responses were concentrated around the ready category, with limited differences among most participants.

Safe task performance received the highest median of 3.34. This finding showed that learners were able to observe basic safety procedures, handle materials carefully, and recognize the importance of avoiding actions

that could cause injury or damage. Procedural understanding also obtained a highly ready interpretation, with a median of 3.28. The result suggested that learners generally understood the sequence of steps required in familiar practical activities. Their strong scores in safety and procedural understanding may have resulted from repeated classroom demonstrations, teacher reminders, and structured instructions before practical work.

Tool and material preparation received a median of 3.16, while work organization obtained 3.02. These findings indicated that learners were able to prepare basic materials and organize their work when clear directions were provided. However, their readiness may still have depended on teacher supervision, particularly when tasks involved unfamiliar tools or several procedures. Practical readiness involves not only knowing what materials are needed but also using available resources carefully and preparing the work area without continuous assistance. The result supported the view that readiness includes knowledge, physical preparation, and psychological willingness to carry out practical activities (Kholifah et al., 2024).

Problem-solving during practical tasks obtained a median of 2.83. Although this was interpreted as ready, it was lower than the scores for safety, procedural understanding, and material preparation. The result indicated that some learners experienced difficulty when instructions did not directly address an unexpected problem. They may have been able to follow established procedures but were less certain when they needed to correct an error, substitute a material, or adjust a process. This finding revealed a need to provide activities that allow learners to make decisions instead of merely copying a demonstrated procedure.

Independent task completion received the lowest median of 2.44 and was interpreted as slightly ready. This was the clearest practical skills concern identified in the study. Many learners appeared capable of beginning an activity but still needed reminders, confirmation, or direct assistance before finishing their work. The result suggested that competence was stronger when the activity was closely guided and weaker when learners were expected to manage the entire process independently. Practical projects should therefore move gradually from teacher-directed demonstrations toward guided practice and independent performance. Project-based learning becomes more meaningful when learners assume responsibility for planning, decision-making, production, and evaluation rather than simply completing predetermined steps (Guo et al., 2020).

Table 2. *Level of Entrepreneurial Learning Engagement among Grade 6 TLE Learners*

Dimension	Median	Interquartile Range	Interpretation	Rank
Teamwork and cooperation	3.36	0.40	Always	1
Attention to entrepreneurial activities	3.31	0.43	Always	2
Participation in assigned activities	3.19	0.49	Often	3
Persistence in completing activities	3.08	0.55	Often	4
Involvement in product and value-creating tasks	2.74	0.59	Often	5
Contribution of ideas	2.68	0.62	Often	6
Initiative in beginning or extending tasks	2.46	0.65	Sometimes	7
Resourcefulness in using available materials	2.41	0.68	Sometimes	8
Overall Entrepreneurial Learning Engagement	2.92	0.48	Often	

Scale: 1.00 to 1.75 = Never; 1.76 to 2.50 = Sometimes; 2.51 to 3.25 = Often; 3.26 to 4.00 = Always.

Table 2 reveals that the learners were often engaged in entrepreneurial learning activities, based on the overall median of 2.92 and an interquartile range of 0.48. This indicated that they regularly participated in activities involving practical work, product preparation, cooperation, and basic entrepreneurial decision-making. However, the overall result remained below the highest engagement category, which showed that active participation was not equally sustained across all aspects of entrepreneurial learning.

Teamwork and cooperation ranked first, with a median of 3.36. This finding showed that the learners were comfortable performing tasks with classmates, sharing responsibilities, and assisting group members. Grade 6 learners may have found group activities less demanding because responsibility was distributed among several

members. Working with classmates may also have increased confidence among learners who were uncertain about completing a task alone. Team competence is an important part of entrepreneurial learning because value-creating activities often require communication, role assignment, negotiation, and shared decision-making (Brahm & Grewe, 2023).

Attention to entrepreneurial activities obtained a median of 3.31, indicating that learners regularly listened to instructions and showed interest during discussions and demonstrations. Participation in assigned activities also received a favorable median of 3.19. These results suggested that learners were responsive when tasks were organized by the teacher and when their responsibilities were clearly specified. Persistence received a median of 3.08, showing that most learners attempted to finish activities despite minor difficulty.

Lower results emerged in areas that required personal initiative and flexible decision-making. The contribution of ideas received a median of 2.68, while initiative obtained 2.46. Learners were therefore more engaged when carrying out assigned roles than when proposing their own activities or extending a task beyond the minimum requirements. This pattern suggested that engagement was largely responsive rather than self-directed. The learners participated when instructed, but fewer of them independently suggested product improvements, volunteered for additional responsibilities, or began tasks without prompting.

Resourcefulness received the lowest median of 2.41. This indicated that learners sometimes struggled to identify alternative materials or develop solutions when their preferred resources were unavailable. A learner may have stopped working or waited for teacher assistance when an item was missing, rather than considering another material that could serve the same purpose. This problem was consistent with the relatively low score obtained for practical problem-solving. The parallel weakness suggested that learners needed more opportunities to make choices, test ideas, manage limited resources, and learn from manageable mistakes.

The findings showed that high attention and cooperation did not automatically result in strong initiative or resourcefulness. Classroom engagement may remain dependent on teacher guidance when practical tasks are highly controlled. Teaching quality, task organization, procedural explanation, and appropriate guidance can strengthen participation, but learners must also be given meaningful opportunities to exercise judgment and responsibility (Zhao & Ko, 2020). TLE activities may therefore be improved by including open-ended problems, material substitution exercises, simple product redesign, and learner-generated project ideas.

Table 3. Kendall's Tau-b Association between Practical Skills Readiness and Entrepreneurial Learning Engagement

Practical Skills Readiness Dimension	Kendall's Tau-b	BCa 95% Confidence Interval	Probability Value	Interpretation
Procedural understanding	0.341	0.214 to 0.458	< .001	Moderate positive association
Tool and material preparation	0.293	0.164 to 0.410	.002	Weak positive association
Safe task performance	0.238	0.104 to 0.365	.008	Weak positive association
Work organization	0.382	0.254 to 0.496	< .001	Moderate positive association
Problem-solving during practical tasks	0.451	0.331 to 0.558	< .001	Moderate positive association
Independent task completion	0.472	0.350 to 0.579	< .001	Moderate positive association
Overall Practical Skills Readiness	0.414	0.286 to 0.529	< .001	Moderate positive association

BCa = Bias-corrected and accelerated bootstrap confidence interval.

Table 3 shows a statistically significant moderate positive association between overall practical skills readiness and entrepreneurial learning engagement. Kendall's tau-b was 0.414, with a bias-corrected and accelerated 95 percent confidence interval ranging from 0.286 to 0.529. The probability value was below .001.

Since the confidence interval did not include zero, the result provided sufficient evidence that learners with stronger practical skills readiness generally demonstrated greater entrepreneurial learning engagement.

The moderate association indicated that practical readiness and entrepreneurial engagement were meaningfully connected but were not identical. Learners who knew how to organize materials, follow procedures, solve practical problems, and finish tasks independently were more likely to participate actively, contribute effort, and persist in entrepreneurial activities. However, practical readiness alone did not fully determine engagement. Other factors, such as teacher support, peer relationships, access to resources, task difficulty, personal interest, and previous experience, may also have influenced the learners' participation.

Independent task completion produced the strongest dimension-level association with entrepreneurial engagement, with a tau-b coefficient of 0.472. This result was important because independent completion had also received the lowest practical readiness score. Learners who were better able to complete work without repeated assistance showed stronger participation and involvement in entrepreneurial tasks. The finding suggested that independence may be a central link between practical competence and entrepreneurial engagement. Learners who could manage their work were more capable of taking responsibility for a product or project.

Problem-solving followed closely, with a coefficient of 0.451. Learners who could respond to errors and practical difficulties tended to demonstrate stronger engagement. Entrepreneurial activities require learners to adjust their plans, manage limited resources, and continue working when the first attempt does not succeed. Therefore, problem-solving may have helped learners remain involved rather than withdrawing when a task became difficult.

Work organization and procedural understanding also showed moderate positive associations with engagement. Learners who understood the sequence of tasks and managed their working area effectively were more likely to participate consistently. Tool preparation and safe performance had weaker but statistically significant associations. Safety and preparation may have supported engagement, but these abilities were often performed through compliance with established directions. By comparison, problem-solving and independent completion required more personal decision-making, which may explain their stronger relationship with entrepreneurial learning engagement.

The findings supported the view that entrepreneurial competence involved personal responsibility, perseverance, independence, creativity, and the ability to convert knowledge into action (Brahm & Grewe, 2023). The results also indicated that a learner who was practically prepared had a stronger foundation for becoming actively involved in value-creating work. Strengthening readiness may therefore support engagement, particularly when instruction moves beyond procedure-following and allows learners to make decisions.

Table 4. *Theil-Sen Robust Regression of Entrepreneurial Learning Engagement on Practical Skills Readiness*

Parameter	Robust Estimate	BCa 95% Confidence Interval	Probability Value	Interpretation
Intercept at the median readiness score	2.93	2.84 to 3.02	< .001	Expected engagement at typical readiness
Practical skills readiness slope	0.46	0.32 to 0.61	< .001	Significant positive estimate
Median absolute residual	0.27			Moderate unexplained variation

The practical skills readiness score was centered at its median before estimation.

The Theil-Sen analysis confirmed that practical skills readiness was a significant positive statistical predictor of entrepreneurial learning engagement. The estimated slope was 0.46, with a bias-corrected and accelerated 95 percent confidence interval from 0.32 to 0.61. The interval remained entirely above zero, confirming that the positive estimate was statistically supported.

The slope indicated that a one-point increase in practical skills readiness was associated with an estimated 0.46-point increase in entrepreneurial learning engagement. This was an educationally meaningful difference within a four-point measurement scale. Learners who moved from slight readiness toward readiness were expected

to show a noticeable improvement in their participation, effort, persistence, and involvement in entrepreneurial activities.

At the median practical readiness score, the expected entrepreneurial engagement score was 2.93. This value corresponded to the often category and closely matched the observed overall engagement median. The consistency between the observed and estimated results strengthened the interpretation that the robust model represented the general response pattern without being heavily influenced by unusual scores.

The median absolute residual of 0.27 showed that some variation in engagement remained unexplained. This finding was realistic because learner engagement was influenced by more than practical competence. A learner could possess practical abilities but show limited interest in a particular activity. Another learner could demonstrate high enthusiasm while still needing assistance with technical procedures. The model therefore identified practical skills readiness as a meaningful explanatory factor without treating it as the sole source of entrepreneurial learning engagement.

The results suggested that improving practical skills readiness could contribute to stronger entrepreneurial participation. However, the design did not establish a cause-and-effect relationship because both variables were measured during the same period and no experimental intervention was implemented. The finding should therefore be interpreted as evidence of a consistent explanatory association rather than proof that readiness directly caused engagement.

CONCLUSION

The Grade 6 TLE learners demonstrated an adequate level of practical skills readiness and generally showed favorable entrepreneurial learning engagement, particularly in teamwork, attention, safe task performance, and procedural understanding; however, weaknesses remained in independent task completion, initiative, resourcefulness, and practical problem-solving. The significant positive association between practical skills readiness and entrepreneurial learning engagement indicated that learners who were better prepared to organize materials, follow procedures, solve difficulties, and complete tasks independently were also more likely to participate actively and persist in entrepreneurial learning activities. Based on these findings, TLE teachers are encouraged to design progressive performance tasks that begin with guided practice and gradually require greater learner independence, decision-making, and responsibility. Classroom activities should include simple product development, material substitution, budgeting, task planning, and problem-solving situations that allow learners to make choices and improve their outputs. Teachers should also balance cooperative work with individual accountability so that each learner develops practical competence rather than depending heavily on group members. The school administration may support these efforts by providing adequate materials, practical learning spaces, teacher training, and opportunities for school-based entrepreneurial projects. Future researchers may examine other factors affecting entrepreneurial engagement, such as teacher support, family exposure to livelihood activities, access to learning resources, self-efficacy, and prior practical experience, and may use longitudinal or intervention-based designs to determine how practical skills and entrepreneurial engagement develop over time.

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