Implementation of Problem-Based Learning and Soft Skills Acquisition Among Trainees in Technical And Vocational Education and Training Institutions in Uasin Gishu County, Kenya

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DOI: https://doi.org/10.51584/IJRIAS.2026.11100002

Received: 06 October 2026; Accepted: 12 October 2026; Published: 28 October 2026

ABSTRACT

Technical and Vocational Education and Training (TVET) institutions are increasingly expected to prepare graduates who possess both occupational competencies and transferable workplace skills. Contemporary workplaces require employees who can communicate effectively, collaborate with others, think critically, solve problems, make informed decisions, and adapt to changing environments. Problem-based learning (PBL) provides opportunities for developing these competencies by engaging learners in authentic problems, investigation, collaboration, evaluation of alternatives, and evidence-based decision-making. However, empirical evidence regarding its implementation and contribution to soft skills development within Kenyan TVET contexts remains limited.This study examined the relationship between problem-based learning implementation and soft skills acquisition among trainees in public TVET institutions in Uasin Gishu County, Kenya. The study was guided by constructivist and experiential learning perspectives and adopted a mixed-methods approach using a descriptive survey research design. The target population comprised 495 trainees, 71 trainers, and eight principals from public TVET institutions in Uasin Gishu County. A sample consisting of 418 trainees, 71 trainers, and eight principals was selected through stratified, simple random, and purposive sampling techniques. Data were collected using questionnaires and semi-structured interview schedules. Problem-based learning implementation was assessed through indicators including exposure to authentic workplace problems, investigation of alternative solutions, inquiry and research practices, collaborative discussion, evidence-based decision-making, workplace scenarios, and problem-solving experiences. Soft skills acquisition was assessed through competencies including communication, teamwork, critical thinking, problem-solving, decision-making, adaptability, and workplace confidence. Reliability of the research instruments was assessed through pilot testing and Cronbach's alpha coefficient, while validity was enhanced through expert review and alignment with the study objectives. Quantitative data were analysed using descriptive statistics, Chi-square tests, and regression analysis, while qualitative data were analysed thematically. The findings revealed significant implementation gaps in key elements of problem-based learning. Many trainees reported limited exposure to authentic workplace problems, investigation of alternative solutions, inquiry activities, and evidence-based decision-making. However, problem-based learning demonstrated a statistically significant association with soft skills acquisition, $\chi^2(4, N = 418) = 22.315$, $p < .001$. Regression analysis also indicated a statistically significant relationship between problem-based learning and soft skills acquisition, $F(1,418) = 6.381$, $p = .012$. Nevertheless, the model explained only 0.9% of the variance in soft skills acquisition ($R^2 = .009$), indicating that problem-based learning alone does not sufficiently explain differences in trainees' soft skills development. The study concludes that problem-based learning has potential to support soft skills acquisition when implemented through authentic workplace problems, inquiry-based learning, meaningful collaboration, evidence-based decision-making, trainer facilitation, and reflection. However, soft skills development is influenced by multiple institutional, learner, and contextual factors beyond instructional strategy alone. The study recommends strengthening industry-aligned problem design, trainer capacity development, collaborative learning processes, and institutional support systems to enhance the effectiveness of problem-based learning within TVET institutions.

Keywords: Problem-based learning; soft skills acquisition; Technical and Vocational Education and Training; competency-based education and training; workplace learning; Kenya.

INTRODUCTION

Technical and Vocational Education and Training (TVET) institutions play a critical role in preparing individuals with the competencies required for employment, entrepreneurship, and socio-economic development. Traditionally, TVET systems have focused on developing occupational knowledge and practical skills required for specific trades and professions. However, changing labour market demands arising from technological advancement, globalization, automation, and evolving workplace structures have increased the need for graduates who possess both technical competencies and transferable workplace skills.

Modern workplaces increasingly require employees who can communicate effectively, collaborate with others, analyse situations, solve unfamiliar problems, make informed decisions, and adapt to changing circumstances. These competencies, commonly referred to as soft skills, have become essential determinants of employability, workplace performance, and career progression. Consequently, contemporary TVET institutions are expected to produce graduates who can apply technical knowledge while demonstrating communication, teamwork, critical thinking, creativity, adaptability, and professional judgement (Dominico, 2025; Bisschoff & Massyn, 2025).

Developing soft skills presents a significant challenge because these competencies cannot be adequately developed through passive learning approaches alone. Skills such as problem-solving, critical thinking, collaboration, and decision-making require learners to actively engage in situations where they analyse information, evaluate alternatives, justify decisions, and reflect on outcomes. Therefore, instructional strategies that promote active participation, inquiry, and practical engagement are increasingly important within competency-based training environments (Hmelo-Silver, 2004).

Problem-based learning (PBL) has emerged as an important learner-centred instructional approach that can support the development of such competencies. Unlike traditional approaches where learners primarily receive predetermined information, problem-based learning organizes learning around complex problems that require investigation, analysis, collaboration, and solution development. Through this process, learners identify knowledge gaps, gather relevant information, evaluate possible solutions, communicate ideas, and make evidence-based decisions (Hmelo-Silver, 2004).

Within TVET environments, problem-based learning is particularly relevant because vocational competence requires the ability to apply knowledge within realistic occupational situations. Trainees in technical and vocational fields frequently encounter workplace challenges involving resource limitations, technical constraints, safety considerations, and decision-making requirements. Addressing these challenges requires not only technical knowledge but also the ability to communicate, collaborate, analyse problems, and make appropriate decisions (Strobel & Van Barneveld, 2009).

The theoretical foundation of problem-based learning is consistent with constructivist learning perspectives, which view learning as an active process where individuals construct knowledge through interaction, experience, collaboration, and reflection. Within a problem-based learning environment, trainers facilitate learning by guiding trainees through problem identification, investigation, solution development, and reflection. This process encourages learners to develop independence, confidence, and the ability to apply knowledge in unfamiliar situations (Vygotsky, 1978).

Experiential learning perspectives also support problem-based learning because they emphasize learning through practical experience, reflection, conceptual understanding, and application. In TVET contexts, authentic workplace problems provide opportunities for trainees to connect classroom knowledge with real occupational situations. Through engagement with practical challenges, learners develop the ability to evaluate situations, consider alternative responses, and improve future decision-making (Kolb, 1984).

However, the effectiveness of problem-based learning depends greatly on implementation quality. The presence of problem-solving activities alone does not necessarily result in meaningful learning outcomes. Effective problem-based learning requires authentic workplace problems, opportunities for inquiry and research, investigation of alternative solutions, collaborative discussion, evidence-based decision-making, trainer facilitation, and reflection. Where these elements are limited, the potential contribution of problem-based learning to soft skills development may be reduced (Hmelo-Silver, 2004).

Globally, problem-based learning has gained attention as an approach for strengthening employability competencies within education and training systems. The approach has been associated with improved critical thinking, communication, collaboration, and problem-solving abilities. However, evidence from developing-country TVET contexts remains limited, particularly regarding how problem-based learning is implemented and the extent to which it contributes to trainees' soft skills acquisition (Hmelo-Silver, 2004; Strobel & Van Barneveld, 2009).

In Kenya, reforms within TVET have emphasized Competency-Based Education and Training (CBET), which seeks to develop graduates capable of demonstrating both occupational competence and workplace-related skills. CBET promotes learner-centred approaches that encourage practical application, inquiry, collaboration, and reflective learning. As a result, instructional strategies such as problem-based learning have become increasingly relevant in supporting competency development.

Despite these reforms, concerns remain regarding the preparedness of TVET graduates for employment. Employers continue to identify gaps in communication, teamwork, adaptability, critical thinking, and problem-solving among graduates. Previous studies in Kenya have examined issues such as CBET implementation, trainer preparedness, curriculum reforms, industrial attachment, and graduate employability. However, limited empirical attention has been directed towards examining problem-based learning as a specific instructional strategy for supporting soft skills acquisition among TVET trainees (Owuor et al., 2025; Mwaura et al., 2022; Mutembei et al., 2024).

Furthermore, existing studies often examine learner-centred approaches broadly without examining specific implementation dimensions of problem-based learning. Understanding aspects such as authentic problem exposure, inquiry practices, alternative solution development, collaborative reasoning, and evidence-based decision-making is important because these elements determine whether problem-based learning produces meaningful learning experiences (Hmelo-Silver, 2004).

Uasin Gishu County provides an important context for examining this relationship because it hosts several public TVET institutions that contribute to workforce development in sectors including construction, manufacturing, agriculture, hospitality, transport, and entrepreneurship. Although institutions within the county have adopted competency-based approaches, limited evidence exists regarding the contribution of problem-based learning to trainees' development of workplace-relevant soft skills.

Therefore, this study examined the relationship between problem-based learning implementation and soft skills acquisition among trainees in public TVET institutions in Uasin Gishu County, Kenya.

METHODOLOGY

2.1 Research Approach and Design

The study adopted a mixed-methods approach using a descriptive survey research design. The mixed-methods approach was appropriate because the study required both quantitative evidence regarding the relationship between problem-based learning and soft skills acquisition and qualitative explanations regarding the implementation experiences of trainers and institutional leaders (Kivunja & Kuyini, 2017).

The quantitative component enabled the researcher to examine the extent of problem-based learning implementation and its relationship with trainees' reported soft skills acquisition. The qualitative component

provided deeper insights into institutional practices, implementation challenges, and contextual factors influencing problem-based learning.

The descriptive survey design was appropriate because the study examined existing instructional practices without manipulating variables. Therefore, the findings were interpreted in terms of statistical relationships and associations rather than direct causal effects.

2.2 Study Area

The study was conducted in public Technical and Vocational Education and Training (TVET) institutions in Uasin Gishu County, Kenya.

The county was selected because it hosts public TVET institutions implementing competency-based training approaches and contributes to workforce development within the North Rift region. The institutions provide training in various occupational areas, making the county an appropriate setting for examining the relationship between instructional strategies and workplace competency development.

2.3 Target Population and Sampling Procedures

The target population consisted of 495 trainees, 71 trainers, and eight principals from public TVET institutions in Uasin Gishu County.

Trainees were included because they were direct participants in the learning process and could provide information regarding their experiences with problem-based learning activities and perceived soft skills development. Trainers were included because they were responsible for implementing instructional practices, while principals provided institutional perspectives regarding curriculum implementation, resources, and management support.

A sample consisting of 418 trainees, 71 trainers, and eight principals was selected using stratified, simple random, and purposive sampling techniques.

Stratified sampling was used to ensure representation across participating institutions. Simple random sampling was applied in selecting trainees and trainers, while principals were purposively selected due to their leadership positions and knowledge of institutional practices.

2.4 Research Instruments

Data were collected using structured questionnaires and semi-structured interview schedules.

Questionnaires were administered to trainees and trainers, while interview schedules were used to collect information from principals.

The instruments were developed based on:

- the study objectives;
- the theoretical framework;
- reviewed literature on problem-based learning;
- literature on soft skills development within educational and workplace contexts.

The use of multiple instruments enabled triangulation of findings by comparing the perspectives of trainees, trainers, and institutional leaders (Jalaluddin et al., 2025).

2.5 Measurement of Problem-Based Learning Implementation

Problem-based learning was operationalized as the extent to which trainees engaged in learning activities centred around authentic problems requiring investigation, collaboration, analysis, and development of solutions (Hmelo-Silver, 2004).

The construct was measured using indicators reflecting key characteristics of problem-based learning, including:

- exposure to authentic workplace problems;
- investigation of alternative solutions;
- inquiry and research activities;
- collaborative discussion;
- evaluation of alternative ideas;
- evidence-based decision-making;
- use of workplace scenarios;
- confidence in solving workplace challenges.

These indicators were selected because effective problem-based learning requires learners to actively analyse situations, gather information, consider alternatives, justify decisions, and reflect on outcomes (Hmelo-Silver, 2004).

Responses were collected using Likert-scale items, where higher scores represented stronger implementation of problem-based learning practices.

2.6 Measurement of Soft Skills Acquisition

Soft skills acquisition was measured as the extent to which trainees perceived that their learning experiences contributed to the development of transferable workplace competencies.

The study assessed soft skills dimensions including:

- communication skills;
- teamwork;
- critical thinking;
- problem-solving;
- decision-making;
- adaptability;
- workplace confidence.

These competencies were selected because they represent important skills required for successful participation in modern workplaces (Dominico, 2025; Bisschoff & Massyn, 2025).

Questionnaire items assessed trainees' perceptions regarding whether problem-based learning activities contributed to the development of these competencies.

Higher scores represented stronger perceived acquisition of soft skills.

2.7 Reliability of Research Instruments

The reliability of the research instruments was assessed through pilot testing before the main data collection exercise.

The pilot study was conducted to determine whether questionnaire items were clear, consistent, and suitable for measuring the intended constructs.

Internal consistency of questionnaire items was assessed using Cronbach's alpha coefficient. A value of 0.70 and above was considered an acceptable indicator of reliability (Saw et al., 2025).

The pilot testing process helped identify unclear items and improve the final instruments before administration.

Internal consistency of the questionnaire items was assessed using Cronbach's alpha. The questionnaire yielded a coefficient of 0.795**,** exceeding the threshold of 0.70 and indicating acceptable internal consistency.

2.8 Validity of Research Instruments

The validity of the research instruments was established through expert review and alignment with the study objectives.

Experts reviewed the instruments to determine whether questionnaire items adequately represented the concepts of problem-based learning implementation and soft skills acquisition.

Content validity was enhanced by ensuring that items reflected the theoretical dimensions and objectives of the study.

Construct validity was strengthened by ensuring that questionnaire items represented the major components of problem-based learning, including authentic problems, inquiry, collaboration, decision-making, and reflection (Hmelo-Silver, 2004).

2.9 Data Collection Procedures

Before data collection, the researcher obtained authorization from relevant authorities.

Respondents were informed about the purpose of the study, and participation was voluntary.

Ethical principles relating to informed consent, confidentiality, anonymity, and responsible management of information were observed throughout the research process.

Questionnaires were administered to trainees and trainers, while interviews were conducted with principals.

2.10 Data Analysis

Quantitative data were analysed using SPSS version 30.

Descriptive statistics, including frequencies and percentages, were used to summarize respondents' characteristics and responses regarding problem-based learning implementation and soft skills acquisition.

Inferential statistics included:

Chi-Square Test

A Chi-square test of independence was conducted to determine whether a statistically significant association existed between problem-based learning implementation and soft skills acquisition.

Regression Analysis

Regression analysis was conducted to examine whether problem-based learning significantly predicted soft skills acquisition.

The regression results were interpreted using:

- significance level;
- F-statistic;
- coefficient of determination (R^2).

Because the study adopted a descriptive survey design, regression results were interpreted as evidence of statistical association rather than proof of direct causation.

Qualitative Data Analysis

Interview data were analysed thematically.

Themes emerging from trainers' and principals' responses were integrated with quantitative findings to provide explanations regarding implementation challenges, institutional support, and factors influencing problem-based learning effectiveness.

RESULTS AND DISCUSSION

3.1 Implementation of Problem-Based Learning among TVET Trainees

The study examined the extent to which problem-based learning practices were implemented among trainees in public Technical and Vocational Education and Training institutions in Uasin Gishu County. The findings revealed that although problem-based learning was recognized as an important learner-centred instructional strategy, several essential elements required for effective implementation were inconsistently experienced by trainees.

A key finding was that trainees reported limited exposure to authentic workplace problems. Effective problem-based learning requires learners to engage with realistic challenges that reflect situations encountered in professional environments. Authentic problems encourage learners to apply technical knowledge, analyse situations, consider limitations, and develop practical solutions (Hmelo-Silver, 2004; Strobel & Van Barneveld, 2009).

The limited exposure to workplace-related problems suggests that some problem-based learning activities may remain classroom-focused rather than reflecting the complexity and uncertainty of actual occupational environments. In TVET settings, where graduates are expected to transition into employment, learning experiences should provide opportunities for trainees to practise solving realistic workplace challenges.

This finding demonstrates the difference between assigning problems and implementing problem-based learning. A learning activity becomes meaningful problem-based learning when trainees are required to investigate issues, analyse information, evaluate alternatives, collaborate with others, and justify decisions (Hmelo-Silver, 2004).

3.2 Investigation of Alternative Solutions and Critical Thinking Development

The study further examined whether trainees were provided with opportunities to investigate alternative solutions before making decisions.

The findings indicated limitations in this aspect of problem-based learning implementation. Effective problem-based learning requires learners to explore multiple possible responses, compare alternatives, evaluate evidence, and justify selected solutions (Hmelo-Silver, 2004).

The limited opportunity to investigate alternatives may reduce the development of higher-order thinking skills. Critical thinking develops when learners are encouraged to question assumptions, examine different perspectives, and make reasoned judgments rather than simply identify expected answers (Hmelo-Silver, 2004).

Therefore, trainers should design problem-based learning activities that encourage trainees to:

- identify different possible solutions;
- evaluate strengths and weaknesses of alternatives;
- use evidence to support decisions;
- reflect on outcomes.

Such practices can strengthen analytical reasoning and professional judgement.

3.3 Inquiry, Research, and Evidence-Based Decision-Making

The findings revealed weaknesses in inquiry and research practices within problem-based learning activities.

Inquiry is a fundamental component of problem-based learning because learners are expected to identify information gaps, search for relevant information, evaluate evidence, and apply findings when developing solutions (Hmelo-Silver, 2004).

Where inquiry opportunities are limited, trainees may become dependent on trainers for information rather than developing independent learning skills (Hmelo-Silver, 2004).

Similarly, evidence-based decision-making was identified as an area requiring strengthening. Workplace environments require employees to make decisions based on technical knowledge, available information, professional standards, and practical evidence.

Therefore, TVET institutions should strengthen activities that require trainees to investigate problems, gather information, analyse evidence, and justify their decisions.

3.4 Collaboration and Discussion of Alternative Ideas

Problem-based learning is expected to promote collaboration because learners often work together to analyse problems and develop solutions (Vygotsky, 1978; Hmelo-Silver, 2004).

The findings showed that although collaborative activities existed, opportunities for deeper discussion and evaluation of alternative ideas were limited.

Effective collaboration involves more than placing learners into groups. Meaningful collaborative learning requires:

- exchange of ideas;

- questioning of assumptions;
- negotiation of solutions;
- shared decision-making;
- reflection on group outcomes.

Where group activities focus mainly on completing assigned tasks, opportunities to develop communication, teamwork, and interpersonal skills may be reduced (Hmelo-Silver, 2004).

Trainers should therefore structure collaborative activities that encourage active participation, discussion, and collective reasoning.

3.5 Relationship Between Problem-Based Learning and Soft Skills Acquisition

The study examined whether problem-based learning implementation was associated with soft skills acquisition among TVET trainees.

The Chi-square test revealed a statistically significant association between problem-based learning and soft skills acquisition:

$\chi^2(4, N = 418) = 22.315, p < .001.$

This finding indicates that differences in trainees' experiences of problem-based learning were associated with differences in reported levels of soft skills acquisition.

Regression analysis further showed a statistically significant relationship between problem-based learning and soft skills acquisition:

$F(1,418) = 6.381, p = .012.$

The finding suggests that problem-based learning contributes positively to workplace-related competencies such as communication, teamwork, critical thinking, problem-solving, and decision-making. However, interpretation of this finding requires caution. The regression model produced an R^2 value of:

0.009 (0.9%).

This means that problem-based learning explained only a small proportion of the variation in trainees' reported soft skills acquisition. The finding does not suggest that problem-based learning lacks educational value. Rather, it indicates that soft skills development is influenced by multiple factors beyond a single instructional strategy.

3.6 Interpretation of the Low Explanatory Power of Problem-Based Learning

The low explanatory power of the regression model suggests that other factors contribute significantly to the development of soft skills among TVET trainees.

Soft skills acquisition is a multidimensional process influenced by factors such as:

- trainer competence;
- institutional learning environment;
- availability of resources;
- learner motivation;

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume XI Issue X October 2026

- previous educational experiences;
- industrial exposure;
- assessment practices;
- industry partnerships.

Therefore, while problem-based learning creates opportunities for trainees to practise workplace-related competencies, the extent to which these opportunities translate into measurable skills depends on the quality of implementation and the broader educational context (Owuor et al., 2025; Mutembei et al., 2024).

The findings suggest that strengthening soft skills development requires a comprehensive approach that combines effective instructional strategies with supportive institutional systems (Owuor et al., 2025; Mwaura et al., 2022).

3.7 Institutional and Trainer Factors Influencing Implementation

Qualitative findings from trainers and principals provided additional explanations regarding problem-based learning implementation.

Trainers recognized that problem-based learning could support:

- practical reasoning;
- teamwork;
- problem-solving;
- learner confidence;
- workplace preparation.

However, they also identified challenges affecting effective implementation, including:

- inadequate learning resources;
- large trainee numbers;
- limited instructional time;
- differences in learner preparedness;
- challenges facilitating independent learning.

Institutional leaders similarly acknowledged the importance of learner-centred approaches but emphasized the need for stronger institutional support.

These findings demonstrate that the success of problem-based learning depends not only on the instructional approach but also on the environment in which it is implemented (Owuor et al., 2025).

3.8 Differences Between Trainee and Trainer Perspectives

An important observation from the study was the difference between trainee experiences and trainer/institutional perceptions.

Trainers and principals generally viewed problem-based learning positively and emphasized its potential contribution to workplace competencies. However, trainees identified weaknesses in some practical aspects of implementation.

This difference may represent an implementation perception gap.

Institutional stakeholders may evaluate problem-based learning based on curriculum objectives and intended practices, whereas trainees evaluate it based on their actual learning experiences.

Therefore, evaluating instructional strategies requires consideration of multiple perspectives to identify gaps between planned implementation and actual classroom experiences.

3.9 Study Limitations

The study relied largely on self-reported responses from trainees and trainers. Although such responses provide valuable insights into learning experiences, they may be influenced by individual perceptions, response bias, or social desirability.

Additionally, the study was conducted within TVET institutions in one county, which may limit generalization of findings to other geographical contexts.

Future research should incorporate:

- longitudinal research designs;
- experimental approaches;
- employer evaluations;
- workplace observations;
- practical competency assessments.

These approaches would provide stronger evidence regarding the relationship between problem-based learning and workplace skill development.

CONCLUSION

This study examined the relationship between problem-based learning implementation and soft skills acquisition among trainees in public Technical and Vocational Education and Training institutions in Uasin Gishu County, Kenya.

The findings demonstrated that problem-based learning was significantly associated with trainees' reported acquisition of soft skills. The Chi-square analysis established a statistically significant association between problem-based learning practices and soft skills acquisition, while regression analysis showed a statistically significant relationship between problem-based learning and soft skills outcomes.

However, the findings also demonstrated that the contribution of problem-based learning should be interpreted cautiously. Although the relationship was statistically significant, the regression model explained only a small proportion of the variation in soft skills acquisition. This indicates that soft skills development is a complex process influenced by multiple factors beyond instructional strategy alone.

The study established that effective problem-based learning depends substantially on implementation quality. While problem-based learning provides opportunities for trainees to develop communication, teamwork, critical thinking, problem-solving, and decision-making skills, these outcomes are more likely to occur when learners

are exposed to authentic workplace problems, inquiry activities, alternative solution development, evidence-based reasoning, collaboration, and reflection.

The study further revealed that institutional conditions, trainer competence, learner participation, and available resources influence the extent to which problem-based learning contributes to soft skills development. Therefore, problem-based learning should be viewed as an important component of competency development rather than a single solution for producing workplace-ready graduates.

Overall, the study concludes that problem-based learning has potential to support soft skills acquisition among TVET trainees when implemented effectively. Strengthening instructional practices, trainer capacity, institutional support, and industry relevance is necessary to maximize its contribution to graduate employability.

RECOMMENDATIONS

5.1 Strengthening Authentic Problem-Based Learning Experiences

TVET institutions should strengthen the authenticity of problem-based learning activities by ensuring that problems presented to trainees reflect realistic workplace situations. Learning activities should require trainees to:

- analyse practical challenges;
- investigate possible solutions;
- evaluate alternatives;
- apply technical knowledge;
- justify decisions.

Industry stakeholders should be involved in identifying workplace-related problems to ensure that learning experiences remain relevant to occupational demands.

5.2 Enhancing Trainer Capacity

The effectiveness of problem-based learning depends greatly on trainers' ability to facilitate inquiry-based and collaborative learning. TVET institutions should provide continuous professional development focusing on:

- designing authentic workplace problems;
- facilitating learner inquiry;
- guiding collaborative discussions;
- supporting independent learning;
- assessing soft skills development.

Trainers should increasingly act as facilitators who guide learners through problem analysis and solution development rather than simply providing answers.

5.3 Promoting Inquiry and Evidence-Based Decision-Making

Institutions should strengthen learning activities that require trainees to:

- investigate problems;

- gather relevant information;
- evaluate evidence;
- compare alternative solutions;
- justify decisions.

Such practices will strengthen critical thinking, analytical reasoning, and professional judgement.

5.4 Improving Collaborative Learning Practices

TVET institutions should structure group activities to ensure meaningful participation among all trainees.

Effective collaborative learning should include:

- clearly defined responsibilities;
- active discussion;
- evaluation of different ideas;
- shared decision-making;
- reflection on outcomes.

This will enable collaboration activities to contribute effectively to communication and teamwork development.

5.5 Strengthening Institutional Support Systems

Institutional managers and policymakers should address factors affecting effective problem-based learning implementation, including:

- inadequate learning resources;
- limited practical facilities;
- large class sizes;
- trainer workload;
- weak industry partnerships.

Adequate institutional support is essential for translating problem-based learning principles into effective classroom practice.

Future Research Directions

Future studies should investigate additional factors influencing soft skills acquisition among TVET trainees.

Areas requiring further investigation include:

- trainer competence;
- institutional learning environments;
- learner motivation;

- assessment approaches;
- industrial attachment experiences;
- employer involvement.

Future research should also consider longitudinal and experimental designs to establish stronger evidence regarding how sustained exposure to problem-based learning influences workplace competencies over time.

Researchers should incorporate multiple approaches for assessing soft skills, including:

- employer evaluations;
- workplace observations;
- practical competency assessments;
- graduate follow-up studies.

Such approaches would complement self-reported measures and provide a more comprehensive understanding of how instructional strategies contribute to workplace readiness.

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