COMPETENCY-BASED LEARNING AND ENTREPRENEURIAL INTENTION IN UNIVERSITY TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING INSTITUTIONS IN KENYA

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ABSTRACT

The purpose of this study was to examine the effect of competency-based learning on entrepreneurial intention in university technical and vocational education and training institutions in Kenya. Specifically, the study examined the effect of problem-based learning and project-based learning on entrepreneurial intention in university technical and vocational education and training institutions in Kenya. The theoretical framework of the study was grounded on the theory of planned behavior. Drawing on the positivist research philosophy, the study utilized the quantitative non-experimental research methodology. The study employed the correlational, cross-sectional survey research design to test non-causal relationships between the study variables. The proportionate stratified random sampling technique was utilized to select a sample size of 394 students from a target population of 24680 students in university technical and vocational education and training institutions in Kenya. A structured self-administered survey questionnaire was used as the means of collecting primary data. The study utilized a cross-sectional survey-based approach to collect data. The collected data was processed and entered into the statistical package for social sciences (SPSS) version 26 to create a data sheet used for analysis. Data was analyzed using descriptive statistics and inferential statistics. The Pearson's product moment correlation results indicated that problem-based learning and project-based learning had positive and significant relationship with entrepreneurial intention in university technical and vocational education and training institutions in Kenya. A standard multiple linear analyses was conducted with entrepreneurial intention as the dependent variable and problem-based learning and project-based learning as predictor variables. The regression results indicated that problem-based learning and project-based learning had positive and significant effect on entrepreneurial intention in university technical and vocational education and training institutions in Kenya. The study recommends that it is imperative for the management to implement competency-based learning to foster entrepreneurial intention in technical and vocational education and training institutions. The policy makers should consider initiating policy review to encourage the management to implement competency-based learning to foster entrepreneurial intention in technical and vocational education and training institutions. The study points to several intriguing paths for future research. Future researchers should examine the mediating effect of entrepreneurial competencies on the relationship between competency-based learning and entrepreneurial intention in other sectors or contexts.

***Key Words:** Competency-Based Learning, Entrepreneurial Intention, University Technical and Vocational Education and Training Institutions, Kenya*

INTRODUCTION

Over the past decade, entrepreneurial intention has attained prominence in the theory of planned behavior. Entrepreneurial intention is considered to be the best predictor of entrepreneurial behavior to support entrepreneurship which is considered a fundamental element of modern economy due to its contribution to economic growth and employment creation (Romero-Galisteo *et al.*, 2022). Recognizing its pivotal role, entrepreneurial intention has been identified to serve as a key catalyst behind the introduction of new technologies in associating existing resources with innovative concepts to develop and commercialize new products or services, triggering business entry into niche markets and obtain a competitive advantage (Suratno, Kuswanto, Yantoro, & Arief, 2024). Entrepreneurial intention is a resilient sign of entrepreneurial potential which highlights the individual's self-approval belief toward setting up a new venture in the future (Baggen, Lans, & Gulikers, 2022). However, the entrepreneurial intention of university students has steadily increased, but has not yet reached the levels desirable to solve the problem of youth unemployment (Lv *et al.*, 2021). While there is a consensus that entrepreneurial intention is a personal orientation which might lead to venture creations, measuring this question remains a challenge (Alkaabi & Senghore, 2024). Many people with entrepreneurial knowledge remain unemployed and poor (Dahiru, Bappayaya, & Musa, 2023).

In a world that is preoccupied with economic development, entrepreneurial intention has proved to be an imperative and ongoing construct in entrepreneurship theory and research (Kosgei, Korir, & Saina, 2021). It is undeniable that the entrepreneurial intention is a necessary condition for the development of entrepreneurship which is widely argued to be critical for alleviating poverty and unemployment (Botha & Taljaard, 2021). In entrepreneurship theory and research, entrepreneurial intention has shown to be a critical and continuous phenomenon (Kosgei, 2022). Due to the increasing unemployment rates, the need for educated persons to start new businesses is necessary (Kubai, 2023). Developing critical thinking, creativity, and practical skills is the main goal of the government's learner-centered competency-based curriculum, which was unveiled in 2017 (Nzoka, 2024). However, every year more entrepreneurial literate students are graduating from tertiary institutions, but on the other side, the rate of unemployment is increasing disproportionally (Baggen *et al.*, 2022). High graduate unemployment, especially on the African continent, has been described as a potential social problem, with the risk of this resulting in crime (Kibona, 2024).

The competency-based learning represents a fundamental shift in educational philosophy. The competency-based learning is an educational paradigm that focuses on mastering a number of clearly defined and measurable competencies (Kinnear *et al.*, 2023). The competency-based learning is an innovative educational approach where students advance in their studies based on their demonstrated mastery of specific skills or competencies, as opposed to the traditional grading system or the amount of time spent in a classroom (Molina-García, González-Serrano, Ordiñana-Bellver, & Baena-Morales, 2024; Kubai, 2023). The student-centered learning approach encompasses problem-based learning, project-based learning, and case-based learning (Wijnia, Noordzij, Arends, Rikers, & Loyens, 2024). The competency-based learning allows educators to provide more focused and constructive feedback, which is based on specific achievements against set competencies (Kiesler & Impagliazzo, 2023). The competency-based learning is gaining prominence in education as it aligns with the evolving demands of the modern workforce (Leles, Zaina, & Cardoso, 2024). However, there are several challenges facing the effective implementation of competency-based curriculum and competency-based assessment in Kenya (Kubai, 2023; Muchira, Morris, Wawire, & Oh, 2023).

The competency-based learning is gaining prominence in education as employers increasingly value practical skills and competencies over traditional academic credentials (Waladi & Lamarti, 2024). In the sub-Sahara Africa, investment in youth through effective capacity development, involving adoption of contemporary skills development approaches, is integral in alleviating the region's high youth unemployment rates as it will equip the youth with skills needed for employment (Ochieng & Ngware, 2022). With increasing competition

in the labor market, employers want candidates who are not only intellectually savvy, but can also immediately contribute and integrate into the existing work system (Mursalin, Pramesworo, & Arbie, 2024). The competency-based learning enables students to advance when they have effectively mastered a competency, regardless of how much or how little time it takes (Molina-García *et al.*, 2024). In the competency-based learning approach, students are encouraged to progress at their own pace, allowing them to take the time needed to thoroughly grasp each competency (Leles, Zaina, & Cardoso, 2024). The competency-based learning approach ensures that students are not rushed through material or held back due to rigid grade-level structures (Impagliazzo & Xu, 2024). The competency-based learning equips students with the skills and knowledge they need to succeed in real-world scenarios (Ma, 2024; Waladi & Lamarti, 2024).

In the face of dynamic and competitive labor market demands, education that is oriented towards practical learning outcomes is an inevitable necessity (Molina-García *et al.*, 2024). The introduction of the competency-based curriculum in Kenya by the government was seen as a positive innovation and a paradigm shift from the examination-oriented curriculum of 8-4-4 to the assessment of learners' competencies through competency-based assessment (Kubai, 2023). With the aim of improving the entrepreneurial intention in countries with entrepreneurial rates which are lower than the average, there is a growing interest in developing education programs to encourage and enhance entrepreneurship (Barba-Sánchez, Mitre-Aranda, & del Brío-González, 2022). However, despite training youths in institutions of higher learning with the aim of venturing into self-employment, a large number continue to seek paid employment, with many of them remaining unemployed with low entrepreneurial intentions (Kosgei, Korir, & Saina, 2022). The unemployment situation has been blamed on persistent lack of systematic and appropriate manpower planning and the educational systems incapability to impact in its products, the appropriate skills and competencies needed for employment reality in the society (Tokunbo, Osunloye, & Okunla, 2024).

By bridging the gap between educational outcomes and market demands, universities strive to improve employability for their graduates by embedding key competences, which include entrepreneurial skills in higher education curricula (Alkaabi & Senghore, 2024). However, notwithstanding the concerted interventions for integrating entrepreneurship education in higher learning institutions, graduates' transition from universities to entrepreneurial activities remains insignificant (Ilomo & Mwantimwa, 2023). With the growing number of university students and graduates, access to employment is still limited (Kibona, 2024). The situation has been attributed to a mismatch between delivered skills from training institutions and the skills demanded in the labor market, due to limited input from industry players into curriculum design, development and implementation in universities, TVET institutions and middle level colleges (Sitati, Githaiga, & Siagi, 2024). In Kenya, a large number of youths graduating from the formal education system are unemployed despite the fact that opportunities for high technology skilled workforce exist (Ochieng & Ngware, 2022). The youth unemployment is high partly due to mismatch between education system and skills that are required by the job market (Farzanegan & Gholipour, 2021).

In order to respond to the concerns and needs of both students and the job market, knowing the entrepreneurial intention of the students will help to guide and promote effective university policies to support entrepreneurship (Romero-Galisteo *et al.*, 2022). Understanding the factors influencing entrepreneurial intention among university students in emerging countries is pivotal (Nguyen & Nguyen, 2024). Many researchers have studied factors influencing students' entrepreneurial intentions (Alkaabi & Senghore, 2024; Martins, Shahzad, & Xu, 2023; Satriadi, Almaududi Ausat, Heryadi, Widjaja, & Sari, 2022). However, most of the studies are conducted in developed countries (Dahiru *et al.*, 2023). Despite this growing curiosity, there is still a scarcity of information on entrepreneurial intentions in different contexts (Yasir, Mahmood, Mehmood, Rashid, & Liren, 2021). A comprehensive examination of the influence of competency-based learning on the entrepreneurial intentions of students is currently lacking, particularly in the Kenyan context.

Statement of the Problem

Despite the efforts to spur economic growth and overcome unemployment, the entrepreneurial intention of college students remains relatively low (Yang, 2024). With the aim of improving the entrepreneurial intention in countries with entrepreneurial rates which are lower than the average, there is a growing interest in developing education programs to encourage and enhance entrepreneurship (Barba-Sánchez, Mitre-Aranda, & del Brío-González, 2022). Entrepreneurial intention has been identified to serve as a key catalyst behind the introduction of new technologies in associating existing resources with innovative concepts to develop and commercialize new products or services, triggering business entry into niche markets and obtain a competitive advantage (Suratno, Kuswanto, Yantoro, & Arief, 2024). It is undeniable that the entrepreneurial intention is a necessary condition for the development of entrepreneurship which is widely argued to be critical for alleviating poverty and unemployment (Botha & Taljaard, 2021). However, while the entrepreneurial intention of university students has steadily increased, it has not yet reached the levels desirable to solve the problem of youth unemployment (Lv *et al.*, 2021). Although there is a consensus that entrepreneurial intention is a personal orientation which might lead to venture creations, measuring this question remains a challenge (Martins, Shahzad, & Xu, 2023).

A vast body of research has noted that entrepreneurial intention could play a significant role in the decision of whether to start a new venture (Hou, Su, Qi, Chen, & Tang, 2022). In recent years, researchers have shown that entrepreneurial intention is a reliable predictor of entrepreneurial behavior (Akter & Iqbal, 2022; Cui & Bell, 2022; Duong *et al.*, 2022). However, expansion of employment opportunities has not kept pace with the rapidly expanding working age population (Onsomu, Munga, Nyabaro, & Munene, 2022). The formal sector has not met the challenges of employment creation (Kerubo, 2023). Globally, unemployment among university graduates is one of the longstanding challenges facing many governments (Tošović-Stevanović & Stakić, 2024). In most developing countries, employment opportunities are limited to suffice the massive number of university graduates who are seeking formal employment (Aikael *et al.*, 2021; Maslakci, Sürücü, & Şeşen, 2024). Most developing countries are locked into unsustainable job creation (Mwantimwa *et al.*, 2022; Kibona, 2024). In East Africa, poverty and unemployment persist as major problems facing the young people, hindering their empowerment and growth (Magambo, Nyamwesa, Mgulunde, & Magasi, 2024). In Kenya, the youth represent 43% of the working age population and constitute 70% of total unemployment (Lando, 2023). The youths constitute the highest percentage of the unemployed and under employed population in Kenya (Lux, 2023).

Despite various policy interventions and relatively strong economic growth in the region since the early 2000s, youth unemployment and underemployment remain significant obstacles to development (Onsomu *et al.*, 2022). In Kenya, the number of graduates who have not been employed, as well as the ones who are outside the labor force, is relatively high (Magambo *et al.*, 2024). Universities aim to stimulate student employability as one of their primary objectives (Molina-García *et al.*, 2024). However, a negative and significant effect of higher quality of education system on youth unemployment rate and the high records of youth unemployment have increased the risk of political instability and other social concerns (Farzanegan & Gholipour, 2021). The unemployment situation has been blamed on persistent lack of systematic and appropriate manpower planning and the educational systems incapability to impact in its products, the appropriate skills and competencies needed for employment reality in the society (Tokunbo, Osunloye, & Okunla, 2024).

By bridging the gap between educational outcomes and market demands, universities strive to improve employability for their graduates by embedding key competences, which include entrepreneurial skills in higher education curricula (Alkaabi & Senghore, 2024). However, high rates of unemployment and lack of saleable skills among graduates of both public and private tertiary institutions are contributing immensely to

the issues of insecurity in most parts of the country (Tokunbo, Osunloye, & Okunla, 2024). The youth unemployment is high partly due to mismatch between education system and skills that are required by the job market (Farzanegan & Gholipour, 2021; Weaich, Weaich, Simbanegavi, & Ndlovu, 2024). The effectiveness of the entrepreneurship education curricula offered in TVET colleges in promoting entrepreneurial competencies remains uncertain (Hou, Su, Qi, Chen, & Tang, 2022). While several studies suggest that entrepreneurial education has a significantly positive effect on entrepreneurial intention (Xu, Fu, & Zhang, 2023), the relationship between competency-based learning and entrepreneurial intention has not achieved an agreement yet.

Research Objectives

The general objective of this study was to examine the effect of competency-based learning on entrepreneurial intention in university technical and vocational education and training institutions in Kenya. The study was guided by the following specific objectives;

- To determine the influence of problem-based learning on entrepreneurial intention in university technical and vocational education and training institutions in Kenya.
- To assess the influence of project-based learning on entrepreneurial intention in university technical and vocational education and training institutions in Kenya.

In this study, two null hypotheses were tested.

- H_01: Problem-based learning has no significant effect on entrepreneurial intention in university technical and vocational education and training institutions in Kenya.
- H_02: Project-based learning has no significant effect on entrepreneurial intention in university technical and vocational education and training institutions in Kenya.

LITERATURE REVIEW

Theoretical Framework

The theoretical framework was anchored on the theory of planned behavior.

Theory of Planned Behavior

The theory of planned behavior (Ajzen, 1991; Ajzen, 2005) is an extension of the theory of reasoned action, the theory of planned behavior is a decision-making framework commonly used to understand people's attitudes and behavioral intentions (Ncube & Matlala, 2024). The theory of planned behavior (Ajzen, 2002; Fishbein & Ajzen, 2011) posits that attitude towards behavior, subjective norms and perceived behavioral control influences entrepreneurial intention which in turn predicts entrepreneurship behavior (Zulkifle & Aziz, 2023). Entrepreneurial intention may be evaluated via theory of planned behavior as entrepreneurial activity is considered to be an intentionally planned behavior (Prayoga, Susilaningsih, & Indriayu, 2024). Academic scholars have tested students' entrepreneurial intention through the theory of planned behavior and social cognitive theory (Hou *et al.*, 2022; Maheshwari & Kha, 2022). However, the link between entrepreneurial intention and career is missing in previous studies (Murad *et al.*, 2024). The theory of planned behavior is a theory that explains the psychological determinants of decision-making, which posits that people make reasoned decisions to engage in a specific behavior (Carfora, Cavallo, Catellani, Del Giudice, & Cicia, 2021; Wang, Zhang, & Wong, 2024).

The theory of planned behavior is a relevant theoretical framework that explains the effect of competency-based learning on entrepreneurial intention in university technical and vocational education and training institutions in Kenya. The theory of planned behavior posits that attitude towards behavior, subjective norms and perceived behavioral control influences entrepreneurial intention which in turn predicts entrepreneurship behavior (Maheshwari & Kha, 2022; Zulkifle & Aziz, 2023). There are numerous studies which adopted the theory of planned behavior for researching entrepreneurial intention (Ilomo & Mwantimwa, 2023). Grounded

in theory of planned behavior, Amini Sedeh, Abootorabi, and Zhang (2021) explored how national social capital, as an important but untested element of institutional environment, influences the effect of perceived entrepreneurial ability on entrepreneurial intentions. The theory of planned behavior posits that the more positively an individual perceives a certain practical behavior, the stronger their intention to engage in that behavior (Ncube & Matlala, 2024).

The theory of planned behavior is an extended form of theory of reasoned action, with the addition of a new variable, perceived behavioral control (Yasir *et al.*, 2021; Zulkifle & Aziz, 2023). The theory of planned behavior started as the theory of reasoned action in 1980 to predict an individual's intention to engage in a behavior at a specific time and place (Prayoga *et al.*, 2024). The theory of planned behavior was intended to explain all behaviors over which people have the ability to exert self-control (Maheshwari & Kha, 2022). The theory of reasoned action, which is a widely used intention-based theory, explains intention via a formulation considering subjective norms of significant others and personal attitude towards the related behavior as the antecedents of intention (Ncube & Matlala, 2024).
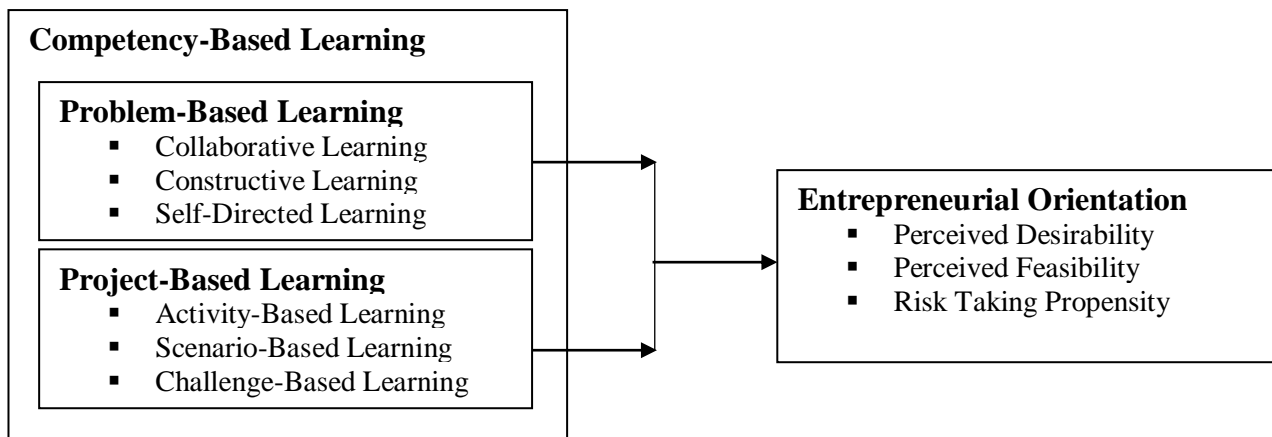
The theory of planned behavior suggests that behavioral intent and behavioral intentions are influenced by the attitude about the likelihood that the behavior will have the expected outcome and the subjective evaluation of the risks and benefits of that outcome (Maheshwari & Kha, 2022; Prayoga *et al.*, 2024). The theory of planned behavior is an extensively adapted model in many different research areas. It predicts and explains behavior in specific contexts (Zulkifle & Aziz, 2023). The theory of planned behavior is a frequently used theory in different disciplines as to become an entrepreneur is considered to be a conscious activity and intention is taken to be a cognitive state (Ncube & Matlala, 2024). The theory of planned behavior posits that entrepreneurial decision is a complex one and need intentional cognitive process (Romero-Colmenares & Reyes-Rodríguez, 2022; Yasir *et al.*, 2021).

The theory of planned behavior is used extensively within different study areas besides the entrepreneurship literature, and it still provides a rich potential for the area (Maheshwari & Kha, 2022). However, there are several limitations of the theory of planned behavior. One of key criticisms of the theory of planned behavior is that it assumes the person has acquired the opportunities and resources to be successful in performing the desired behavior, regardless of the intention (Costa, 2024; Romero-Colmenares & Reyes-Rodríguez, 2022). Another criticism of the theory of planned behavior is that the time frame between intent and behavioral action is not addressed by the theory (Wang *et al.*, 2024). The theory of planned behavior is a self-interest-based explanation of consumers' choices, with a notable criticism related to the omission of a moral effect consideration (Carfora *et al.*, 2021).

While the added construct of perceived behavioral control was an important addition to the theory, the theory of planned behavior does not say anything about actual control over behavior (Prayoga *et al.*, 2024). The critics opine that the theory of planned behavior does not account for other variables that factor into behavioral intention and motivation, such as fear, threat, mood, or past experience (Ncube & Matlala, 2024). While the theory of planned behavior does consider normative influences, it still does not take into account environmental or economic factors that may influence a person's intention to perform a behavior (Carfora *et al.*, 2021). The other criticism of the theory of planned behavior is that it assumes that behavior is the result of a linear decision-making process, and does not consider that it can change over time (Zulkifle & Aziz, 2023).

Conceptual Framework
A conceptual framework is a graphical representation of the theorized interrelationships of the variables of a study (Topal, Hunt, & Rogers, 2021). The conceptual framework suggests that entrepreneurial intention is conceptualized as the dependent variable. However, problem-based learning and project-based learning are conceptualized as the independent variables. Figure 1 presented the conceptual framework.

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┌─────────────────────────────────────────────┐
│ Competency-Based Learning                    │
│                                              │
│ ┌───────────────────────────────────┐        │
│ │ Problem-Based Learning            │        │
│ │   ▪ Collaborative Learning        │─────┐  │
│ │   ▪ Constructive Learning         │     │  │
│ │   ▪ Self-Directed Learning        │     │  │
│ └───────────────────────────────────┘     │  │
│ ┌───────────────────────────────────┐     │  │
│ │ Project-Based Learning            │     │  │
│ │   ▪ Activity-Based Learning       │─────┘  │
│ │   ▪ Scenario-Based Learning       │        │
│ │   ▪ Challenge-Based Learning      │        │
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┌──────────────────────────────────┐
│ Entrepreneurial Orientation   │
│   ▪ Perceived Desirability   │
│   ▪ Perceived Feasibility   │
│   ▪ Risk Taking Propensity   │
└──────────────────────────────────┘

Independent Variables   **Dependent Variable**

Figure 1: Conceptual Framework

Review of Literature on Study Variables

This section presents a review of literature on the study variables.

Problem-Based Learning

The problem-based learning is centered on the learning that emanates from a real problem. The problem-based learning is a learning model that involves students in solving problems related to the real world (Susanti, Nurparidah, & Mandiri, 2024). The problem-based learning is a learning approach in which students learn about a subject by working in groups to solve an open-ended problem (Coumans & Wark, 2024). The problem-based learning is considered a part of active methodologies as it focuses on student activity, where students construct their own learning through interaction with the environment in which they are situated (Riyanto, Asbari, & Latif, 2024). The project-based learning is a teaching method in which students gain knowledge and skills by working for an extended period of time to investigate and respond to an authentic, engaging, and complex question, problem, or challenge (Ge, Leng, & Nizam Shaharom, 2022).

The problem-based learning is grounded in the resolution of problematic situations through which students significantly develop their cognitive structures, promote cooperative work, acquire skills for autonomous learning, and cultivate values such as responsibility, cooperation, and a commitment to truth (Gonzalez-Argote & Castillo-González, 2024). The problem-based learning process does not focus on problem solving with a defined solution, but it allows for the development of other desirable skills and attributes (Coumans & Wark, 2024). In the problem-based learning approach, the problem is what drives the motivation and the learning (Susanti, *et al.*, 2024). By implementing problem-based learning, critical thinking skills can develop, because the critical thinking skills observed in this research are the ability to identify, analyze, solve problems, think logically, make appropriate decisions, not be easily manipulated and draw conclusions, and not be easily deceived (Riyanto *et al.*, 2024).

The problem-based learning approach compels students to develop critical thinking skills. Using the problem-based learning as a didactic strategy enables students to integrate conceptual, procedural, attitudinal, and ethical knowledge, while engaging in cooperative and collaborative learning (Gonzalez-Argote & Castillo-González, 2024). The problem-based learning is centered around problem-solving in small groups utilizing knowledge as a tool, where learning is self-directed, and the teacher assumes a more passive and moderated role (Riyanto *et al.*, 2024). The problem-based learning model influences learning outcomes (Alfansuri, Handayani, & Rahma, 2024). Existent literature posits that one of the efforts to improve student learning outcomes is the problem-based learning method (Sutarjo, Emiliana, & Mones, 2023).

The problem-based learning is an instructional method where student learning occurs in the context of solving an authentic problem (Marra, Jonassen, Palmer, & Luft, 2024). The problem-based learning exerts a positive impact on student learning as it fosters the development of clinical competencies, academic engagement, self-directed, meaningful, and active learning, as well as academic performance, motivation, and participation, providing satisfaction and well-being to the student (Gonzalez-Argote & Castillo-González, 2024). The problem-based learning stimulates critical thinking, facilitates student-student interaction, and diminishes the prevalence of burnout and stress (Riyanto *et al.*, 2024). Ultimately, the problem-based learning develops metacognition (Sutarjo, Emiliana, & Mones, 2023).

Project-Based Learning

The project-based learning is an instructional method where student learning occurs in the context of solving an authentic problem (Carlson, 2023). The project-based learning is a teaching method that uses real-world and personally meaningful projects to engage students in learning (Basu Thakur, 2021; Gunarathna *et al.*, 2024). The project-based learning is an instructional approach built upon learning activities and real tasks that have brought challenges for students to solve (Wobbe & Stoddard, 2023). The project-based learning is a teaching method with a track record of preparing students for post-secondary education (McCann, 2022). The project-based learning is helpful for all students to understand difficult concepts in the classroom, and to deepen their understanding through authentic, hands-on projects (Rohmah, 2022).

The project-based learning is a generally done by groups of students working together toward a common goal (Wobbe & Stoddard, 2023). It teaches students not just content, but also important skills in ways students have to be able to function like adults in our society (Basu Thakur, 2021). The project-based learning skills include communication and presentation skills, organization and time management skills, research and inquiry skills, self-assessment and reflection skills, group participation and leadership skills, and critical thinking (Cruse, 2023). The project-based learning allows students to reflect upon their own ideas and opinions, and make decisions that affect project outcomes and the learning process in general (McCann, 2022). The project-based learning approach creates a constructivist learning environment in which students construct their own knowledge (Rohmah, 2022). The project-based learning could help students build good habits for their future in a hands-on way (Carlson, 2023).

Entrepreneurial Intention

Entrepreneurial intention refers to an individual's deliberate decision and plan to engage in entrepreneurial activities in the future (Wasim *et al.*, 2024). The entrepreneurial intentions are individual's willingness to learn about entrepreneurial activity or become self-employed (Kosgei, 2022). Entrepreneurial intention recognized as the decision to, and subsequent practice of, launching a business, is often referred to as a planned, considered act (Sharpe, 2023). It refers to the proclaimed conviction of an individual to undertake an entrepreneurial activity (Karan, Singh, & Rana, 2024). Entrepreneurial intention refers to an individual's beliefs and plans to start a business shortly and create new and competitive innovations (Cekule *et al.*, 2023). The entrepreneurial intentions are also considered as personal orientations which might lead to venture creations (Chiha, Nassar, Abdelbary, & Ragab, 2023).

Entrepreneurial intention refers to an individual's objective to start a high-growth business and work as an entrepreneur in the future (Baena-Luna, Sánchez-Torné, García-Río, & Pérez-Suárez, 2024). The eentrepreneurial intention is considered to be the best predictor of this behavior in comparison with other factors such as, demographic and trait variables (Sharpe, 2023). Within this perspective, entrepreneurial intention is explained by three antecedents: attitude towards entrepreneurial behavior, perceived social norms and perceived behavior control in other words, self-efficacy (Amin, Pratikto, & Wardana, 2024).

Entrepreneurial intention is a crucial precursor to someone's entrepreneurial endeavor in relation to the be new business and the performance that follows (Chiha *et al.*, 2023). The entrepreneurial process is broken down into stages, with the first stage, the entrepreneurial intention, serving as the main understanding

component (Sharpe, 2023). Existent literature posits that entrepreneurial intention acts as a key factor in the venture creation process (Amin *et al.*, 2024). However, only a few individuals are able to transform these intentions into actual behavior (Hassan, Anwar, Saleem, Alalyani, & Saleem, 2022). Therefore, there is a growing need to understand the factors that lead to entrepreneurial intentions and the potential of these factors in transforming intentions into behavior.

This research aimed to figure out the factors of entrepreneurial intention among senior high school students in various public secondary schools in Tugbok District, Davao City. The non-experimental quantitative research design adopting exploratory factor analysis was used. Three hundred ninety-one respondents were chosen from various public secondary schools through the stratified, random technique. An online instrument using google forms was used to gather the data. Data reduction analysis reduced the multi-dimensionality set of data. Varimax rotation explored the data set with 25 iterations. Factor loadings below .500 were eliminated to realize a more vital separation of components, and eigenvalues greater than one were exposed. The data adequacy was determined by Keiser-Meyer-Olken and Bartlett's Test of Sphericity tested the facts if it is appropriate for factor analysis. Catteel-Scree Plot determined the factors retained, and Thematic analysis was used to generate the constructs.

Entrepreneurial orientation is described in various literature as a set of characteristics or perspectives that underlie an individual's activities, such as risk taking, innovativeness, proactiveness, competitive aggressiveness, learning orientation, and achievement orientation (Suwarno, Malinda, Margaretha, & Aliwinoto, 2023). Some literature posits that perceived desirability, perceived feasibility and propensity are the three dimensions of entrepreneurial intention (Abdelkarim, 2021; Amani, Ismail, Makona, Changalima, & Kazungu, 2024; Indarwati & Syahran, 2024). However, some literature suggests that the six dimensions of the entrepreneurial intention of senior high school students include self-efficacy, perceived desirability, entrepreneurship education, need for achievement, the propensity to risk, and the propensity to act (Mante & Abellanosa, 2022). Entrepreneurial self-efficacy is people's belief in their ability to exert control over their functioning and events that affect their lives (de Gracia & Campos, 2023). The perceived desirability refers to the degree to which he/she feels attraction for a given behavior to become an entrepreneur (Tan, Pham, & Bui, 2021). However, the perceived feasibility is defined as the degree to which people consider themselves personally able to carry out certain behavior (Kariv, Krueger, Cisneros, & Kashy-Rosenbaum, 2023). Existent literature posits that the presence of role models, mentors or partners would be a decisive element in establishing the individual's entrepreneurial feasibility level (AbdulMumin, Ringim, Abdullahi, & Musa, 2024). In contrast, the propensity to act refers to an individual's willingness to act on decision (Inoubli, 2024).

Empirical Review
This section presents the empirical review relevant to the study.

Effect of Problem-Based Learning on Entrepreneurial Intention
In the context of Spain, Baena-Luna *et al.* (2024) examined the influence of the problem-based learning methodology on the intrapreneurial intentions of university students. The results revealed that the problem-based learning methodology significantly improved the behavior of variables associated with potentially intrapreneurial behaviors. Specifically, the findings showed that the three components, namely subjective norms, perceived behavioral control, and risk-taking capacity, positively influenced undergraduate students' intrapreneurial intentions. The results suggested that the problem-based learning methodology can be a valuable tool for universities in developing initiatives to improve graduate employability.

Liu and Pásztor (2022) conducted meta-analysis on the effect of problem-based learning instructional intervention on critical thinking in higher education in Hungary. The findings revealed that the problem-based learning methodology significantly improved the critical thinking in higher education. The results suggested that the problem-based learning methodology can be a valuable tool for higher education in developing initiatives to improve graduate critical thinking.

Naparin (2024) the role of problem-based learning in improving wetlands entrepreneurial orientation with problem-based learning at the Purun Crafts Center in South Kalimantan, Indonesia. The results showed that there was significant difference in the level of entrepreneurial orientation before and after the implementation of problem-based learning. The findings revealed that there had been an increase in the level of entrepreneurial orientation from pre-test scores ranging between 1,630 and 2,982 and post-test scores between 2,364 and 3,498.

Sousa and Costa (2022) examined the role of problem-based learning in discovering entrepreneurship competencies through in higher education students. The research focused on the competencies developed by students in problem-based learning and the competencies identified by the students sufficiently learned in universities. The research revealed that the use of problem-based learning has significant potential in the development of entrepreneurship competencies that should be further explored in greater depth.

Effect of Problem-Based Learning on Entrepreneurial Intention
In the context of Spain, Hasanuddin, Wolok, Sunardi, and Larosa (2024) examined the impact of project-based learning on creative products and entrepreneurship subjects on students' entrepreneurial intention and readiness vocational schools-centers of excellence in Gorontalo Province. The results indicated that project-based learning in creative product and entrepreneurship subjects contributed 42.3% to entrepreneurial intentions and 33.6% to the entrepreneurial readiness of central vocational school of excellence students. on the competency of machining engineering skills. The research revealed that project-based learning provides student-centered learning opportunities, where students are actively involved in completing projects collaboratively.

Shekarian and Parast (2021) examined the effect of project-based learning on entrepreneurship skills and project performance. The findings indicated that the appearance self-efficacy is the variable that most significantly contributes to project performance, followed by social skills, then management skills. The research provides insights into how entrepreneurship skills can be viewed as important skillsets for success in projects and how operations and project managers can emphasize certain entrepreneurship skills to enhance project performance. The results indicated that at the individual level, entrepreneurship skills can be viewed as skillsets that improve project performance even in projects that are less entrepreneurial in nature.

Masdarini, Candiasa, Agustini, and Sudatha (2024) examined the effect of project-based learning and self-efficacy towards students' entrepreneurial readiness in vocational high school. The findings showed that project-based learning along with self-efficacy contributed to students' entrepreneurial readiness. The results indicated that project-based learning boosted students' entrepreneurial readiness, since they became the center of the learning process.

Zulfikar (2024) examined the role of project-based learning in implementing entrepreneurial character and high-level thinking skills for students. The findings indicated that project-based learning can have a positive influence on instilling entrepreneurial character, although it requires time. The results showed that the project-based learning method can have a big influence on high-level thinking skills for students. Additionally, the results indicated that the high-level thinking (high order thinking skills) is often experienced by students when it is a transfer of knowledge from the lecturer.

METHODOLOGY
The research was grounded on the positivist research philosophy, which regards the world as made up of observable and measurable facts and assumes that there is an objective reality out there. The study employed the correlational, cross-sectional survey research design to test non-causal relationships among variables without controlling any of the variables. The target population consisted of 24680 students in university technical and vocational education and training institutions in Kenya. Table 1 presents the target population.

Table 1: Target Population

Strata	Target Population	Percentage
JKUAT TVET Institute	250	1.01%
TUM TVET Institute	2992	12.12%
MksU TVET Institute	1718	6.96%
TUK TVET Institute	10500	42.54%
PU TVET Institute	518	2.10%
SEKU TVET Institute	500	2.03%
JOOUST TVET Institute	602	2.44%
MMUST TVET Institute	2800	11.35%
KIBU TVET Institute	700	2.84%
MUT TVET Institute	4100	16.61%
Total	24680	**100.00%**

 Source: TVETA (2023)

The sampling frame consisted of the list of the 24680 students in university technical and vocational education and training institutions in Kenya. This was as per the TVETA (2023)'s database as at 31st December, 2023. Yamane (1967)'s formula was used to determine the sample size of 394 and verify that the sample size was sufficiently large (Hiebl, 2023). Therefore, the minimum recommended sample size consisted of 394 students in university technical and vocational education and training institutions in Kenya. Table 2 presented the sample size.

Table 2: Sample Size

Strata	Target Population	Sample Size
JKUAT TVET Institute	250	4
TUM TVET Institute	2992	48
MksU TVET Institute	1718	27
TUK TVET Institute	10500	168
PU TVET Institute	518	8
SEKU TVET Institute	500	8
JOOUST TVET Institute	602	10
MMUST TVET Institute	2800	45
KIBU TVET Institute	700	11
MUT TVET Institute	4100	65
Total	**24680**	394

The proportionate stratified random sampling technique was utilized to select a sample size of 394 students from a target population of 24680 students in university technical and vocational education and training institutions in Kenya. A structured self-administered survey questionnaire was used as the means of collecting primary data, because of its ability to collect a large amount of information in a reasonably quick span of time (Saunders *et al.*, 2023).

Data processing was conducted prior to the data analysis. The collected data was checked for accuracy, completeness and consistency. The data was coded, edited, and entered into the Statistical Package for Social Sciences (SPSS) version 26 to create a data sheet that was used for statistical analysis.

Descriptive analysis of the collected data was conducted to compute, summarize the data in respect to each variable, and describe the sample's characteristics. The descriptive analysis aims at summarizing distributions and describing a set of data on factors of the study (Bell *et al.*, 2022). The Pearson's product moment correlation analysis was performed to confirm or deny the relationship between the study variables. The Pearson's product moment correlation analysis is performed to determine the nature and the strength of the linear relationship between the variables (Saunders *et al.*, 2023). A standard multiple linear analyses was

conducted with entrepreneurial intention as the dependent variable and student-centered learning, problem-based learning case-based learning and project-based learning as predictor variables. The standard multiple linear regressions model was specified as:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \varepsilon \quad \ldots\ldots \text{ Model 1}$$

Where:

Y = Entrepreneurial Intention

β_0 = Constant Term

$\beta_1 - \beta_4$ = Regression Coefficients to be estimated

X_1 = Problem-Based Learning

X_2 = Project-Based Learning

ε = Stochastic Error Term

In total, two null hypotheses were tested at 5% level of significance ($\alpha = 0.05$; t = 1.960) at a 95% confidence level to statistically help draw acceptable and realistic inferences. Therefore, the decision rule was to reject the null hypothesis $H_0 i$ if the $P \leq 0.05$, and otherwise fail to reject the null hypothesis $H_0 i$ if the $P > 0.05$. In hypothesis testing at 5% level of, the decision rule is to reject the null hypothesis $H_0 i$ if the $P \leq 0.05$, and otherwise fail to reject the null hypothesis $H_0 i$ if the $P > 0.05$ (Saunders *et al.*, 2022). Table 3 presents hypotheses testing procedure.

Table 3: Hypotheses Testing

Hypotheses		Model	Hypotheses Testing	Decision Rule
$H_0 1$:	Problem-based learning has no significant effect on entrepreneurial intention in university technical and vocational education and training institutions in Kenya.	$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \varepsilon \ldots$ Model 3.1	Multiple regression analysis	$H_0 1$: $\beta_1 = 0$ $H_1 1$: $\beta_1 \neq 0$ If the $P \leq 0.05$ reject the $H_0 1$. If the $P > 0.05$ fail to reject the $H_0 1$.
$H_0 2$:	Project-based learning has no significant effect on entrepreneurial intention in university technical and vocational education and training institutions in Kenya.			$H_0 2$: $\beta_2 = 0$ $H_1 2$: $\beta_2 \neq 0$ If the $P \leq 0.05$ reject the $H_0 2$. If the $P > 0.05$ fail to reject the $H_0 2$.

FINDINGS AND DISCUSSIONS

Response Rate

Out of the 394 survey questionnaires distributed, only 276 usable survey questionnaires were received. Therefore, there was a valid response rate of 70.05%, which was sufficient for data analysis and reporting purposes. Existent literature posits that survey response rates of 70% or higher are needed if findings are to be considered generalizable (Ericson *et al.*, 2023). Table 4 presents the response rate results.

Table 4: Response Rate

Strata	Frequency	Percentage
Response	276	70.05%
Non-Response	118	29.95%
Total	**394**	**100.00%**

Correlation Analysis Results

The Pearson's product moment correlations analysis was performed to confirm or deny the relationships between the study variables. The correlation results indicated that problem-based learning had moderately strong positive and significant relationship with entrepreneurial intention ($r = 0.425$, $p \leq 0.05$) in university technical and vocational education and training institutions in Kenya. The correlation results showed that project-based learning had a strong positive and significant relationship with entrepreneurial intention ($r = 0.581$, $p \leq 0.05$) in university technical and vocational education and training institutions in Kenya. Table 5 presents the Pearson's product moment correlations analysis results.

Table 5: The Pearson's Product Moment Correlations Results

Variable		X_1	X_2	Y
Problem-Based Learning (X_1)	Pearson Correlation	1		
	Sig. (2-tailed)			
	n	276		
Project-Based Learning (X_2)	Pearson Correlation	.442**	1	
	Sig. (2-tailed)	.000		
	n	276	276	
Entrepreneurial Intention (Y)	Pearson Correlation	.425**	.581**	1
	Sig. (2-tailed)	.000	.000	
	n	276	276	276

**. Correlation is significant at the 0.01 level (2-tailed).

Multiple Linear Regressions Analysis Results

A standard multiple linear regression analysis was performed with entrepreneurial intention as the dependent variable and problem-based learning and project-based learning as the predictor variables.

Model Summary

From the model summary in table, it is clear that the value of coefficient of correlation (R) was 0.610, while the value of coefficient of determination (R^2) was 0.372, while the value of the adjusted R^2 was 0.367. Additionally, the value of the std. error of the estimate was 0.277 and the value of the Durbin-Watson test was 2.265. The coefficient of correlation (R) value of 0.610 suggest that there was a strong positive correlation between the predictor variables (problem-based learning and project-based learning) and entrepreneurial intention in university technical and vocational education and training institutions in Kenya. The R^2 value of 0.372 suggest that the overall model as a whole (the model involving constant, problem-based learning and project-based learning) was able to significantly predict and explain approximately 37.2% of the variance in the entrepreneurial intention in university technical and vocational education and training institutions in Kenya.

The Adjusted R Square value of 0.367 suggest that the overall model as a whole (the model involving constant, problem-based learning and project-based learning) significantly predicted and explained 36.7% of the variance in the entrepreneurial intention in university technical and vocational education and training institutions in Kenya. The std. error of the estimate value of 0.277 suggest that there could be other factors not included in the model in the current study that could also predict and explain the remaining 63.3% of the variance in the entrepreneurial intention in university technical and vocational education and training institutions in Kenya. Therefore, there is in need for future research to discover the other variables not included in the model in the current study that also predict the remaining variance in the entrepreneurial intention in university technical and vocational education and training institutions in Kenya. From the model summary table, the Durbin-Watson test statistic had a value of 2.265, falling within the optimum range of 1.5 to 2.5, suggesting that there was no severe autocorrelation detected in the in the residual values in the datasets. Existent literature posits that the Durbin-Watson statistics falling within the optimum range of 1.5 to 2.5 indicates that there is no severe autocorrelation detected in the in the residual values in the datasets (Hair *et al.*, 2021). Table 6 presents the model summary results.

Table 6: Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.610[a]	.372	.367	.277	2.265

a. Predictors: (Constant), Project-Based Learning (X_2), Problem-Based Learning (X_1)

b. Dependent Variable: Entrepreneurial Intention (Y)

Analysis of Variance

From the Analysis of Variance (ANOVA) table results, the overall multiple regression model (the model involving constant, problem-based learning and project-based learning), achieved a high degree of fit, as reflected by R = 0.610, R^2 = 0.372, adj. R^2 = 0.367, F (2, 273) = 80.875, p < 0.05. The results revealed that the model as a whole was able to significantly predict the entrepreneurial intention in university technical and vocational education and training institutions in Kenya. The results led to the rejection of the null hypothesis that the linear combination of the predictor variables (problem-based learning and project-based learning) does not significantly predict the entrepreneurial intention in university technical and vocational education and training institutions in Kenya. Therefore, the linear combination of the predictor variables (problem-based learning and project-based learning) significantly predicted entrepreneurial intention in university technical and vocational education and training institutions in Kenya. Table 7 presents the standard multiple linear regression's ANOVA results.

Table 7: ANOVA[a] Results

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12.444	2	6.222	80.875	.000[b]
	Residual	21.003	273	.077		
	Total	33.447	275			

a. Dependent Variable: Entrepreneurial intention (Y)

b. Predictors: (Constant), Project-Based Learning (X_2), Problem-Based Learning (X_1)

Multiple Regression Coefficients

From the coefficients table, when the unstandardized regression coefficients (B) were substituted to the multiple regression model specified for the study, the final predictive equation was:

$$Y = 2.343 + 0.143X_1 + 0.257X_2$$

The final predictive equation suggested that holding all factors in to account constant (problem-based learning and project-based learning), constant at zero, the entrepreneurial intention in university technical and vocational education and training institutions in Kenya would be 2.343. The final predictive equation postulated that with all other factors held constant, a unit increase in problem-based learning would lead to 0.143 unit increase in the entrepreneurial intention in university technical and vocational education and training institutions in Kenya. The final predictive equation suggested that with all other factors held constant, a unit increase in project-based learning would lead to 0.257 unit increase in the entrepreneurial intention in university technical and vocational education and training institutions in Kenya. Based on the magnitude of the unstandardized regression coefficients (B) of the independent variables, project-based learning was the best predictor of the value of in the entrepreneurial intention in university technical and vocational education and training institutions in Kenya.

The regression results indicated that problem-based learning had a positive and significant effect on entrepreneurial intention (β_1 = 0.209; t = 3.901; $p \leq 0.05$) in university technical and vocational education and training institutions in Kenya. The regression results indicated that project-based learning had a positive and significant effect on entrepreneurial intention (β_2 = 0.488; t = 9.130; $p \leq 0.05$) in university technical and

vocational education and training institutions in Kenya. Table 8 presents the multiple regressions coefficients results.

Table 8: The Multiple Regressions Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1 (Constant)	2.343	.137		17.053	.000		
Problem-Based Learning (X_1)	.143	.037	.209	3.901	.000	.804	1.243
Project-Based Learning (X_2)	.257	.028	.488	9.130	.000	.759	1.318

a. Dependent Variable: Entrepreneurial Intention (Y)

Hypotheses Test Results

In total, two null hypotheses were tested at 95% confidence level, $\alpha = 0.05$, and t = 1.960 to statistically help draw acceptable and realistic inferences. Therefore, the decision rule was to reject the null hypothesis H_0i if the $P \leq 0.05$, and otherwise fail to reject the null hypothesis H_0i if the $P > 0.05$. In hypotheses testing at 5% level of significance ($\alpha = 0.05$) and 95% confidence level, the decision rule is to reject the null hypothesis H_0i if the $P \leq 0.05$, and otherwise fail to reject the null hypothesis H_0i if the $P > 0.05$ (Bell *et al.*, 2022).

Hypothesis One Test Results

The first null hypothesis (H_01) predicted that showed that problem-based learning has no significant effect on entrepreneurial intention in university technical and vocational education and training institutions in Kenya. The decision rule was to reject the null hypothesis H_01 if the $\beta_1 \neq 0$, $t \geq 1.960$, $P \leq 0.05$, and otherwise fail to reject the null hypothesis H_01 if the $\beta_1 = 0$, $t < 1.960$, $P > 0.05$. The standard multiple regression results showed that problem-based learning had a positive and significant effect on entrepreneurial intention ($\beta_1 = 0.295$; t = 3.507; $p \leq 0.05$) in university technical and vocational education and training institutions in Kenya. Consequently, the H_01 was rejected, providing the empirical support for H_11. Therefore, conclusion was made that problem-based learning has a significant effect on performance of university technical and vocational education and training institutions in Kenya.

Hypothesis Two Test Results

The second null hypothesis (H_02) predicted that project-based learning has no significant effect on entrepreneurial intention in university technical and vocational education and training institutions in Kenya. The decision rule was to reject the null hypothesis H_02 if the $\beta_2 \neq 0$, $t \geq 1.960$, $P \leq 0.05$, and otherwise fail to reject the null hypothesis H_02 if the $\beta_2 = 0$, $t < 1.960$, $P > 0.05$. The standard multiple regression results showed that project-based learning had a positive and significant effect on entrepreneurial intention ($\beta_2 = 0.594$; t = 7.061; $p \leq 0.05$) in university technical and vocational education and training institutions in Kenya. Consequently, the H_02 was rejected, providing the empirical support for H_12. Therefore, conclusion was made that project-based learning has a significant effect on entrepreneurial intention in university technical and vocational education and training institutions in Kenya. Table 9 presents the hypotheses test results.

Table 9: Hypotheses Test Results

Hypothesis	β	t	Sig.	Decision
H_01: Problem-based learning has no significant effect on entrepreneurial intention in university technical and vocational education and training institutions in Kenya.	.295	3.507	.001	Reject the H_01
H_02: Project-based learning has no significant effect on entrepreneurial intention in university technical and vocational education and training institutions in Kenya.	.594	7.061	.000	Reject the H_02

Discussions of Key Findings

This section presents a discussion of the key findings of the study. The general objective of this quantitative non-experimental correlational study was to examine the effect of competency-based learning on entrepreneurial intention in university technical and vocational education and training institutions in Kenya. Specifically, the study examined the effect of problem-based learning and project-based learning on entrepreneurial intention in university technical and vocational education and training institutions in Kenya. The Pearson's product moment correlations analysis results indicated that there was a strong positive and significant relationship between entrepreneurial intention and entrepreneurial intention in university technical and vocational education and training institutions in Kenya. The regression results showed that entrepreneurial intention had positive and significant effect on entrepreneurial intention in university technical and vocational education and training institutions in Kenya. The results were consistent with the findings of past studies (Murrey, 2021; Murrey, Kibeti, & Nassiuma, 2021).

Effect of Problem-Based Learning on Entrepreneurial Intention

The first specific objective was to determine the effect of problem-based learning on entrepreneurial intention in university technical and vocational education and training institutions in Kenya. The first null hypothesis ($H_0 1$) predicted that problem-based learning has no significant effect on entrepreneurial intention in university technical and vocational education and training institutions in Kenya. The Pearson's correlation results indicated that there was a moderately strong positive and significant relationship between problem-based learning on entrepreneurial intention in university technical and vocational education and training institutions in Kenya. The regression results showed that problem-based learning had a positive and significant effect on entrepreneurial intention in university technical and vocational education and training institutions in Kenya. Therefore, the $H_0 1$ was rejected, providing the empirical support for $H_1 1$. Subsequently, conclusion was made that project-based learning has a significant effect on entrepreneurial intention in university technical and vocational education and training institutions in Kenya. The findings are in line with the results of previous studies (Murrey, 2021; Murrey *et al.*, 2021; Naparin, 2024; Sousa & Costa, 2022).

Effect of Project-Based Learning on Entrepreneurial Intention

The second specific objective was to establish the influence of project-based learning on entrepreneurial intention in university technical and vocational education and training institutions in Kenya. The second null hypothesis ($H_0 2$) predicted that project-based learning has no significant effect on entrepreneurial intention in university technical and vocational education and training institutions in Kenya. The Pearson's correlation results indicated that project-based learning had a strong positive and significant relationship with the entrepreneurial intention in university technical and vocational education and training institutions in Kenya. The regression results showed that project-based learning had a positive and significant effect on entrepreneurial intention in university technical and vocational education and training institutions in Kenya. Therefore, the $H_0 2$ was rejected, providing the empirical support for $H_1 2$. Consequently, conclusion was made that project-based learning has a significant effect on entrepreneurial intention in university technical and vocational education and training institutions in Kenya. The findings are in harmony with the results of past studies (Masdarini *et al.*, 2024; Shekarian & Parast, 2021; Wolok *et al.*, 2024; Zulfikar, 2024).

CONCLUSIONS

The purpose of this study was to examine the effect of competence-based learning on entrepreneurial intention in university technical and vocational education and training institutions in Kenya. Specifically, the study examined the effect of problem-based learning and project-based learning on entrepreneurial intention in university technical and vocational education and training institutions in Kenya. The Pearson's correlations results indicated that the entrepreneurial intention had positive and significant relationship with entrepreneurial intention in university technical and vocational education and training institutions in Kenya. The regression results showed that of competence-based learning had positive and significant effect on

entrepreneurial intention in university technical and vocational education and training institutions in Kenya. Therefore, the conclusion was that competence-based learning has a significant effect on entrepreneurial intention in university technical and vocational education and training institutions in Kenya.

The first specific objective was to examine of problem-based learning on entrepreneurial intention in university technical and vocational education and training institutions in Kenya. The first null hypothesis (H_01) predicted that showed that problem-based learning has no significant effect on entrepreneurial intention in university technical and vocational education and training institutions in Kenya. The Pearson's correlation results indicated that problem-based learning had a moderately strong positive and significant relationship with entrepreneurial intention in university technical and vocational education and training institutions in Kenya. The regression results showed that problem-based learning had a positive and significant effect on entrepreneurial intention in university technical and vocational education and training institutions in Kenya. Therefore, the H_01 was rejected, providing the empirical support for H_11. Subsequently, the first conclusion was that problem-based learning has a significant effect on entrepreneurial intention in university technical and vocational education and training institutions in Kenya.

The second specific objective was to establish the effect of project-based learning on entrepreneurial intention in university technical and vocational education and training institutions in Kenya. The second null hypothesis (H_02) predicted that project-based learning has no significant effect on entrepreneurial intention in university technical and vocational education and training institutions in Kenya. The Pearson's correlation results indicated that project-based learning had a strong positive and significant relationship with entrepreneurial intention in university technical and vocational education and training institutions in Kenya. The regression results showed that project-based learning had a positive and significant effect on entrepreneurial intention in university technical and vocational education and training institutions in Kenya. Consequently, the H_02 was rejected, providing the empirical support for H_12. Therefore, the second conclusion was that project-based learning has a significant effect on entrepreneurial intention in university technical and vocational education and training institutions in Kenya.

RECOMMENDATIONS
The study provides significant managerial recommendations. The study recommends that it is imperative for the management to implement competency-based learning to foster entrepreneurial intention in technical and vocational education and training institutions. First, the management should consider strengthening the problem-based learning to foster the performance of university technical and vocational education and training institutions in Kenya. Second, the management should consider enhancing the project-based learning to foster the performance of university technical and vocational education and training institutions in Kenya.

The study provides important policy recommendations. The policy makers within the Ministry of Education especially the Technical and Vocational Education and Training Authority Technical and Vocational Education and Training Authority should consider initiating policy review to encourage the management to implement competency-based learning to foster entrepreneurial intention in technical and vocational education and training institutions. First, policy makers should consider initiating policy review to encourage the management to implement problem-based learning to foster entrepreneurial intention in technical and vocational education and training institutions. Second, policy makers should initiate policy review to inspire the management to implement problem-based learning to foster entrepreneurial intention in technical and vocational education and training institutions.

Areas for Future Research
The study points to several intriguing paths for future research. First, future researchers should consider examining the effect of competency-based learning on entrepreneurial intention in technical and vocational education and training institutions in other regions or contexts. Second, future researchers should consider

utilizing the longitudinal survey to examine the effect of competency-based learning on entrepreneurial intention over a period to time. Third, future researchers should consider examining the mediating effect of entrepreneurial competences on the relationship between competency-based learning and entrepreneurial intention in other sectors or contexts.

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