



Student Engagement in Real-World Projects on the Development of Innovative Skills among Students in Public Secondary Schools in Busega District, Tanzania

Sumayi James^{1*}, Michaela Mhagama², Raymond Ndomba³

¹ Busega District

^{2,3} Department of Education Foundations, St. Augustine University of Tanzania

Correspondence e-mail * : jamessumayi57@gmail.com

Abstract : This study examined the influence of student engagement in real-world projects on the development of innovative skills among students in public secondary schools in Busega District, Tanzania. The study was guided by Multiple Intelligences Theory. A mixed research approach using a convergent parallel research design was employed. The study involved a target population of 14,615 participants, from which a sample of 202 respondents was selected, including students, teachers, heads of schools, Ward Education Officers, and the District Education Officer. Data were collected through questionnaires and semi-structured interviews. Quantitative data were analysed using frequencies and percentages through SPSS version 27, while qualitative data were analysed thematically. The findings revealed that students' engagement in real-world projects significantly enhanced innovative skills through teamwork, practical application of knowledge, problem-solving activities, and collaborative discussions. The results showed that 86.4% of teachers engaged students in real-world tasks, while 93.9% of students confirmed their participation in teamwork during project-based learning activities. However, the study identified challenges including inadequate resources, limited instructional time, and variations in teachers' preparedness, which affected the effective implementation of project-based learning. The study concludes that real-world project engagement is an effective approach for developing students' innovative skills. It recommends strengthening teacher professional development, improving learning resources, and creating supportive school environments to enhance the implementation of project-based learning in public secondary schools.

Keyword : Student Engagement, Real-World Projects, Development, Innovative Skills

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INTRODUCTION

The development of innovative skills among students has become an important priority in contemporary education systems due to increasing social, economic, technological, and workplace changes. Schools are increasingly expected to equip learners with creativity, critical thinking, problem-solving, collaboration, communication, adaptability, and the capacity to generate solutions to real-world challenges (Babalola & Keku, 2024; Nderego, 2026). Learner-centred and project-oriented approaches have received growing attention because they provide students with opportunities to participate actively in learning, investigate problems, and apply knowledge in practical contexts (Artama et al., 2023; Sijali et al., 2025). Such approaches can help students move beyond memorisation towards the development of higher-order thinking and innovative competencies (Cheema et al., 2026; Nderego, 2026). Therefore, contemporary education increasingly emphasizes learning experiences that enable students to become active creators and users of knowledge rather than passive recipients of information (Babalola & Keku, 2024).

Student engagement in real-world projects has emerged as an important approach for promoting active learning and strengthening students' innovative abilities. Real-world projects involve learners in identifying authentic problems,

conducting investigations, generating ideas, developing solutions, creating products, and reflecting on their experiences (Mkimbili et al., 2025; Happiness et al., 2025). Such activities enable students to connect classroom knowledge with practical situations while developing creativity, critical thinking, collaboration, communication, and problem-solving skills (Mcharo & Wandela, 2024; Ndulila, 2026). Mkimbili et al. (2025) found that project work enabled Tanzanian secondary school students to develop research, problem-solving, creativity, communication, collaboration, and leadership skills. Similarly, Happiness et al. (2025) reported that project-based learning enhanced students' creativity, critical thinking, communication, collaboration, autonomy, and motivation in public secondary schools. These findings suggest that meaningful participation in real-world projects can transform students from passive recipients of knowledge into active participants in knowledge creation and solution development (Artama et al., 2023).

Globally, recent studies have demonstrated that project-based learning and authentic learning experiences contribute to students' creativity, innovative thinking, and higher-order competencies. Babalola and Keku (2024) found that Ethno-STEM integrated project-based learning improved creative thinking among secondary school students by

engaging them in contextualized practical activities. Artama et al. (2023) similarly established that project-based learning can promote twenty-first-century skills through active and collaborative learning experiences. Pang and Wu (2021) found that project-based learning positively influenced students' innovative thinking through processes such as observing, questioning, connecting ideas, and generating solutions. More recent evidence indicates that project-based assessment can also strengthen students' creative thinking and problem-solving abilities (Mcharo & Wandela, 2024). In addition, Happiness et al. (2025) reported that students involved in project-based learning demonstrated improved creativity, critical thinking, collaboration, communication, autonomy, and motivation. Thus, evidence from different educational contexts indicates that authentic project engagement provides learners with opportunities to generate ideas, experiment with alternatives, collaborate with others, and develop innovative solutions (Ndulila, 2026).

In African contexts, project-based and practical learning have become increasingly important because education systems are expected to prepare learners with competencies relevant to employment, entrepreneurship, community development, and sustainable development. Babalola and Keku (2024) demonstrated in Nigeria that

project-based learning integrated with Ethno-STEM activities can strengthen secondary students' creative thinking through contextualized learning experiences. Recha and Ndambuki (2024) found in Kenya that the availability of financial resources influences the implementation of project-based learning in secondary schools. Similarly, competence-based practical education can contribute to the development of innovative agripreneurship skills among Kenyan learners. Teacher preparedness is also important because teachers require appropriate pedagogical competencies to facilitate inquiry, experimentation, collaboration, and problem-solving (Sijali et al., 2025). Mwakabenga and Paine (2024) further observed that examination-oriented practices and knowledge memorisation can constrain active learning within competency-based education. These findings indicate that the effectiveness of real-world project engagement in African schools depends on adequate resources, teacher competence, appropriate pedagogy, and supportive learning environments.

In Tanzania, curriculum reforms have increasingly emphasized competency-based education and learner-centred pedagogies intended to develop creativity, critical thinking, problem-solving, collaboration, and the practical application of knowledge. Tarmo and Kimaro (2021) noted that competency-based education in Tanzania requires learning approaches

that enable students to demonstrate practical competencies rather than merely reproduce academic knowledge. More recent evidence shows that project-based learning is particularly relevant to these curriculum expectations (Ndulila, 2026). Nderego (2026) found that learner-centred activities and the integration of real-life situations are important for promoting higher-order thinking among Tanzanian secondary school students. Similarly, Cheema et al. (2026) reported that competency-based curricula supported by technology can promote creativity, critical thinking, and student participation in Tanzanian secondary schools. Mihambo and Amos (2025) also found that effective implementation of competency-based education requires learner-centred strategies such as project-based learning, group discussion, and problem-based learning. Therefore, the Tanzanian curriculum context provides a strong justification for examining students' engagement in real-world projects as a means of developing innovative skills.

Despite the emphasis on competency-based and learner-centred education in Tanzania, recent evidence indicates that the implementation of project work and authentic learning remains uneven in secondary schools. Mkimbili et al. (2025) found that although project work provides students with opportunities to develop creativity, problem-solving, research,

communication, collaboration, and leadership skills, many schools continue to treat projects mainly as continuous assessment activities. Timothy (2025) similarly identified challenges in supervising students' science project work in Tanzanian secondary schools, particularly where large classes and inadequate resources restrict effective project implementation. Mcharo and Wandela (2024) established a positive relationship between project-based assessment and students' creativity and problem-solving skills, although implementation challenges remain. Happiness et al. (2025) also found that project-based learning can enhance creativity, critical thinking, collaboration, communication, autonomy, and motivation among students in Tanzanian public secondary schools. At the national level, Ndulila (2026) reported a gap between teachers' awareness of project-based learning and its actual classroom implementation, indicating that the presence of curriculum expectations does not necessarily translate into extensive student engagement in projects. Therefore, although existing studies have examined project-based learning, creativity, and competency-based education, limited empirical attention has been given specifically to the influence of students' engagement in real-world projects on the development of innovative skills among students in public secondary

schools. This gap justifies the present study.

Theoretical Review

The Multiple Intelligences Theory was developed by Howard Gardner in 1983 and introduced in his book *Frames of Mind: The Theory of Multiple Intelligences*. The theory challenges the traditional view that intelligence is measured through a single ability such as IQ and proposes that individuals possess different forms of intelligence, including linguistic, logical-mathematical, spatial, bodily-kinesthetic, interpersonal, intrapersonal, musical, naturalistic, and existential intelligence. The theory assumes that learners have diverse abilities that can be developed through appropriate learning experiences and that education should provide opportunities for students to apply their unique strengths in solving problems and creating new ideas. This theory is relevant to the study because engagement in real-world projects allows students to apply different forms of intelligence when investigating problems, collaborating with peers, designing solutions, and creating innovative products. Therefore, it helps explain how project participation supports the development of students' creativity, problem-solving abilities, and innovative skills in public secondary schools.

Literature Review

Student engagement in real-world projects through Project-Based Learning (PBL) has been recognized as an effective approach for developing innovative skills among learners by connecting theoretical knowledge with practical experiences. Through participation in authentic projects, students are encouraged to identify problems, generate ideas, collaborate with others, and develop creative solutions to real-life challenges. Dullente and Namoco (2024) found that Grade 8 students in the Philippines who participated in PBL activities demonstrated significantly higher learning and innovation skills compared with those taught through traditional methods. Similarly, Cao (2024) in China revealed that PBL increased students' engagement, autonomy, and self-regulated learning, enabling them to develop creativity, problem-solving abilities, and innovation-related behaviours. Ali (2025) further reported that integrating real-world community challenges into PBL enhanced students' curiosity, ownership of learning, resilience, and ability to engage in proactive inquiry and solution development.

Studies from developed countries further demonstrate that real-world project engagement enhances students' innovative competencies by providing opportunities for meaningful learning experiences. McNall et al. (2023) in the United States found that environmental-based

projects increased students' motivation, collaboration, communication, and ability to apply scientific knowledge in solving community problems. Likewise, Oliveira (2025) in Canada showed that sustainability-focused projects improved students' creativity, responsibility, and confidence as learners designed solutions to environmental challenges. In Indonesia, Maulina (2024) found that PBL significantly improved student participation, motivation, confidence, and learning outcomes, with students appreciating the connection between classroom activities and real-world applications. Similarly, Sah et al. (2024) emphasized that PBL strengthens critical thinking, creativity, teamwork, communication skills, and digital literacy by requiring students to apply knowledge in solving authentic problems.

In African contexts, research indicates that real-world project engagement contributes to the development of practical competencies, creativity, and problem-solving abilities among learners. Boakye-Yiadom et al. (2025) found that PBL enabled Ghanaian students to engage with indigenous knowledge through practical projects, improving their understanding, creativity, and appreciation of cultural resources. In Nigeria, Ochigbo (2023) revealed that PBL was more effective than conventional approaches in improving students' critical thinking skills and

academic achievement. Similarly, Gemson et al. (2025) found that PBL enhanced students' interest and performance in Chemistry compared with guided discovery methods. These studies suggest that engaging students in authentic projects provides learning experiences that promote innovation, independence, collaboration, and the ability to address real-world challenges.

In Tanzania, education reforms have increasingly emphasized learner-centred approaches that promote creativity, problem-solving, and practical skills development. Mbilingi (2024) argues that PBL provides an alternative to traditional teaching methods by actively involving students in solving complex real-life problems and developing transferable skills. Similarly, Mcharo and Wandela (2024) found that students who frequently participated in project-based assessments demonstrated higher levels of creativity and problem-solving abilities compared with those with limited exposure to such activities. However, despite the potential benefits of real-world projects, their implementation in public secondary schools remains limited due to challenges such as inadequate resources, limited teacher preparedness, and insufficient support systems. Therefore, examining the influence of student engagement in real-world projects on the development of innovative skills among students in public secondary schools in Tanzania is

essential for understanding how schools can strengthen learning approaches that prepare students for future social, economic, and technological demands.

METHODOLOGY

The study employed a mixed research approach using a convergent parallel research design to examine the influence of student engagement in real-world projects on the development of innovative skills among students in public secondary schools in Busega District, Tanzania. The study involved a target population of 14,615 participants, comprising 13,820 students, 733 teachers, 28 heads of schools, 15 Ward Education Officers (WEOs), and 1 District Education Officer (DEO). A total sample of 202 respondents was selected, including 99 students, 88 teachers, 6 heads of schools, 2 WEOs, and 1 DEO. The study used stratified sampling, simple random sampling, and purposive sampling to obtain representative participants. Data were collected through questionnaires administered to students and teachers and semi-structured interviews conducted with heads of schools, WEOs, and the DEO. Instrument validity was ensured through expert review and pilot testing, while reliability was established using test-retest procedures. Quantitative data were analyzed using SPSS version 27 through frequencies and percentages, whereas qualitative data were analyzed

thematically. Ethical considerations included obtaining research permission, informed consent, confidentiality, voluntary participation, and proper citation of sources.

RESULT AND DISCUSSION

Findings

This study explored student engagement in real-world projects that foster innovative skills. Data were collected through interviews and questionnaires to obtain detailed information on students' engagement in a real-world project to foster innovative skills. Two aspects were developed: students' engagement in real-world projects to foster innovative skills and the influence of students' engagement on their ability to think creatively in real-world settings. Teachers and students gave the responses for this item through a questionnaire.

1. Teachers' Response to Student Engagement in Real-World Projects on Fostering Innovative Skills

This section presents teachers' responses on student engagement in real-world projects and how such engagement contributes to the development of students' innovative skills. Thus, the findings are shown in Table 1.

Table 1.
Teachers’ Response to Student Engagement in Real-World Projects on Fostering Innovative Skills

Statement	Strongly Disagree		Disagree		Undecided		Agree		Strongly Agree	
	F	%	F	%	F	%	F	%	F	%
Engage ment of Student s in Real- World Learnin g Activiti es	6	6.8	1	1.1	5	5.7	54	61.4	22	25.0
Alignm ent of Real- World Tasks with Subject Content	1	1.1	1	1.1	6	6.8	40	45.5	40	45.5
Applica tion of Classro om Knowle dge to Real- Life Situatio ns	2	2.3	1	1.1	5	5.7	36	40.9	44	50.0
Availab ility of Time for Project- Based Learnin g	4	4.5	4	4.5	7	8.0	44	50.0	29	33.0
Availab ility of School Resourc es for Real- World Learnin g	6	6.8	7	8.0	8	9.1	46	52.3	21	23.9

Source: Field Data (2026)

Table 1 presents teachers’ responses on student engagement in real-world projects and on the role of these projects in fostering students’ innovative skills.

2. Engagement of Students in Real-World Learning Activities

The findings show that 6 (6.8%) teachers strongly disagreed, 1 (1.1%) disagreed, 5 (5.7%) were undecided, 54 (61.4%) agreed, and 22 (25.0%) strongly agreed that they regularly engage students in real-world activities such as projects, case studies, and problem-solving tasks. Overall, 86.4% agreed or strongly agreed, compared with 7.9% who disagreed or strongly disagreed. An interview respondent reported that *“teachers are gradually shifting towards practical approaches, although workload and limited preparation time remain challenges”* (Interviewee H1, April 2026). This suggests that real-world learning is increasingly practiced, but consistent implementation requires adequate teacher preparation and institutional support. The findings are supported by Dullente and Namoco (2024), who found that real-world project-based learning improves students’ innovation and learning outcomes, and McNall et al. (2023), who linked real-world tasks with increased engagement and persistence.

3. Alignment of Real-World Tasks with Subject Content

One key indicator of student engagement in real-world projects is the extent to which real-world tasks align with subject content. The data show strong agreement among teachers regarding curriculum alignment. A total of 1 (1.1%) strongly disagreed, 1 (1.1%) disagreed, 6 (6.8%) were undecided, 40 (45.5%) agreed, and

40 (45.5%) strongly agreed that the real-world tasks they use are directly related to subject content. This means that 91.0% of teachers confirmed strong alignment between classroom content and practical tasks. In interviews, one of the respondents revealed that:

When teachers connect lessons to real-life situations, students understand concepts more deeply and can apply what they learn outside the classroom. This aligns with the competency-based curriculum, which emphasizes practical learning. However, continuous professional support is still needed to ensure that all teachers apply this approach effectively and consistently across subjects (Interviewee W1, April 2026)

This implies that although there is strong alignment between real-world tasks and subject content, the effectiveness of this alignment depends on continuous professional development, consistent supervision, and instructional support to ensure that all teachers implement it consistently and meaningfully. Without sustainable training, some teachers may apply project-based learning superficially, thereby reducing its impact on students' ability to develop innovative competencies. These findings correspond with Cao (2024), who found that structured and contextualized tasks enhance understanding and innovation by making learning more meaningful and learner-centred.

Similarly, Sah et al. (2024) argue that linking learning to real-world contexts strengthens creativity, communication, and critical thinking skills, which are essential components of innovation. The implication is that strengthening teacher training programs and improving instructional supervision would ensure consistent application of real-world learning approaches, thereby maximizing students' innovative skill development across all classrooms.

4. Application of Classroom Knowledge to Real-Life Situations

The findings show that 2 (2.3%) teachers strongly disagreed, 1 (1.1%) disagreed, 5 (5.7%) were undecided, 36 (40.9%) agreed, and 44 (50.0%) strongly agreed that they encourage students to apply classroom knowledge to real-life situations. Overall, 90.9% agreed or strongly agreed, while only 3.4% disagreed or strongly disagreed. An interview respondent explained that “competency-based reforms require teachers to help students apply knowledge practically, although examination-oriented teaching still limits this practice” (Interviewee D, May 2026). This suggests that despite strong policy emphasis on practical learning, classroom implementation remains constrained by examination pressure, limited monitoring, and teacher workload. The findings are supported by Ali (2025), who found that real-world application increases students' ownership and engagement, and

Oliveira (2025), who reported that connecting classroom learning with real-world problems enhances confidence, creativity, and innovation. From the perspective of Gardner's Multiple Intelligences Theory, applying knowledge through varied practical experiences can address learners' diverse strengths; therefore, continuous teacher training and instructional support are necessary to strengthen practical learning.

5. Availability of Time for Project-Based Learning

Adequate time is a crucial factor for the successful implementation of project-based learning activities. The results show mixed perceptions regarding time adequacy. A total of 4 (4.5%) strongly disagreed, 4 (4.5%) disagreed, 7 (8.0%) were undecided, 44 (50.0%) agreed, and 29 (33.0%) strongly agreed that they have sufficient time to use project-based learning during lessons. This indicates that 83.0% of teachers feel time is sufficient, while 9.0% disagree and 8.0% remain uncertain. Meanwhile, an interview respondent explained that:

Time allocation remains one of the biggest challenges in implementing project-based learning. Although teachers try to integrate projects into lessons, the syllabus is very broad, and examination pressure sometimes forces teachers to rush through the content. Nevertheless, we are encouraging teachers to plan

lessons carefully so that at least small projects can be included within the available time (Interviewee H2, April 2026).

The findings suggest that although most teachers perceive the time available for implementing Project-Based Learning (PBL) as generally adequate, curriculum demands and examination pressure may limit the depth of project activities. Consequently, teachers may simplify projects, reducing students' opportunities for inquiry, experimentation, collaboration, and reflection, which are important for developing innovative skills. This is consistent with Doly (2024), who found that insufficient instructional time constrains effective PBL implementation, and Haddad (2022), who emphasized the importance of careful planning and time management for successful PBL. From the perspective of Gardner's Multiple Intelligences Theory, adequate time is necessary to provide varied hands-on, collaborative, and reflective learning experiences that address learners' different strengths. Therefore, greater instructional flexibility and effective time management are needed to ensure meaningful project-based learning and comprehensive competency development.

6. School Resources Supporting Real-World Learning

The findings show that 6 (6.8%) teachers strongly disagreed, 7 (8.0%)

disagreed, 8 (9.1%) were undecided, 46 (52.3%) agreed, and 21 (23.9%) strongly agreed that school resources support real-world learning tasks. Overall, 76.2% agreed or strongly agreed, while 14.8% disagreed or strongly disagreed and 9.1% were undecided. An interview respondent added that “resource availability differs across schools, with some having laboratories and teaching materials while others lack basic equipment and reference materials” (Interviewee W2, May 2026). This suggests that unequal resource availability may affect the consistent implementation of PBL and students’ opportunities to develop creativity and problem-solving skills. The findings are consistent with Mbilingi (2024), who emphasized the importance of adequate learning resources for effective PBL, and Mcharo and Wandela (2024), who found that appropriate resources support students’ creativity and innovation. From Gardner’s Multiple Intelligences Theory, adequate resources provide opportunities for learners to engage different abilities through practical, spatial, logical, and collaborative activities; therefore, equitable resource provision is essential for effective real-world learning.

7. Students’ Response to Engagement in Real-World Projects in Fostering Innovative Skills

This section presents students’ responses on their engagement in real-world projects and how such

engagement contributes to the development of innovative skills. Their responses are shown in Table 2.

Table 2.
Students’ Responses on Student Engagement in Real-World Projects on Fostering Innovative Skills

Statement	Strongly Disagree		Disagree		Undecided		Agree		Strongly Agree	
	F	%	F	%	F	%	F	%	F	%
Working in Teams During Project-Based Learning Activities	2	2.0	4	4.0	0	0.0	53	53.5	40	40.4
Group Work and Generation of Creative Ideas	0	0.0	1	1.0	0	0.0	28	28.3	70	70.7
Equal Participation in Group Activities	0	0.0	2	2.0	0	0.0	44	44.4	53	53.5
Teamwork and Learning Engagement	1	1.0	3	3.0	0	0.0	40	40.4	55	55.6
Group Discussions and Generation of Original Solutions	1	1.0	4	4.0	0	0.0	33	33.3	61	61.6

Source: Field Data (2026)

Table 2 presents students’ responses on engagement in real-world projects and how teamwork in project-based learning fosters the development of innovative skills.

8. Working in Teams During Project-Based Learning Activities

Teamwork is a key element in enhancing collaboration and learning during project-based activities. The findings show that 2 (2.0%) of students strongly disagreed, 4 (4.0%) disagreed, 0 (0.0%) were undecided, 53 (53.5%) agreed, and 40 (40.4%) strongly agreed that they usually work in teams during project-based learning activities. This means that 93.9% of students confirmed active participation in teamwork, while only 6.0% expressed disagreement. This indicates that collaborative learning is highly practiced in schools. It suggests that students are frequently exposed to group-based learning environments, which help them develop cooperation, responsibility sharing, and communication skills that are essential for innovation development. An interviewee explained during an interview:

In our school, group work is now a common practice, especially during project-based learning lessons. Teachers encourage students to form groups and work together on tasks. However, some students still rely heavily on active members while remaining passive. We are encouraging teachers to monitor group participation more closely so that every learner contributes meaningfully. This approach is helping students gradually build teamwork and problem-solving skills, though

consistency remains a challenge in some classes (Interviewee H4, April 2026).

This implies that while teamwork is widely implemented, unequal participation within groups may still limit the full development of collaborative innovation skills. These findings align with McNall et al. (2023), who found that real-world collaborative tasks increase engagement and persistence, which are essential for creativity development. Similarly, Dullente and Namoco (2024) emphasized that teamwork in PBL enhances innovation skills when learners actively participate in tasks. This is further supported by Constructivist Learning Theory, which argues that knowledge is constructed through active participation, interaction, and shared meaning-making among learners. In addition, Gardner's Multiple Intelligences Theory supports this view by highlighting that group work activates different learner strengths, particularly interpersonal and linguistic intelligences; however, when participation is unequal, some learners' intelligences are underutilized, limiting their full development of collaborative and innovative skills.

9. Group Work and Generation of Creative Ideas

Group work plays a vital role in promoting creativity and idea generation among students. The results

reveal that 0 (0.0%) strongly disagreed, 1 (1.0%) disagreed, 0 (0.0%) were undecided, 28 (28.3%) agreed, and 70 (70.7%) strongly agreed that group work helps them think of new and creative ideas. This shows that 98.9% of students agreed, indicating a very strong positive perception. This suggests that collaborative learning environments significantly stimulate learners' creativity. When students interact, exchange ideas, and compare perspectives, they are more likely to generate innovative and original solutions. These findings align with Cao (2024), who found that collaborative, structured tasks enhance creativity and learner autonomy. Sah et al. (2024) also noted that teamwork in PBL strengthens innovation, communication, and critical thinking skills.

This is further supported by Constructivist Learning Theory, which emphasizes that learners build knowledge actively through social interaction, discussion, and shared experiences, where meaning is co-constructed rather than individually received. In addition, Gardner's Multiple Intelligences Theory supports this finding by highlighting that group work activates diverse learner intelligences, especially interpersonal, linguistic, and logical intelligences, allowing students to share ideas, reason collaboratively, and develop more creative and innovative solutions.

10. Equal Participation in Group Activities

Equal participation in group activities is essential for effective collaborative learning and skill development. The findings indicate that 0 (0.0%) students strongly disagreed, 2 (2.0%) disagreed, 0 (0.0%) were undecided, 44 (44.4%) agreed, and 53 (53.5%) strongly agreed that all group members are given a chance to contribute ideas, indicating that 97.9% agreed or strongly agreed. This suggests that most teachers promote inclusive group participation, although the interview revealed that *stronger students may sometimes dominate discussions while others remain passive* (Interviewee H5, April 2026). Therefore, teacher facilitation and assigning group roles are necessary to ensure balanced participation and support the development of communication, leadership, and innovation skills. This finding is supported by Oliveira (2025), who found that inclusive participation in real-world tasks enhances students' confidence and innovation, and Ali (2025), who emphasized that active engagement strengthens learners' ownership of learning. From the perspective of Constructivist Learning Theory, active interaction and shared knowledge construction enhance learning, while Gardner's Multiple Intelligences Theory suggests that inclusive group activities allow learners with different abilities to

contribute meaningfully to innovative learning.

11. Teamwork and Learning Engagement

Teamwork enhances students' active participation and learning engagement in classroom activities. The results show that 1 (1.0%) strongly disagreed, 3 (3.0%) disagreed, 0 (0.0%) were undecided, 40 (40.4%) agreed, and 55 (55.6%) strongly agreed that teamwork makes learning more interesting and engaging. This represents 96.0% overall agreement. This suggests that teamwork significantly increases student motivation and interest in learning activities. When learners work together, they experience more enjoyable and meaningful learning, which increases participation and persistence in tasks. Furthermore, the interview response showed that:

Students today respond better to interactive, group-based learning than to traditional lectures. When they work in teams, they become more active and interested in lessons. However, teachers must balance group activities with clear learning objectives so that engagement leads to actual skill development rather than just entertainment (Interviewee W3, May 2026).

This implies that engagement must be guided to ensure it results in meaningful learning outcomes. These findings align with McNall et al. (2023),

who found that real-world tasks increase motivation and engagement. Doly (2024) also noted that PBL improves student interest compared to traditional teaching methods. This is further supported by Constructivist Learning Theory, which emphasizes that learners actively construct knowledge through social interaction, collaboration, and meaningful participation in teacher-guided learning activities. In addition, Gardner's Multiple Intelligences Theory reinforces this finding by highlighting that teamwork engages multiple intelligences, particularly interpersonal, linguistic, and intrapersonal intelligences, enabling students to learn through communication, reflection, and collaboration, thereby increasing both engagement and deeper understanding.

12. Group Discussions and Original Solutions

Group discussions are important for promoting critical thinking and creativity among students. The findings show that 1 (1.0%) student strongly disagreed, 4 (4.0%) disagreed, 0 (0.0%) were undecided, 33 (33.3%) agreed, and 61 (61.6%) strongly agreed that group discussions help them generate original solutions, indicating that 94.9% agreed or strongly agreed. This suggests that group discussions are widely used and perceived as effective in helping students analyse problems, exchange

ideas, and develop innovative solutions. A Head of School explained that *“discussions enable students to think beyond textbooks and improve their solutions by challenging one another’s ideas, although some learners still require teacher guidance to participate effectively”* (Interviewee H3, April 2026). These findings are supported by Sah et al. (2024), who emphasized that communication and collaboration in project-based learning enhance creativity and problem-solving, and Zablan and Detera (2025), who found that group-based learning improves critical thinking and innovation. From the perspective of Constructivist Learning Theory, guided interaction and shared knowledge construction support learning, while Gardner’s Multiple Intelligences Theory suggests that group discussions engage interpersonal and linguistic abilities, enabling students to communicate, reason, and develop innovative solutions.

CONCLUSION

The study concludes that student engagement in real-world projects through Project-Based Learning (PBL) significantly contributes to the development of innovative skills among students in public secondary schools. The findings showed that students who participate in practical activities, teamwork, problem-solving tasks, and real-life projects develop creativity, critical thinking, collaboration, and the ability

to generate original solutions. However, challenges such as limited instructional time, inadequate learning resources, and differences in teacher preparedness affect the effective implementation of real-world learning activities. Therefore, while PBL provides an effective approach for enhancing innovation skills, its success requires adequate support, resources, and commitment from teachers, school leaders, and education stakeholders.

Recommendation

The study recommends that education authorities and school administrators should strengthen the implementation of Project-Based Learning by providing adequate teaching resources, improving teacher professional development, and creating supportive environments that allow sufficient time for practical learning activities. Teachers should be encouraged and trained to design meaningful real-world projects, facilitate effective teamwork, and ensure equal participation among students. By improving the conditions for project-based learning, public secondary schools can enhance students’ creativity, problem-solving abilities, and innovative skills necessary for addressing real-world challenges.

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